AD-A078 572 TASK GROUP 7.3 FPO SAN FRANCISCO 96333 F/G 18/3
OPERATION HARDTACK, ENIWETOK PROVING GROUND, MARCH-AUGUST 1958.(U)
1958

UNCLASSIFIED AEC-WT-115S NL

1 OF 3
AD
AD78572


8572

PHOTOGRAPH THIS SHEET

ADA078572

DTIC ACCESSION NUMBER

II

LEVEL

I

INVENTORY

Operation HARDTACK
Final Report March - August 1958
Report of Commander Task Group 7.3

DOCUMENT IDENTIFICATION

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

DISTRIBUTION STATEMENT

ACCESSION FOR
NTIS GRA&I
DTIC TAB
UNANNOUNCED
JUSTIFICATION
Per ltr. on file
BY
DISTRIBUTION /
AVAILABILITY CODES

DIST	AVAIL AND/OR SPECIAL	
A		

DISTRIBUTION STAMP

DDC
RECEIVED
JAN 2 1980
D

DATE ACCESSIONED

79 12 18 575

DATE RECEIVED IN DTIC

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-DDA-2

193650

DTIC FORM OCT 79 70A

DOCUMENT PROCESSING SHEET

special UNCLASSIFIED

COPY NO. 75

OPERATION HARDTACK

ENIWETOK PROVING GROUND

MARCH - AUGUST 1958

FINAL REPORT

[redacted]

UNCLASSIFIED

Classification (Cancelled) (~~Changed to~~)
By Authority of Director, DNA
By R.G.Nelson Ch TSCC/DNA Date 28 Dec 1979

COMMANDER TASK GROUP 7.3

~~Statement A~~
Approved for public release;
Distribution unlimited. [redacted]

UNCLASSIFIED

[redacted]

This document consists of 280 pages
No. 75 of 350 copies, Series A

1

REPORT OF COMMANDER

TASK GROUP 7.3

[redacted]

TASK GROUP 7.3
Fleet Post Office
San Francisco, California

FF3/7.3/10:deh
A9
Ser: 0084
3 November 1958

From: Commander Task Group 7.3
To: Commander Joint Task Force SEVEN

Subj: Report of Operation HARDTACK

Ref: (a) CJTF SEVEN ltr J-3/319.1W of 3 March 1958

Encl: (1) Copy No's. 1, 2, and 3 of CTG 7.3 Final Report of Operation HARDTACK

1. In accordance with reference (a), enclosure (1) is furnished herewith.

2. The initial distribution of copies of this report is indicated below. Requests for additional copies should be made to Commander Task Group 7.3, Naval Gun Factory, Washington 25, D.C. Further distribution of this report will be made to ships and units assigned to Task Group 7.3 for the next operation in the Eniwetok Proving Ground.

D. M. TYREE

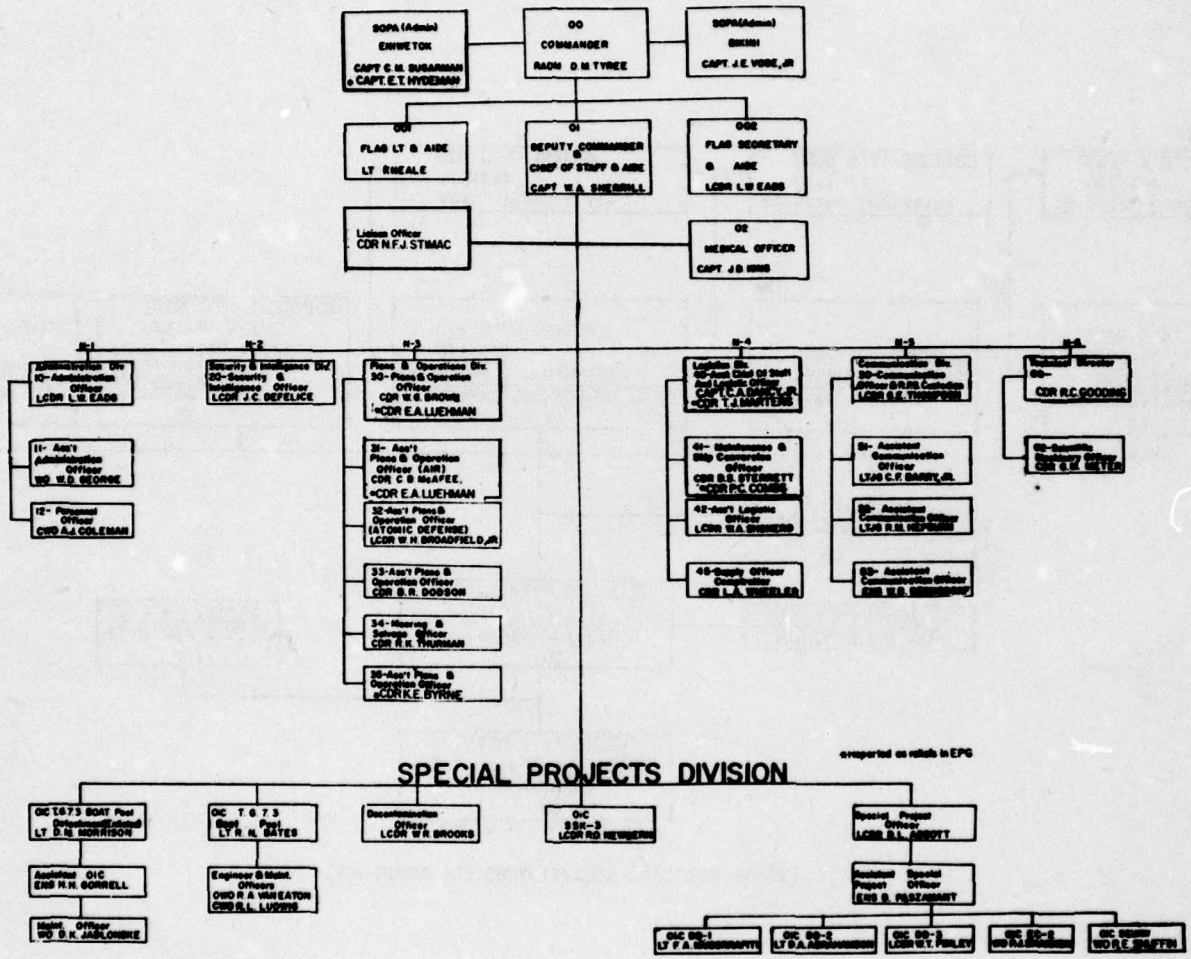
DISTRIBUTION	Copy No's.
CJTF SEVEN	1-2-3
CTG 7.1	4-5
CTG 7.2	6-7
CTG 7.4	8-9
CTG 7.5	10-11
CNO (OP-36)	12-16
CMC	17-18
BUSHIPS	19-20
CINCPAC	21-22
CINCPACFLT	23-24
COMFIRSTFLT	25
COMWESTSEAFRON	26
COMHAWSEAFRON	27
COMFOURTEEN	28
COMELEVEN	29
COMTWELVE	30
PRES, NAVWARCOL	31-33
COMSTS	34
COMSTSPACAREA	35
COMSUBPAC	36
COMNAVAIRPAC	37-38
COMPHIBPAC	39-40
COMSERVPAC	41-42
COMCRUDESPAC	43-44
COMTRAPAC	45
COMPHIBTRAPAC	46
COMPHIBGRUEASTPAC	47
COMOPDEVFOR	48-49

DISTRIBUTION	Copy No's.
COMFAIRWING TWO	50
CO, NAVSTA, KWAJ	51
CO, NRDL, SFRAN	52
CG FMFPAC	53
CG AIRFMFPAC	54
CG THIRD MAW	55
CO, MAG (HR-36)	56
C/S ARMY	57
DC/S PLANS & RESEARCH (ARMY)	58
DCSOPS USA	59
DCSLOG USA	60
C/S USAF	61
DC/S OPERATIONS USAF	62
AFOAT	63
AFOAT-1	64
COM, ARDC	65
COM, MATS	66
COM, AFSWC	67
CHAIRMAN, AEC	68
DMA, AEC	69
DIV OF SECURITY, AEC	70
DIV, BIOMED, AEC	71
DIV OF CLASSIFICATION	72
AOO	73
NYOO	74
CHIEF, AFSWP	75
CO, FC, AFSWP	76
DIR, SIO	77

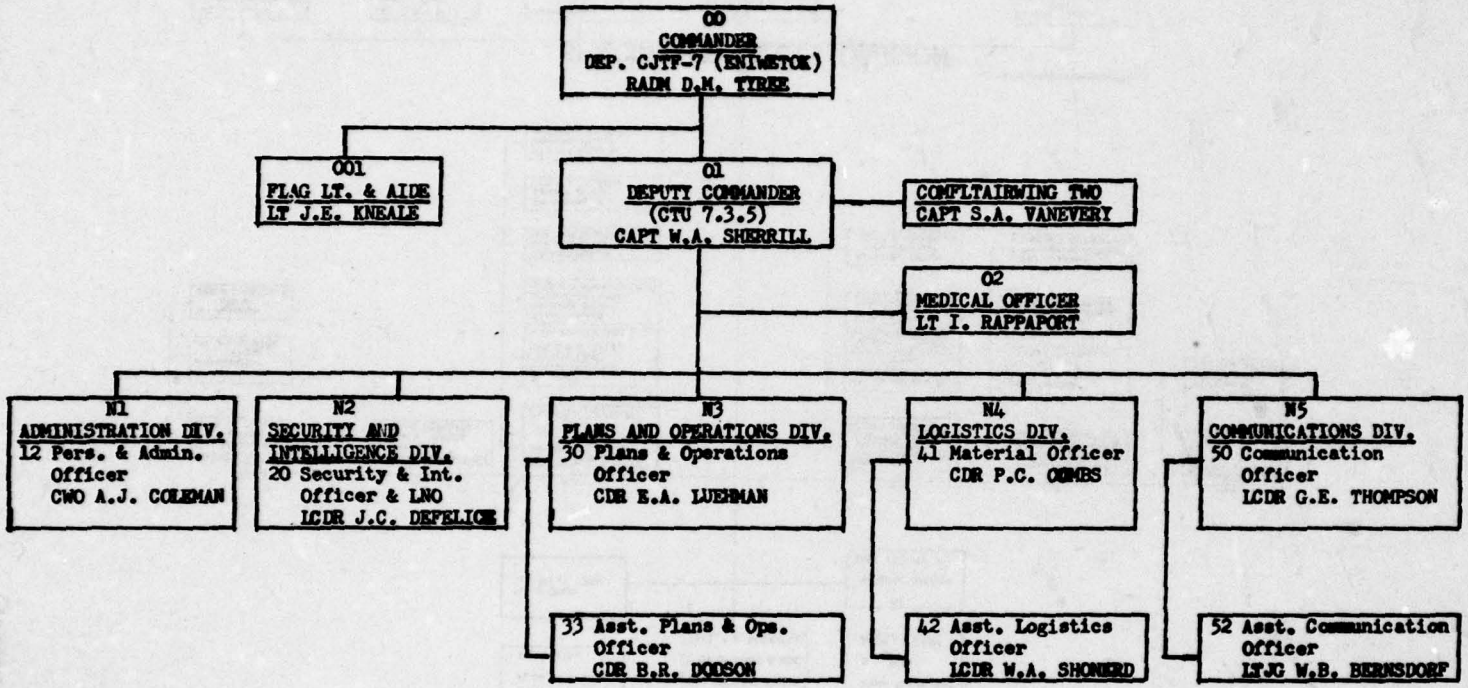
[redacted]

[redacted]

TASK GROUP 7.3 ORGANIZATION



TASK GROUP 7.3 ORGANIZATION (NEWSREEL PHASE)



CONTENTS

CHARTS, DIAGRAMS AND TABLES

COMMANDER TASK GROUP 7.3

COMMANDER'S REPORT

Operation HARDTACK, a Joint Atomic Energy Commission-Department of Defense test series of nuclear weapons and devices was conducted by Commander Joint Task Force SEVEN at the Eniwetok Proving Ground during the spring and summer of 1958. The Chief of Staff of the United States Air Force was the Executive Agent of the Joint Chiefs of Staff for the conduct of the test series. The Naval participation in this Operation was provided by Task Group 7.3.

Thirty-five detonations took place at Eniwetok, Bikini and Johnston Island. A listing of all shots is appended to this section and is given limited distribution.

FORCES

The peak strength of Task Group 7.3 consisted of 6,822 personnel. A ship rotation policy increased the number of Naval personnel who were able to receive indoctrination and training in nuclear weapon tests to a total of 9,178.

The units assigned to the Naval Task Group to carry out the assigned tasks and to render support to the Joint Task Force were as follows:

Ships	52
Aircraft	33
Small Craft	38
Helicopters	15
Service Craft	13

A listing of the above forces and the periods of operations in HARDTACK is appended at the conclusion of this section.

DESCRIPTION OF EVENTS AND SUPPORT RENDERED

In the main, operations in the Eniwetok Proving Ground may be classified under the broad headings, Diagnostic Shots, and Weapons Effects Tests; of these there were 28 primarily diagnostic, 5 primarily effects tests consisting of 2 underwater shots, 2 rocket shots, and 1 balloon shot and 2 shots equally

important from the developmental and effects view. The Naval support rendered for certain of these events is described below:

a. Diagnostic Shots.

Except for three large weapons shots which required pre-shot evacuation of aircraft or personnel the Naval support for the twenty-eight diagnostic shots tended toward a routine pattern. In the main, this support consisted of daily air search of the danger area, helicopter transportation at Bikini, standing by for emergency evacuation, monitoring aircraft at Bikini from the BOXER or DDR CIC, and furnishing weather data from three separate destroyer locations. Because of the attendant delays due to weather peculiar to these tests, and the number of events, ships and aircraft were in a ready status or engaged in operations a considerable portion of the time.

b. Underwater Shots - WAHOO and UMBRELLA

These events were of particular importance in the magnitude and unusual aspect of their scope. Twelve operating ships, four target array ships, fourteen service craft, twelve small craft and five hundred seventy-one personnel attached to Task Group 7.3 units were required solely for these particular events in addition to other units assigned for HARDTACK.

Support included the laying of deep sea moorings, operation of main machinery plants aboard the target DDs, diving in "hot water" for instrumentation recovery, unique recovery of floating objects, and practical decontamination of target array units.

The laying of the deep water moors was an extremely critical phase of the WAHOO event. Any future deep water moorings will profit by the techniques and experience gained by the mooring element. A combination of ARS (Salvage Ship), ATF (Seagoing Tug) and YTB (Harbor Tug) were used to accomplish the moorings. The ATF (type) was not as advantageous as expected and an ATA (Ocean Tug Auxiliary) with more maneuverability could have served to better purpose.

For UMBRELLA, Commander Task Group 7.3 was given the responsibility for the successful accomplishment of the early recovery missions. This assignment represented a departure from that of WAHOO in which CTG 7.3 was assigned

an assisting role to the scientific task group. The recovery missions for UMBRELLA were highly successful and it is expected that the scientific data gathered will greatly benefit knowledge in this field.

c. NEWSREEL Shots - TEAK and ORANGE.

Additional requirements for ships and aircraft were submitted to CNO for the NEWSREEL Phase. The gratifying and usual cooperative assistance of Commander in Chief, Pacific Fleet and his type commanders made these units available in timely fashion. Additional units from the EPG were furnished for NEWSREEL even though simultaneous operations occurred. This division of forces was accomplished by a reassignment of ship tasks, by forming helicopter and patrol plane squadron detachments, and by placing the Task Group 7.3 Administrative Headquarters ashore at Parry Island (in lieu of the BOXER).

For these events, Commander Task Group 7.3 furnished shipboard facilities for pre-shot evacuation, ship-shore helicopter support, air search of a 520 mile radius sea area, lift of trailers, vans and equipment from the EPG and Pearl to Johnston, post-shot recovery of nose cones, and shipboard facilities for reception of instrumentation data.

d. YUCCA Shot.

For the YUCCA event the BOXER provided the shipboard platform for launching the YUCCA balloon. The technique utilized was highly successful and no difficulties were encountered in this phase.

U.S.S. BOXER

Within the general support rendered by the Navy Task Group the role played by the BOXER deserves special mention. She performed many functions which in REDWING had been assigned to three ships; namely, the ESTES (AGC), CURTISS (AV) and BADOENG STRAIT (CVE).

A partial listing of its utilization is tabulated:

CTG 7.3 Flagship
Air Operations Center for BIKINI
Evacuation Ship for BIKINI
Refueling ship for DDs
Weather Ship
Ready Supply Ship to smaller units

Special recovery unit for UMBRELLA

Procurement Activity for HMR(L) 361

During the NEWSREEL Phase the USS MONTICELLO (LSD-35) and USS BENNER (DDR-807) assumed many tasks previously assigned to the BOXER in the EPG. Although all of the above tasks were satisfactorily accomplished by the latter ships, the use of an aircraft carrier to perform these tasks on a day to day basis is considered more effective and efficient.

MISSIONS

The missions and tasks assigned to the Naval Task Group indicate the nature of the support rendered and are appended. Certain tasks noteworthy of comments are described below:

a. Conduct Search and Provide Security of the Danger Area.

This task was assigned to VP-28 in the EPG and to COMFAIRWING TWO at Johnston Island. All unauthorized shipping was kept clear. The PHOENIX intentionally entered the EPG danger area. After the Master was apprehended by a Coast Guard Officer the PHOENIX was escorted to Kwajalein by Deputy CTG 7.3 aboard the destroyer COLLETT.

A few merchant ships and fishing vessels were found in the danger area and left expeditiously when notified to do so by message drop.

All shipping routed to pass within 700 miles of Eniwetok or Bikini and 500 miles of Johnston Island was controlled by OCAs (Operational Control Authorities) in accordance with CINCPACFLT's procedures. All support ships headed for Eniwetok or Bikini were routed in a safe manner and in addition were chopped to CTG 7.3 at 700 miles distance from Eniwetok and 500 miles from Johnston Island. The T-LSTs and M/V ALOTO under the operational control of CUSATG 7.2 and CTG 7.5 respectively were not subject to the above procedures and during the early weeks of HARDTACK sailed through the danger area without receiving CTG 7.3's routing instructions. Although adequate procedures were established with the cooperation of CUSATG 7.2 and CTG 7.5 movement control responsibility of such ships by CTG 7.3 is considered preferable.

b. Furnish a shipboard capability for Emergency Evacuation.

An APA at Eniwetok and the USNS AINSWORTH at Bikini were assigned the primary tasks of furnishing this capability in conjunction with other large

[redacted]

Naval units available off Parry Island, Eniwetok. At this latter location and also at Bikini an LST type was found to be the ideal ship for evacuating if fallout hazard should require it, because an LST could be beached and had ample protected space. During HARDTACK the movements of the T-LSTs were determined by material lift requirements and therefore these ships could not always be assigned for evacuation.

c. Provide shipboard facility for Pre-shot Evacuation.

Pre-shot evacuation of personnel was required for two events at Bikini and two at Johnston Island. Two events at Bikini and one at Eniwetok required pre-shot evacuation of helicopters. It is noteworthy that when the BOXER departed for NEWSREEL the USS MONTICELLO was utilized to evacuate the nine helicopters remaining at Bikini. The versatility of this type ship for operations in the EPG cannot be over-emphasized; the modern, fast LSD provides suitable Flag accommodations, is capable of moving shot barges between atolls and can lift boat pool personnel, craft and trailers. Some additional communication equipment, easily installable, is required for its use as an alternate Flagship.

The AINSWORTH (T-AP) was used for two pre-shot total evacuations and several partial evacuations of up-atoll islands at Bikini and proved more than adequate for this purpose. It provided an alternate command post, gave an emergency evacuation capability and provided passenger and cargo lift to and from the EPG. However, in spite of these services it is felt that the necessity for a T-AP is worthy of restudy. Protected bunker facilities ashore may be more economical than continuing use of large ships for this purpose.

d. Provide Weather Information and Data.

Three DDs and one DDR were assigned for HARDTACK and normally three DDs and the BOXER supplied weather information prior to each event. Although the destroyers were equipped with high altitude rockets for sampling at high altitudes, and with projectiles for quick sampling at medium altitudes the weather officers gradually relied more and more upon balloon soundings. With the BOXER's departure for NEWSREEL a shore weather station was established at Bikini. It is considered that the use of two shore based weather stations at NAN and two at FRED would have been more economical in manpower than the use of DDs to supplement the shore based facilities. DDs should be used where a shore

[redacted]

station cannot be established. In connection with installations ashore it is understood that simultaneous tracking by two closely placed shore stations is feasible when the bearings are a sufficient distance apart and also if the frequency settings are properly controlled.

MORALE

The morale of Task Group 7.3 was high but suffered at times due to continuing and arduous operations which afforded little if any time for recreation.

The recreation facilities were limited and remote at Eniwetok. At this location the considerable number of ships and the tenor of operations precluded a satisfactory boat schedule until the underwater events were concluded. At Bikini the recreation facilities were conveniently located and the fewer number of personnel located there enjoyed them to advantage.

The "Ham Station" at Bikini was appreciated by all personnel and maintained schedules with the West Coast, Hawaii, and Washington, D.C. At Eniwetok a separate Ham Station was not readily accessible to shipboard personnel since the stations were located at Parry and Eniwetok Islands, whereas the main Navy Recreation Area was maintained at Japtan Island. Security badge requirements precluded access for most shipboard personnel to the Parry areas except for transit of personnel along the beach road.

COMMAND AND ADMINISTRATION

The command of Task Group 7.3 involved the control of three widely separated and distinct Task Units at Eniwetok, Bikini and Johnston Island.

Two separate and integral Communication Centers were established in providing CTG 7.3 with complete files of all traffic. One Center was in the BOXER, normally at Bikini and later at Johnston Island, and the other at Parry Island, Eniwetok inside the administrative compound of Joint Task Force SEVEN.

The Deputy Commander and Chief of Staff, Task Group 7.3, was a key figure in the delineation of control in that he had the authority and overall knowledge to direct a task unit separated from the Commander's immediate presence. For the NEWSREEL Phase the Commander Task Group 7.3 and Deputy for Navy, CJTF-7 remained in the EPG as CJTF-7 Eniwetok. In this situation the Deputy CTG 7.3 exercised active control of the Naval units assigned to the NEWSREEL Phase.

A reconsideration of the command aspects of HARDTACK, of the considerable Naval forces assigned, the separation of these forces, and the fact that

[redacted]

Commander Task Group 7.3 was also assigned additional duty as Deputy Commander Joint Task Force SEVEN not only reaffirms the requirement for a Deputy CTG 7.3 in future operations but also suggests that the Deputy for Navy, CJTF-7 billet should be distinct from the Commander Task Group 7.3 billet. The Deputy (Navy) CJTF-7 is required to advise the CJTF-7 on Naval matters, to make objective recommendations, and to perform assigned tasks which require considerable detachment from the Task Group 7.3 Flagship. It is concluded that a Flag Officer as Deputy (Navy) CJTF-7 should be assigned for future operations of a similar nature and that two officers, both of the rank of Captain, USN should be assigned as CTG 7.3 and D/CTG 7.3. During the interim period the billets of Deputy (Navy) CJTF-7 and CTG 7.3 should be integrated.

The detailed report of Task Group 7.3's part in Operation HARDTACK is covered in succeeding sections. The report is intended primarily to serve as a guide to succeeding Staff Officers in acquainting them with the requisite procedures and details in planning and conducting an operation of a similar nature.

Commander Task Group 7.3's conclusions and recommendations are as follows:

CONCLUSIONS

1. That the number of Naval personnel and units involved in HARDTACK conveys the tremendous scope of Naval support required for nuclear test operations conducted in a two year cycle.
2. That the aircraft carrier (CVS type) is necessary and justified for similar test operations of this nature.
3. That the missions assigned to the Naval Task Force reveal the versatility of the Naval Task Group.
4. That all missions and tasks assigned were successfully accomplished.
5. That the unusual demands for additional Naval support for NEWSREEL and an extended schedule of events in the EPG were met in timely fashion by the keen understanding and gratifying cooperation of CINCPACFLT and Type Commanders.
6. That all ships operating in the EPG should be placed under the operational, or at the minimum, movement control of CTG 7.3 to insure positive control for safety purposes.
7. That an LST type ship is ideal for emergency evacuations of personnel for brief periods because of its beaching capability and capacity.

[redacted]

8. That the LSD type ship was invaluable throughout all phases of the operation.

9. That other means for protecting personnel rather than ships evacuation for planned evacuation events should be investigated as a matter of economy. Routine planned evacuation requires greater lift capacity than emergency evacuation.

10. That the aircraft carrier assigned should not be assigned permanent tasks which limit her versatility for more demanding assignments; other units should be fitted out, so that they can assume the aircraft carrier tasks for brief periods as required. For example, a DDR is valuable as an alternate AOC ship.

11. That shore based weather stations where land is available are usually more economical than DDs for the purpose of balloon weather soundings, using DDs to man only the ocean stations.

12. That the salvage ship (ARS) in combination with the smaller surveying tug (ATA) is the ideal combination for laying deep sea moors.

13. That the Naval Task Group is well organized and equipped for assuming the responsibility for post-shot recovery of objects in the water.

14. That a Deputy Task Group Commander is vital for operations involving more than one atoll.

15. That the Deputy CJTF-7 Navy and Commander Task Group 7.3 billets involve functions and responsibilities which might well be separate.

16. That morale of the Navy Task Group was satisfactory; that the "Ham Station" at Bikini was the greatest single factor which contributed to high morale in that area.

17. That an important improvement in liberty opportunities for forces afloat would be attained if the convenient facilities of Parry Island were made available to shipboard personnel for swimming, snacks, and drinks.

18. That more "ham stations" were warranted for the Navy Task Group because of the considerable personnel attached, and the lesser number of recreation facilities ashore available to Task Group 7.3 ships.

19. That weather has an important effect upon the successful laying of the outside moors; experience indicates the best weather for laying moors commences in late June.

20. That the need for the T-AP be re-evaluated prior to the next Operation to ascertain whether a cheaper method to satisfy the need cannot be provided.

[redacted]

21. That assignment of all ships to the Operation from Pacific Fleet resources has the disadvantage of limiting valuable nuclear testing experience to Pacific Fleet personnel.

RECOMMENDATIONS

1. That an experienced group of officers be retained on the Staff of Commander Task Group 7.3 during the interim period to plan the Naval participation in nuclear test operations in the Pacific.

2. That an aircraft carrier (CVS) or similar type be assigned for future operations.

3. That the policy of rotating ships during the Operation be adopted and followed where practicable with due regard to stabilization of personnel prior to and during deployment.

4. That all ships entering or operating in the EPG Danger Area be placed under the operational or movement control of CTG 7.3.

5. That an LST be assigned as Evacuation Ship in lieu of an APA where emergency evacuation of personnel is the sole prime task.

6. That means other than ship evacuation of personnel be investigated for insuring safety of personnel during and following an event.

7. That a DDR be fitted out to assume AOC duties at Bikini when the aircraft carrier is otherwise engaged.

8. That at least one fast LSD be assigned.

9. That shore based weather stations be established capable of taking weather balloon soundings at as frequent intervals as necessary leaving DDs to man only the required ocean stations.

10. That a ham station be sponsored by the Navy Task Group at Camp Parsons, Japtan Island or at a location near the beach at Parry Island if liberty for Navy personnel is permitted on Parry.

11. That for any future underwater shots at Eniwetok the laying of moors should commence in late June and the "Shots" fired in late July or early August in order that advantage may be taken of suitable weather.

12. That consideration be given to assigning some of the required ships from the Atlantic Fleet as well as the Pacific Fleet.

[redacted] [redacted]

LIST OF EVENTS

ENIWETOK

DATE	EVENT	PLACE DETONATED	TYPE BARGE TOWED, ETC.
6 May	CACTUS	RUNIT (YVONNE)	SURFACE, CONCRETE SHIELD
12 May	BUTTERNUT	RUNIT (YVONNE)	BARGE
13 May	KOA	TEITERIPUCCHI (GENE)	SURFACE WATER TANK
16 May	WAHOO	OCEAN, POKON (IRWIN)	BELOW SURFACE - 500' IN 3200' OF WATER
21 May	HOLLY	RUNIT (YVONNE)	CONCRETE SHIELD, PINEX BARGE
26 May	YELLOWWOOD	ENGEBI (JANET)	BARGE
27 May	MAGNOLIA	RUNIT (YVONNE)	PINEX BARGE
30 May	TOBACCO	ENGEBI (JANET)	BARGE
3 Jun	ROSE	RUNIT (YVONNE)	BARGE
9 Jun	UMBRELLA	LAGOON MUI (HENRY)	LAGOON BOTTOM
15 Jun	WALNUT	ENGEBI (JANET)	BARGE
18 Jun	LINDEN	RUNIT (YVONNE)	BARGE
28 Jun	ELDER	ENGEBI (JANET)	BARGE
29 Jun	OAK	4 mi. so. BAGALLUA (ALICE)	LCU
2 Jul	SEQUOIA	RUNIT (YVONNE)	LCU
6 Jul	DOGWOOD	ENGEBI (JANET)	LCU
14 Jul	SCAEVOLA	RUNIT (YVONNE)	BARGE
18 Jul	PISONIA	RUNIT (YVONNE)	LCU
23 Jul	OLIVE	ENGEBI (JANET)	LCU
27 Jul	PINE	ENGEBI (JANET)	BARGE
6 Aug	QUINCE	RUNIT (YVONNE)	SURFACE BURST
18 Aug	FIG	RUNIT (YVONNE)	SURFACE BURST

BIKINI

28 Apr	YUCCA	AIR BURST	FREE BALLOON
12 May	FIR	NAMU (CHARLIE)	BARGE, SHRIMP CRATER
22 May	NUTMEG	ENINMAN (TARE)	BARGE
31 May	SYCAMORE	NAMU (CHARLIE)	BARGE, SHRIMP CRATER

DATE	EVENT	PLACE DETONATED	TYPE BARGE TOWED, ETC.
11 Jun	MAPLE	ROURIKKU (FOX)	BARGE 1200' OFF SHORE
15 Jun	ASPEN	NAMU (CHARLIE)	BARGE, SHRIMP CRATER
28 Jun	REDWOOD	ROMURIKKU (FOX)	BARGE
29 Jun	HICKORY	ENINMAN (TARE)	BARGE
3 Jul	CEDAR	NAMU (CHARLIE)	BARGE
12 Jul	POPLAR	NAMU (CHARLIE)	BARGE, SHRIMP CRATER, NO SHIELD
22 Jul	JUNIPER	ENINMAN (TARE)	PINEX BARGE, ZUNI CRATER, NO SHIELD
		JOHNSTON ISLAND	
31 Jul	TEAK	LAUNCHED SW FROM EAST END JOHNSTON ISLAND	PLANNED BURST ALTITUDE 250,000' (UHA) VIA REDSTONE
11 Aug	ORANGE	LAUNCHED SW FROM EAST END JOHNSTON ISLAND	PLANNED BURST ALTITUDE 125,000' (VHA) VIA REDSTONE

[redacted]

The Navy Forces assigned for direct support of Joint Task Force SEVEN in Operation HARDTACK were as follows:

NAME	QUANTITY	PERIOD IN EPG	REMARKS
USS BOXER (CVS-21)	1	FEB 58-AUG 58	Flagship
USS COMSTOCK (LSD-19)	1	DEC 57-APR 58	Additional LSDs provided for opportune lift of craft for CJTF-7 to and from the EPG.
USS TORTUGA (LSD-26)	1	FEB 58-APR 58	
USS BELLE GROVE (LSD-2)	1	APR 58-AUG 58	
USS MONTICELLO (LSD-35)	1	APR 58-AUG 58	
T-LST 618	1	SEP 57-DEC 58	Furnished and funded by Navy.
T-LST 664	1	SEP 57-OCT 58	Op Control of CTG 7.3 for evacuation only.
USS RENVILLE (APA-227)	1	APR 58-MAY 58	
USS MAGOFFIN (APA-199)	1	MAY 58-JUN 58	APAs relieved each other on station.
USS NAVARRO (APA-215)	1	JUL 58-AUG 58	
USS FLOYD B. PARKS (DD-884)	1	MAR 58-MAY 58	DD Division relieved on station in May.
USS JOHN R. CRAIG (DD-885)	1	MAR 58-MAY 58	
USS ORLECK (DD-886)	1	MAR 58-MAY 58	
USS PERKINS (DDR-877)	1	MAR 58-MAY 58	
USS MANSFIELD (DD-728)	1	MAY 58-AUG 58	
USS COLLETT (DD-730)	1	MAY 58-AUG 58	
USS DEHAVEN (DD-727)	1	MAY 58-AUG 58	
USS BENNER (DDR-807)	1	MAY 58-AUG 58	
USS EPPERSON (DDE-719)	1	AUG 58-AUG 58	
USS CHANTICLEER (ASR-7)	1	APR 58-MAY 58	
USS GRASP (ARS-24)	1	MAR 58-JUN 58	
USS BOLSTER (ARS-38)	1	MAR 58-JUN 58	
USS MOCTOBI (ATF-105)	1	FEB 58-JUN 58	
USS ARIKARA (ATF-98)	1	MAR 58-AUG 58	
USS TAKELMA (ATF-113)	1	MAR 58-AUG 58	
USS MUNSEE (ATF-107)	1	MAR 58-JUN 58	
USS CHOWANOC (ATF-100)	1	MAR 58-JUN 58	
USS CREE (ATF-84)	1	APR 58-AUG 58	

[redacted]

[redacted]

NAME	QUANTITY	PERIOD IN EPG	REMARKS
USS HOOPER ISLAND (ARG-17)	1	APR 58-JUN 58	
USS CACAPON (AO-52)	1	MAR 58-AUG 58	
USS LANSING (DER-388)	1	MAY 58-JUN 58 JUL 58-AUG 58	
USS JOYCE (DER-317)	1	MAY 58-JUN 58	
USS SILVERSTEIN (DE-534)	1	SEP 58-SEP 58	Assigned for 3 week Period.
USS REHOBOTH (AGS-50)	1	APR 58-JUN 58	
USS LAWRENCE COUNTY (LST-887)	1	MAY 58-JUN 58	
USNS AINSWORTH (T-AP-181)	1	APR 58-JUL 58	
USS BONITA (SSK-3)	1	APR 58-JUN 58	Assigned to Target Array.
USS KARIN (AF-33)	1	MAR 58-AUG 58	
USS MERAPI (AF-38)	1	MAR 58-AUG 58	Operated between Pearl Harbor, T.H. and EPG.
USS COGSWELL (DD-651)	1	JUL 58-AUG 58	
USS SAFEGUARD (ARS-25)	1	JUL 58-AUG 58	
USS HITCHITI (ATF-103)	1	JUL 58-AUG 58	Mission Basis.
USS TILLAMOOK (ATF-102)	1	JUL 58-AUG 58	
AOG Vessels	5	MAR 58-AUG 58	Furnished POL point to point supply.
DD	3	APR 58-JUN 58	Target Array.
EC-2	1	APR 58-JUN 58	Target Array.
Patrol Planes	16	APR 58-AUG 58	Billeted at Kwajalein.
UF Aircraft	3	DEC 57-AUG 58	Billeted at Kwajalein.
Patrol Aircraft (WV-2)	5	JUL 58-AUG 58	Newsreel.
Patrol Aircraft (P2V)	6	JUL 58-AUG 58	Newsreel.
Helicopters (HRS-1)	15	JAN 58-AUG 58	Bikini and Newsreel.
YFNB	1	APR 58-JUN 58	Target Array.
YFNB	1	MAR 58-AUG 58	Boat Pool Support.
YTBs	2	FEB 58-JUN 58	
LCM	33		
LCU	3		
LCPR	1		
LCPL	3		

[redacted]

THE CONTINUING MISSIONS AND TASKS ASSIGNED TO COMMANDER TASK GROUP 7.3 WERE BRIEFLY AS FOLLOWS:

1. Conduct search and provide security of the Danger Area.
2. Provide aircraft for RadSafe Reconnaissance and barrier patrols as required.
3. Furnish a shipboard capability for emergency evacuation of Eniwetok Atoll, Bikini Atoll and off-atoll stations as may be necessary.
4. Assist CTG 7.4 in SAR.
5. For particular events provide shipboard facilities at Bikini for pre-shot evacuation of personnel, boats and other craft and helicopters.
6. Provide afloat facilities at Bikini for use as an AOC.
7. Furnish inter-atoll water transportation for special weapons, devices, shot barges and other craft.
8. Provide to the Joint Task Force intra-atoll helicopter transportation at Bikini.
9. Provide ship-shore transportation at both atolls utilizing small craft.
10. Provide weather information and data to the Joint Task Force SEVEN Weather Central at designated times.
11. Furnish Marine Security Guards as required for guarding of weapons and devices.
12. Conduct and assume responsibilities for all diving operations in the EPG.
13. Furnish platforms afloat for scientific projects as directed for individual events.
14. Conduct post shot recovery operations as required to retrieve objects from the water for diagnostic and effects measurements. (Effective after WAHOO)
15. Conduct salvage operations as necessary.

SPECIAL MISSIONS ASSIGNED FOR WAHOO EVENT WERE AS FOLLOWS:

1. Assist in film packet recovery as required.
2. Place and recover all moorings.
3. Place and recover all targets.
4. In connection with the underwater detonation, position buoys from which

[redacted] [redacted]

weapons are suspended, lower weapons and electrical cable, and collect radiochemical water samples.

5. Furnish ship to shore transportation to the target array.

SPECIAL MISSIONS ASSIGNED FOR UMBRELLA EVENT WERE AS FOLLOWS:

1. Provide the afloat RadSafe and Decontamination Center.

2. Conduct post-shot recovery operations as required to recover gauge strings, captive balloons, rocket cannisters, coracles, test animals, and sample collectors.

3. By use of surface unit, obtain radiochemical water samples as required.

4. Position buoys from which weapon is suspended; lower weapon and electrical cable.

5. Coordinate and conduct all JTF-7 approved diving in the EPG.

6. Place and recover all moorings.

7. Place and recover all targets.

8. Furnish ship to shore transportation to the target array.

SPECIAL MISSIONS ASSIGNED IN CONNECTION WITH THE YUCCA EVENT WERE AS FOLLOWS:

1. Properly position the USS BOXER at shot time.

2. Furnish shipboard facilities of the USS BOXER for launching the YUCCA balloon.

3. Furnish shipboard facilities to track the balloon.

4. Furnish last minute area weather data by means of RAWIN balloon soundings and HASP rockets.

[redacted] [redacted]

SECTION 1

ADMINISTRATION AND PERSONNEL

1.1 ADMINISTRATION

1.1.1 ORGANIZATION AND RESPONSIBILITIES

The organization of the Staff subsequent to Operation REDWING until deployment to the Eniwetok Proving Ground evolved through three major phases, i.e., interim, planning and operational. The personnel allowance during the interim period was approximately one-half the operational allowance. This allowance proved adequate for carrying out the mission and responsibilities assigned by CJTF SEVEN for the interim period of roll-up and pre-planning for Operation HARDTACK. A nucleus of Staff members retained from Operation REDWING provided a group of experienced personnel for the planning of Operation HARDTACK.

The organization of the Staff for the first part of the operational phase of HARDTACK (15 March to 25 June 1958) consisted of a split Staff. One part was in the Flagship (BOXER) headed by the Deputy Commander and the other was at Eniwetok Atoll (ELMER) as the 7.3 Staff Detachment. The Eniwetok element was headed by the Logistics Officer in the capacity of Senior Naval Officer Present, 7.3 Staff Detachment. The Commander Task Group 7.3 was in overall command. The Deputy Commander also functioned as Chief of Staff of the entire Staff and exercised overall responsibility for Staff performance and execution of duties.

During the above period split-staff responsibilities were assigned as set forth below:

a. Primary CTG 7.3 administrative responsibilities and command files were administered by Staff in BOXER.

b. Primary Task Group 7.3 surface ship matters were handled by the Staff Detachment ENIWETOK.

c. Primary Task Group 7.3 aircraft matters were handled by Staff in BOXER.

d. Primary ENIWETOK matters were handled by the Staff

(1.1.1.d Cont'd.)

Detachment ENIWETOK. Local administrative matters were handled by SOPA (ADMIN) ENIWETOK.

e. Primary BIKINI matters were handled by the Staff in BOXER. Local administrative matters were handled by SOPA (ADMIN) BIKINI.

f. Primary Logistic functions were handled by the Staff Detachment ENIWETOK.

On 25 June 1958, the CTG 7.3 Administrative Headquarters was transferred from the Flagship (BOXER) to Building 221 at ELMER. On 13 July the Deputy Commander in company with five other officers and four enlisted men boarded BOXER at Johnston Island as Commander of a Task Unit for the Navy support of the NEWSREEL phase of Operation HARDTACK. The Commander Task Group 7.3 retained his Headquarters and Administration at ELMER and also functioned as Navy Deputy for CJTF-7 and Deputy in command of JTF-7 matters Eniwetok when required.

1.2 PERSONNEL

1.2.1 ALLOCATIONS AND PROCUREMENTS

In March 1957, CTG 7.3 forwarded to the Chief of Naval Operations his formal recommendation for personnel considered necessary for the 1958 test series. The Chief of Naval Operations approved this recommendation. An appropriate proviso was included in his Personnel Allocation and Personnel Requirements Plan for a CTG 7.3 projected personnel strength of 37 officers and 848 enlisted. They were assigned as follows:

	Officer	Enlisted
CTG 7.3 Staff	24	-
Boat Pool	3	224
Boat Pool Detachment	3	189
Special Projects Unit	6	159
Decontamination Unit	1	201
Flagship Allowance	-	53
Headquarters Allowance	-	22
	37	848

The build-up of Task Group 7.3 Staff and Headquarters from an interim strength of 12 officers and 12 enlisted to 24 officers and 22 enlisted was accomplished during the first and second quarters, fiscal 1958. All Task Group 7.3 units, except the Headquarters and Staff, were assembled at the U.S. Naval Amphibious Base, Coronado, San Diego, California. Personnel

(1.2.1 Cont'd.)

administration, berthing and messing were afforded through the facilities of that base. Services rendered were entirely satisfactory for this temporary staging period prior to deployment of the units overseas.

1.2.1.1 MEDICAL CORPS PERSONNEL

In early November 1957 a study was conducted to determine the number of Navy Medical Officers which would be present in the Eniwetok Proving Ground at any one time and the qualifications of each. This study revealed that although there would be a total of six doctors available, none was a fully qualified surgeon. Accordingly CTG 7.3 requested that the medical officer assigned the Staff be a fully qualified surgeon. The Chief, Bureau of Medicine and Surgery concurred and effected the requested assignment.

1.2.1.2 DENTAL CORPS PERSONNEL

A similar study of the Dental Officer situation revealed that an additional three (3) Dental Officers would be required. CTG 7.3 requested the Chief of Naval Personnel via the Chief, Bureau of Medicine and Surgery to provide three (3) Dental Officers for the period 1 March to 1 September 1958. Two (2) were to be assigned the BOXER and one (1) to be assigned the Staff of CTG 7.3. In addition three (3) Dental Technicians to be assigned to the BOXER were requested. The assignment of the foregoing personnel was approved and effected.

1.2.1.3 MEDICAL CORPS DIVING OFFICER

In October 1957, CTG 7.3 requested the Chief of Naval Personnel via the Chief, Bureau of Medicine and Surgery, to provide a Diving Medical Officer, with qualifications as a SCUBA swimmer, be assigned the Staff for the period 1 April to 30 June 1958. This request was approved and a Medical Officer with the aforementioned qualifications reported to the Staff in February 1958. His services later proved invaluable.

1.2.1.4 CHAPLAIN CORPS PERSONNEL

The Chaplain Division of the Bureau of Naval Personnel was consulted in early December 1957 concerning assignment of Chaplains to HARDTACK. A minimum of five (5) Navy Chaplains (3 Protestant and 2 Catholic) were requested for the Operation. Although it was intended to provide seven Chaplains,

(1.2.1.4 Cont'd.)

only five could be made available because of a shortage of available Chaplains.

1.2.2 TASK GROUP 7.3 BOAT POOL, CORONADO

This unit is kept in commission at a reduced allowance during the interim period between operations. Its mission is to provide training to personnel assigned, maintain equipment and provide a nucleus for the build-up of the Unit and the formation of additional units prior to the operational period. The operational allowance of the Boat Pool is 3 officers and 224 enlisted personnel. This Unit deployed to the Eniwetok Proving Ground during February and March 1958.

1.2.3 TASK GROUP 7.3 BOAT POOL DETACHMENT

The scheduling of two underwater events necessitated the procurement and organization of a Boat Pool Detachment to be stationed at ENIWETOK. This Detachment was in addition to the permanent Task Group 7.3 Boat Pool based at BIKINI. CTG 7.3 recommended, and the Chief of Naval Operations approved a personnel allowance of 3 officers and 189 enlisted personnel for this Detachment. This allowance proved to be adequate in overall numbers but the ratio of fireman and seaman ratings was found to be unrealistic. Some engineering ratings were furnished in lieu of seaman ratings. Experience during this Operation has indicated that a ratio of 1½ crews per boat is mandatory for efficient boating operations. A sample proposed allowance for a 183 man Boat Pool Detachment to operate 2 YTBs, 12 LCMs and 2 LCUs during a similar type Operation at the Eniwetok Proving Ground is as follows:

Rating	No.	Rating	No.	Rating	No.	Rating	No.	Rating	No.
BMC	9	ENC	1	MEC	1	EMC	1	SK1	1
BM1	1	EN1	6	ME1	1	EM2	5	SK2	1
BM2	3	EN2	11	ME2	3	EM3	8	SK3	1
BM3	20	EN3	37	ME3	6		14		3
	33		55		11				
						QM3	5	HM1	1
CS2	5	YN1	1	ET1	1				
CS3	4	YN3	1	ET3	1	PN1	1	FP3	1
	9		2		2				
						DC2	2		
SN	41	FN	3						

In addition, certain logistical support personnel were assigned from the Boat Pool Detachment Allowance. These included mail handlers, warehousemen, and camp personnel. Staging of personnel was commenced in October and was accomplished at the U. S. Naval Amphibious Base, Coronado, California.

(1.2.3 Cont'd.)

The Boat Pool Detachment deployed to the Eniwetok Proving Ground in two main increments, with the first increment arriving on 1 March. The primary mission of the Boat Pool Detachment was to furnish boat support and assistance to Task Groups involved in the underwater shots.

1.2.4 TASK GROUP 7.3 SPECIAL PROJECTS UNIT

Since the target array for the underwater shots (WAHOO and UMBRELLA) consisted of Naval vessels, a Special Projects Unit composed of 7 officers and 159 enlisted men were assigned to provide the necessary manpower and technical Navy assistance for towing, positioning in the array and general maintenance. This allowance was recommended by CTG 7.3 and approved by the Chief of Naval Operations. Personnel commenced reporting into the Unit in September 1957 and full allowance was reached in January 1958. Staging was effected at U.S. Naval Amphibious Base, Coronado, California along with the other Task Group 7.3 units. Each target vessel was assigned an officer in charge and a regular crew from this Special Projects Unit.

1.2.5 TASK GROUP 7.3 DECONTAMINATION UNIT

A Task Group 7.3 Decontamination Unit composed of 1 officer and 201 enlisted personnel was authorized by the Chief of Naval Operations to handle the radiological problems concerned with the decontamination of the Target Array vessels and other craft in the array. The nature of Operation HARDTACK and the large number of ships and craft involved made it necessary for the decontamination of the Target Array vessels to be closely integrated with the radiological safety support program. The provision of the 200 man Decontamination Unit was the effective solution to this problem. The Unit staged at the U.S. Naval Amphibious Base, Coronado, California in January 1958. Adequate instruction and training was provided through Naval schools facilities. The Unit deployed to the Eniwetok Proving Ground in April 1958. Five officers from the Postgraduate School, Monterey (including one Army and one Air Force) and ten enlisted personnel from the U.S. Naval Schools Command participated in the actual decontamination phase of the target array after WAHOO and UMBRELLA.

1.2.6 TASK GROUP 7.3 FLAGSHIP ALLOWANCE

During previous Operations of this type the Task Group Commander

(1.2.6 Cont'd.)

was authorized a Flagship Allowance of 23 enlisted personnel. This group embarked in the Flagship during the operational period of the tests only and consisted of personnel for the Admiral's Mess, Barge Crew and Flag Communications. The shortage of available radioman ratings for fleet units necessitated the placing of a special requirement on the Pacific Fleet Enlisted Personnel Distribution Office for an augmentation of 29 additional radioman ratings to the Flagship Allowance of CTG 7.3. Of the 29 supervisory ratings and circuit operators requested, a total of 4 were furnished who had any previous shipboard operating experience. The balance of 25 were newly graduated Class "A" School students. This action was necessitated by the division of the command communications responsibilities between the ENIWETOK and BIKINI Atolls. These two Communication Centers, although approximately 200 miles apart, required around-the-clock operation and maintenance. All personnel embarked in the BOXER prior to deployment to the Eniwetok Proving Ground.

1.2.7 USS BOXER (CVS-21) PERSONNEL

The USS BOXER (CVS-21), which served as Command Ship for the Joint Task Force Commander, Flagship for Commander Task Group 7.3, and Headquarters Ship for the Commander Task Group 7.1, Commander Task Group 7.4, and as Air Operations Center (Air Force), was provided a reduced allowance for duration of the Operation. This allowance consisted of a total of 56 officers and 853 enlisted. BOXER "can do" spirit and complete reluctance to consider any assigned task too great enabled her to successfully accomplish her many and varied assignments in spite of a reduced allowance.

1.2.7.1 USS BOXER (CVS-21) MARINE CORPS DETACHMENT

The U.S. Marine Corps Detachment of 1 officer and 26 Marines was augmented by 30 Marines. This augmentation was provided for use as security guards for movement of devices and was adequate for duties as contemplated and assigned.

1.3 TRAINING

1.3.1 STAFF

While in transit or upon first reporting to the Staff for duty, officers were scheduled for one or more of the following courses of instruction:

(1.3.1 Cont'd.)

Weapons Orientation Course
Fleet Training Center
U.S. Naval Base
Norfolk, Virginia

Special Weapons Orientation Advanced Course
Field Command
Armed Forces Special Weapons Project
Sandia Base
Albuquerque, New Mexico

Atomic Weapons and Guided Missile Orientation Course
Antiaircraft Artillery and Guided Missile Center
Fort Bliss, Texas

Field trips were made by Staff officers to various military commands and government agencies connected with the Atomic Energy Commission, the Armed Forces Special Weapons Project, and Joint Task Force SEVEN.

1.3.2 WEST COAST UNITS

The training program for assigned Boat Pool personnel was augmented during the period September 1957 to February 1958. Included was training at service schools and courses of instruction at the U.S.Naval Amphibious Base, Coronado, California and the Naval Schools Command, U.S. Naval Station, San Diego, California. Scope of training was in the fields of Radiological Safety, First Aid, Amphibious Boat Handling, Survival on Water, Radiological and Chemical Warfare and Radio Voice Communications. A continuous program in security training was provided.

1.3.3 NUCLEAR ENGINEERING EFFECTS COURSE STUDENTS

Five (5) officers of the Nuclear Engineering Effects Course at the Naval Postgraduate School, Monterey, California were permitted an opportunity to participate in the decontamination phase of one event. One of the three Naval officers, an instructor, arrived in mid-May and the other four, who had been students, proceeded to the EPG immediately upon graduating from the course on 6 June. They departed the EPG on 20 June 1958.

1.4 STABILIZATION OF PERSONNEL

In September 1957, CTG 7.3 requested the Chief of Naval Personnel via Chief of Naval Operations to stabilize personnel of Navy Units assigned Operation HARDTACK for the period of 1 January to 1 September 1958. It was further requested that the Boat Pool, Boat Pool Detachment, Special Projects Unit and Decontamination Unit be brought up to and maintained at full 100%

(1.4 Cont'd.)

allowance. In addition it was requested that enlisted allowance of ships and units assigned Task Group 7.3 be filled at the highest possible level. The Chief of Naval Personnel replied indicating that "transfers of personnel attached to units involved in the Operation will be deferred until completion unless such action will unduly penalize the individual in question". Further, "that billets under the direct distributional control of the Chief of Naval Personnel will be manned at 100% of allowance overall", also that "the manning levels provided fleet units and the stability of personnel affected by controllable movement other than normal sea/shore rotation are matters within the purview of Commander in Chief, U.S. Pacific Fleet". By copy of the letter the Chief of Naval Personnel requested Commander in Chief, U.S. Pacific Fleet to advise as to the names of fleet units involved in the Operation and the period in which they would be deployed in order that controls could be established. CTG 7.3, referring to the aforementioned letter from the Chief of Naval Personnel, requested Commander in Chief, U.S. Pacific Fleet to accord such consideration as might be feasible in effecting early stabilization. It was requested that CTG 7.3 Boat Pools, Special Projects Unit and Decontamination Unit be brought up to 100% of manning level and that all Fleet Units assigned Operation HARDTACK be brought up to as near the 100% manning level as may be feasible. Commander in Chief, U.S. Pacific Fleet indicated that "within limits available personnel, Commander in Chief, U.S. Pacific Fleet desires that units participating HARDTACK be manned insofar as practicable as laid down in reference. However, special distribution within type commands to meet unusual requirements of individual units is a responsibility of the type commanders concerned". (All Type Commanders were sent a copy of letter together with reference). Reports affirm that the Enlisted Personnel Distribution Office, U.S. Pacific Fleet exercised every effort to provide best possible stabilization of personnel.

1.4.1 ASSIGNMENT OF FLEET UNITS

The assignment of Pacific Fleet Units to participate in Operation HARDTACK was not finally resolved until October 1957. This late scheduling adversely affected the program of stabilization of personnel desired by the Task Group Commander.

[redacted]

1.4.1.1 FLEET PERSONNEL MANNING LEVEL

Reports indicate that where possible ships and units designated for HARDTACK were provided personnel in excess of the stringent manning level necessarily required in the Pacific Fleet.

1.5 TRAVEL ORDERS

Task Group 7.3 Staff home ported in Washington, D.C., and special Units staged at Coronado, California, consisted of some 850 personnel. These personnel plus a Marine Helicopter Squadron, special diving team, and personnel sponsored by Task Group 7.3 from various Bureaus of the Navy Department raised the total figure to approximately 1050. Due to the short duration of overseas deployment it was decided that these personnel would all deploy under temporary additional duty (TAD) orders. It was considered neither feasible nor practicable to have Task Group 7.3 personnel ordered to the Eniwetok Proving Ground on permanent change of station (PCS) orders since it is necessary to form units within the continental limits of the United States for the purpose of training and indoctrination several months prior to movement to the forward area.

1.5.1 DELEGATION OF AUTHORITY TO ISSUE TRAVEL ORDERS

To facilitate ordering this large number on temporary additional duty, letters were forwarded to certain commands delegating authority to issue appropriate orders. No problems were encountered by this method. All personnel deployed to the Eniwetok Proving Ground in an orderly manner. It is to be noted that authority to issue TAD orders should contain explicit instructions as to information which should be included in orders to insure compliance with CINCPAC letter serial 020 of 1 April 1952.

1.6 DEPLOYMENT

1.6.1 PERSONNEL

Headquarters and Staff deployed to the Eniwetok Proving Ground in various increments as certain responsibilities necessitated. A small Staff Communications Detachment arrived in the Eniwetok Proving Ground in mid-January to supervise communications equipment installations at the Task Group 7.3 Communications Center on Parry Island. The Deputy Commander Task Group 7.3 accompanied by a small group of Staff officers and Headquarters enlisted personnel departed Washington, D.C. about 15 February and embarked in USS

[redacted]

(1.6.1 Cont'd.)

BOXER (CVS-21) at Honolulu, T.H., arriving at the Eniwetok Proving Ground on 3 March 1958. The Commander Task Group 7.3 arrived in the Eniwetok Proving Ground on 18 March 1958. Deployment of Task Group 7.3 personnel attached to the West Coast based Units was effected by Naval surface lift and government air.

1.6.2 FILES AND EQUIPAGE

Command files and office equipment were air-lifted in the CJTF SEVEN special records flight departing on 9 March 1958 from Andrews Air Force Base and arriving in the Eniwetok Proving Ground on 12 March 1958. An enlisted courier from the Headquarters accompanied the shipment from the Headquarters in Washington, D.C. to the Flagship.

1.7 U. S. MAIL

The vast percentage of the 9,178 personnel of the Navy participating in Operation HARDTACK were stationed aboard ships of the Fleet. With limited recreational facilities providing for about one afternoon a week ashore, the best available approach to good morale was rapid and frequent delivery and dispatch of U.S. Mail. To this end, the Commander Joint Task Force SEVEN initiated Military Air Transport Service (MATS) airlift of all mail and parcel post from San Francisco, California to the Eniwetok Proving Ground. A similar arrangement was provided for all mail and parcel post being dispatched from the Eniwetok Proving Ground to the United States. All U.S. Mail for Task Group 7.3 ships and units was handled through the Mail Concentration Center at San Francisco, California in coordination with the Fleet Post Office. The latter activity was advised by CTG 7.3 of original departure and arrival dates of all Task Group 7.3 ships and units deploying from the continental limits of the United States to the Eniwetok Proving Ground. This one-time report was supplemented with routing information from individual ships and units as movements required. Transit time for mail from postmark date on West Coast of United States to Eniwetok approximated 3 to 4 days. At the beginning of the Operation it was discovered that insufficient space was available on scheduled Military Air Transport Service (MATS) for U.S. Mail originating out of Honolulu, T.H. This situation was rectified by a firm and permanent space allocation on MATS

(1.7 Cont'd.)

for U.S. Mail originating at Honolulu, T.H. Onward routing of U.S. Mail from Eniwetok to Bikini occasioned delays due to airlift of priority cargo and passengers. These delays, though infrequent and of short duration, were of much consequence to units based at Bikini.

1.7.1 U. S. MAIL HANDLERS

Commander Task Group 7.3 furnished a total of five mail handlers permanently to APO 187 and APO 436 during the Operation.

1.8 GUARD MAIL

Guard Mail was administered through the offices of the respective SOPA (ADMIN).

1.8.1 ENIWETOK GUARD MAIL

The Guard Mail Center at ENIWETOK Atoll was maintained at SOPA (ADMIN) Office on Site ELMER. Pickup and delivery of Guard Mail and U.S. Mail was made to each ship daily by SOPA (ADMIN) ENIWETOK Guard Mail boat. This procedure, coordinated through the APO 187, proved to be the most effective method considering distances involved, boating hazards, and the location of the Guard Mail Center in a Restricted Area requiring JTF SEVEN security badging.

1.8.2 BIKINI GUARD MAIL

The Guard Mail Center at BIKINI Atoll was in the USS BOXER (CVS-21) and was augmented by SOPA (ADMIN) ashore. Twice daily trips for pickup and delivery were made by BOXER Guard Mail boat to all ships and the Navy Port Facilities Building on Site NAN.

1.8.3 KWAJALEIN GUARD MAIL

The lack of scheduled transportation (ship or air) between the Eniwetok Proving Ground and Kwajalein posed a special problem for delivery of operational papers to the U.S. Naval Station, Kwajalein and the Navy Patrol Plane Squadron temporarily based there for support of HARDTACK. It was necessary on most urgent occassions to utilize direct air delivery by Navy aircraft to insure delivery of Operation Orders and directives pertaining to HARDTACK.

1.9 INTER-ATOLL HANDLING OF OFFICIAL DOCUMENTS AND OPERATIONAL MATTERS

With a two-atoll concept necessitating two command posts for CTG 7.3

[redacted]

(1.9 Cont'd.)

(Headquarters ashore at ENIWETOK and in the Flagship at BIKINI) the requirement for frequent and rapid transmission of classified documents was found to be a vital necessity. Accordingly a courier and locked pouch was arranged to leave each Command Post twice daily via scheduled inter-atoll airlift.

1.10 EMERGENCY LEAVE

Records of previous Operations of this type indicated that each 10 out of 1000 persons would generate a positive requirement for emergency leave. During the operational phase of HARDTACK of a total of 9,178 Task Group 7.3 personnel in the Eniwetok Proving Ground 99 persons were granted emergency leave. The MATS system provided rapid and thru transportation from ENIWETOK to the continental limits of the United States. Leave returnees contacted the JTF SEVEN LNO Travis Air Force Base where thru MATS airlift from continental limits of the United States to ENIWETOK was arranged. Except for those who departed on emergency leave during the late stages of the Operation, all personnel in an emergency leave status were returned to their duty stations in time to contribute to the wind-up of their unit's phase of the Operation.

1.11 MORALE

The morale of personnel of all Naval Units was considered high nearly all the time. The rotation of most Pacific Fleet ships assigned enabled a greater number of personnel to participate in Operation HARDTACK and reduced the length of time in the Eniwetok Proving Ground for approximately 50% of the Naval personnel participating. The attendant delays connected with scheduled shots sometimes became monotonous to the shipboard based sailor as he progressed through the often repeated phases of getting underway and standing by for shots later postponed. It is recognized that these delays are inevitable; however, the resultant routine does require special effort by all Commanding Officers to maintain morale at a high level among shipboard personnel. In this connection it must also be recognized that shipboard living for a sustained period in a humid climate at an isolated place such as the Eniwetok Proving Ground with limited recreational opportunities tends to adversely affect morale and emphasize the need for energetic command attention.

[redacted]

1.11.1 CERTIFICATES OF PARTICIPATION

Certificates of Participation, handsomely printed in color on parchment paper, were furnished all attached to Task Group 7.3 and to VIP observers. The certificates were made available to ships and units as they reported in the Eniwetok Proving Ground and it is believed that they assisted in reaffirming to personnel participating their individual importance to HARDTACK.

1.12 CONCLUSIONS

1. That the commencement of the build-up of officer personnel in the first quarter of fiscal 1958 was none too early for personnel to enter into the planning phase of the Operation. This allowed them to receive instructions at certain Special Weapons Courses considered most essential to properly equip each officer assigned the Staff. The overall number of personnel both officer and enlisted was generally satisfactory. Having key officers who had REDWING experience proved highly valuable. Experience during HARDTACK has pointed up the desirability of having a qualified legal officer assigned to the Staff during the operational period of future operations. There were legal problems involving naval ships and personnel which had to be acted on by the Commander without the advice of a trained legal officer. Also problems came up which involved civilian and naval personnel.

2. That the training provided personnel of the Staff of CTG 7.3 and the Units assigned was most worthwhile and was reflected in the performance of personnel so trained during the operational period in the Eniwetok Proving Ground.

3. That stabilization as effected for Operation HARDTACK was generally satisfactory. There were, however, instances of excessive personnel turnover as late as March for some Units of Task Group 7.3. This imposed a hardship on units concerned because of losing men with special training and those for whom security clearance applications had been initiated. New men were inadequately trained and in some instances still required security clearance just prior to the ship's departing for the Eniwetok Proving Ground.

4. That late scheduling of Pacific Fleet units designated to participate in Operation HARDTACK imposed an additional burden on the per-

[redacted] [redacted]

(1.12.4 Cont'd.)

sonnel distribution commander in obtaining qualified replacement personnel and in effecting early and adequate training.

5. That on the whole, units of Task Group 7.3 reported personnel assigned as being adequate by being in excess of the Fleet Manning Level. There were some instances of ships being below the Fleet Manning Level in petty officer ratings.

6. That the procedures followed in ordering personnel on TAD to the Eniwetok Proving Ground proved to be highly satisfactory.

7. That the deployment of the Staff personnel and shipment of files and equipage was planned and effected most satisfactorily.

8. That timely receipt of U.S. Mail is the most important morale factor for personnel engaged in an operation of this type. That U.S. Mail service was generally excellent, the one exception being times when personnel and/or cargo took priority over mail.

9. That the Guard Mail system as augmented by the CTG 7.3 courier system was most satisfactory.

10. That the students from the Nuclear Engineering Effects Course gained valuable experience during the period of their participation.

1.13 RECOMMENDATIONS

1. That the request for personnel allocations for operational allowances be submitted to the Chief of Naval Operations six months prior to desired reporting date of personnel.

2. That the officer build-up commence in the first quarter of the Fiscal Year in which a future Operation is scheduled. The build-up of enlisted personnel for units of the Task Group such as Boat Pool, Coronado, Boat Pool Detachment, Special Projects Unit and Decontamination Unit should be commenced in the second quarter in order that sufficient training can be accorded.

3. That due to the large number of naval ships and personnel participating in these operations and the nature of the organization of other Task Groups, the Chief of Naval Personnel should be requested to assign a legal officer of the grade of LT or LCDR to the Staff on a temporary additional duty basis for the operational period.

[redacted] [redacted]

[redacted]

(1.13 Cont'd.)

4. That in future operations a program of definite assignment of ships and units six (6) months prior to deployment date be realized.

5. That Pacific Fleet ships and units assigned to the Operation be brought up to as near 100% of allowance as possible prior to deployment.

6. That necessary replacement personnel be on board at least two (2) months prior to deployment.

7. That the Chief of Naval Personnel direct a formal stabilization program for personnel participating in such a security-conscious and extended Operation as HARDTACK, and that such stabilization be effected at least three (3) months prior to the operational phase.

8. That all officer personnel upon assignment to the Staff continue to be ordered to the various courses of instruction in nuclear weapons, missiles or devices which are or may become available.

9. That similar procedures established for ordering personnel on TAD to the Eniwetok Proving Ground be followed in future Operations.

10. That similar procedures in deployment of personnel and shipment of files and equipage be followed in future Operations.

11. That a similar system for delivery of U.S. Mail to the Eniwetok Proving Ground be established for future operations. That in view of its importance as a morale factor, that measures be taken to insure that top priority is accorded delivery of U.S. Mail.

12. That a similar Guard Mail system be established for future Operations.

13. That security measures regarding personnel be established well in advance.

14. That procedures for handling Filipinos with regard to clearance be commenced as early as possible.

15. That opportunity be afforded a similar number of students of the Nuclear Engineering Effects Course for participation in subsequent operations.

[redacted] [redacted]

SECTION 2

SECURITY AND RECREATION

2.1 GENERAL

2.1.1 SECURITY

The missions of the security and intelligence section were:

a. To safeguard classified information and material.

b. To implement CJTF-7's security indoctrination, training and clearance program for Task Group personnel.

c. To promulgate procedures for compliance with CINCPAC letter serial 020 of 1 April 1952.

d. To administer the HARDTACK identification badge system for Task Group 7.3.

e. To implement all other CJTF-7 security directives applicable to Task Group 7.3.

2.1.2 RECREATION

The missions of the recreation and welfare section were:

a. To furnish logistic support and funds to supply certain equipment for Camps Parsons and Blandy, the Ham stations at NAN and ELMER, Armed Forces Radio Station outlet in BOXER, and Television sets for selected minor elements of the Task Group.

b. To establish and organize competitive sports and games programs for the purpose of furnishing for the Task Group personnel additional recreation outlets.

2.2 INTERIM STAFF FUNCTIONS

2.2.1 SECURITY

The billet of Staff Security Officer was not filled during the interim period. The necessary functions of checking and obtaining clearances for newly reporting personnel were handled by the Administrative Section. They also furnished the necessary clearance certificates required for personnel attending schools and visiting areas requiring such certification.

2.2.2 RECREATION

There was no recreation fund to administer during the interim period. The recreation fund was disestablished by distributing the money remaining, after repayment of loans, to the ships and units participating in REDWING.

2.3 PRE-OPERATIONAL REQUIREMENTS

The Staff Security and Recreation Officer reported to the Staff in November 1957. Since the billet had not been filled during the interim period considerable time was devoted to the study of files and records of REDWING. Following this study the following steps were taken to prepare for the forthcoming operation.

2.3.1 SECURITY

Liaison was set up with the CJTF-7 J-2 to determine the necessary clearances and badging requirements for HARDTACK. The functions previously handled by the Administration Section were assumed. All incoming officers and enlisted personnel's records were checked and the proper clearances granted. The officers were all granted TOP SECRET clearances and the enlisted personnel at least SECRET. In those cases where Background Investigations had clearly been performed the enlisted men were cleared TOP SECRET.

Security Instructions and Notices based on CJTF-7 Standing Operating Procedures were issued to all ships and units to be assigned to HARDTACK. Badge request forms were mailed at this time so that they could be completed and returned. This allowed them to be forwarded to the EPG so that badges could be prepared prior to the arrival of the personnel.

It was recognized that aliens attached to the Task Group units might present a security problem. Positive action was taken in early February to determine the number of aliens in the Task Group and the status of their security clearances. Action at this time proved to be too late. The results of a survey by message, revealed 90 aliens, mostly Filipinos, with no valid security clearances. It also pointed up the fact that there was an almost unanimous lack of understanding of the Navy Security Manual regarding clearance criteria for aliens on the part of the Task Group ships. Chief of Naval Operations authorized "Limited access authority" of Confidential for Filipino

[redacted]

(2.3.1 Cont'd.)

aliens based on a satisfactory National Agency Check and a modified Background Investigation for the duration of Operation HARDTACK only. The final clearance of all aliens was completed in May. It was necessary to allow uncleared Filipino aliens to enter the proving ground while the ONI processing was underway or transfer them prior to departure for the EPG. Transferring them was considered undesirable as the majority of these men were in the steward branch. In some cases they represented 80 to 90 percent of all the stewards on the ship. Filipino aliens were not permitted on shore pending clearance.

2.3.2 RECREATION

Since the Task Group 7.3 Recreation Fund had been disestablished following REDWING, it was necessary to establish a new command recreation fund. This was done by obtaining an initial grant of $20,000 from the Bureau of Naval Personnel. Of this initial grant, $11,000 was intended for the installation of a mobile television station in a trailer van. The total cost chargeable to the recreation fund was only $4,412.85; consequently the remainder of the $11,000 grant was returned to the Bureau of Naval Personnel. A portion of the $9,000 remaining in the recreation fund was used to purchase recreational equipment and television sets. $1,000 was deposited with Commander Service Force, U.S. Pacific Fleet during the REDWING planning period to be used during the operational period for purchase of equipment in Pearl Harbor. This money, however, was not used as it was determined that purchases could be made direct from a dealer in Honolulu. This procedure was used during the operational period to augment the recreation supplies. The initial purchase of recreation equipment was made by the USS BOXER (CVS-21) on the West Coast and she transported this equipment to the EPG. This procedure simplified the procurement of the equipment and saved cross-country shipping charges.

During the pre-operational period the procedures for conducting the competitive tournaments were formulated. Ships and units assigned were queried on their preferences for acting as hosts for the various competitions. This included softball, volleyball, horseshoes, table tennis, and even checkers, cribbage and chess. The various host ships were designated and the plans for the tournaments promulgated.

[redacted]

[redacted] [redacted]

2.4 OPERATIONAL PERIOD

2.4.1 SECURITY

It became immediately apparent that all officers on each ship required a security badge. The SOPA (ADMIN) and the CTG 7.3 Staff Detachment offices were located in the Administrative Compound. At one time or another all ships' officers were required to contact Task Group 7.3 Staff and SOPA (ADMIN) personnel in a line of duty. The use of temporary badges for this purpose proved too restrictive. Therefore, after arrival of the units in the EPG, they were instructed to procure badges for all ships' officers. This placed an additional load on the Task Group 7.5 Badge Office, but the issue of the badges was still handled notably.

The introduction of cameras by personnel arriving by air for duty aboard ships proved a problem. These personnel were not properly instructed prior to reporting for transportation. There were numerous incidents of arrivals having cameras, and in most cases they had not been told that they could not bring these into the EPG. The cameras were always confiscated on arrival at FRED. They had to be picked up from the Military Police by either the security officer or his enlisted assistant and delivered to the security office of the ship in question. This proved to be very time consuming. It would appear that a better briefing on contraband items is necessary for personnel boarding aircraft proceeding to the EPG. Except for the two items above no difficulties were encountered. No security violations were reported against Task Group 7.3 personnel.

2.4.2 RECREATION

SOPA (ADMIN) BIKINI opened Camp Blandy. The Staff Recreation Officer opened Camp Parsons. Both Camps were made available to officer grade personnel of all Task Groups and to all enlisted military personnel in the Task Force.

A target profit figure of $20,000 was set for combined camp operations in order to be certain of generating sufficient funds to repay the approximately $15,000 loaned by BuPers for recreational purposes. This was achieved in mid-June and prices were dropped low enough merely to cover overhead costs for the remainder of the operation. Overhead costs consisted chiefly of camp

[redacted] [redacted]

[redacted]

(2.4.2 Cont'd.)

operators' salaries.

Ham and Television Stations at Bikini went into operations in mid-April. Delay until this time was caused by lack of a proper power generator. Television sets were distributed to small units who had no command funds available and the supply of sets was adequate. Twenty-three sets were brought to the Eniwetok Proving Ground. The Ham station was of especial benefit to morale.

Purchase of camp supplies, i.e., whiskey, beer, soft drinks, food, etc. from Holmes and Narver, solved several problems of logistics and large outlays of cash. The only disadvantage was that the prices were higher than if these items were procured from the Navy sources and transported from the continental limits of the United States by Task Group 7.3 ships.

Work preparatory to opening the camps commenced in early March. Both camps opened for operation prior to 21 March. Holmes and Narver installation work was behind schedule. Lack of numerous small items such as cleaning equipment, hand tools, cooking utensils, and cash boxes impeded the pre-opening work at both camps. Holmes and Narver would not furnish this equipment and in some cases did not have it available. The ships were reluctant to furnish these items from their allotments.

Transportation to and from Camp Parsons left much to be desired. Personnel were transported from ships to ELMER and transferred to ELMER and transported to an LCU for the rough water trip to the Camp on DAVID. This process was about 45 minutes to an hour each way. Consideration might be given to obtaining greater usage of the facilities on FRED.

The Television trailer has been assigned to the temporary custody of Naval Station, Kwajalein for use during the interim period. It is available for return to CTG 7.3 when required and cost of upkeep during interim period is borne by Naval Station, Kwajalein.

The foreign merchandise program aided immeasurably in enhancing the tour in the EPG. It gave personnel some of the advantages of a normal WestPac tour.

A daily eight-page newspaper, THE BOXER PRESS, was published aboard the flagship and was distributed to all ships in the EPG as well as personnel

[redacted]

[redacted]

(2.4.2 Cont'd.)

ashore at Bikini and Eniwetok. This newspaper was eagerly received by all hands as it contained the most detailed news coverage available in the EPG. In order to assist in its publication, two yeomen from the Boat Pool were assigned to the BOXER for this purpose.

2.5 CONCLUSIONS

2.5.1 SECURITY

1. That the main security objectives were attained. Minor difficulties experienced were stated in the foregoing.

2. That instructions to Boat Pool, Boat Pool Detachment, Special Projects and Decontamination Unit allowed time to complete investigative process leading to security clearances. The clearance process was well organized and effective. The only improperly cleared personnel on board on deployment to the proving ground were replacement personnel received just prior to ship or unit departure. National Agency Checks were immediately initiated; however, such late submission did not permit completion of investigations until after ship or unit arrival in EPG.

3. That badging requirements were underestimated in the planning phase.

4. That the basic badge instruction proved too comprehensive for the practical purpose it was to serve.

5. That briefings on contraband items at Hickam and Travis were not completely effective.

2.5.2 RECREATION

1. That the mission covered the Task Group requirements adequately and all objectives were attained.

2. That initial grants of $9,000 and $11,000 were more than adequate.

3. That general instruction covering the subject of recreation served to inform Task Group personnel of all facilities planned and each unit's responsibility regarding recreation in the Eniwetok Proving Ground. It also furnished a basis for making plans and preparations prior to departure from the Eniwetok Proving Ground.

[redacted]

(2.5.2 Cont'd.)

4. That although the facilities of both camps were opened to officer grade personnel of other Task Groups and to all enlisted military personnel of the Joint Task Force, they did not overcrowd the facilities.

5. That the Ham stations provided services highly significant to morale; however, schedules with East and West coast stations were not always available.

6. That the organized athletic tournament program was not practicable at Bikini due to the small number of ships based there and the uncertain operating schedules. Competitive play between the permanently based units was conducted on a non-tournament basis and produced the desired recreational outlets, however. The Eniwetok competitions were conducted with some difficulty due to the operating demands on the ships. The playoffs for the final events took place in early July. Trophies were turned over to tournament directors for presentation to winners. Inter-Atoll competitions would not have been feasible due to the length of time competing teams would have been absent from their ships.

2.6 RECOMMENDATIONS

2.6.1 SECURITY

1. That all officers on Task Group 7.3 ships, plus mail clerks and communications messengers be badged.

2. That all personnel of Boat Pool, Boat Pool Detachment, Decontamination Unit and Special Projects Unit be badged.

3. That a badge request Instruction which contains information pertinent to Task Group 7.3 requirements be issued.

4. That determination, by message, of the number of uncleared aliens in Task Group 7.3 be made as early as possible.

5. That liaison be established with CNO requesting authority for limited access to confidential material in the case of Filipino aliens based on NAC and modified BI.

6. That promulgation of other security instructions be made as soon as possible after CJTF-7's directives are received. Close liaison with CJTF-7 J-2 section is required.

[redacted]

(2.6.1 Cont'd.)

7. That the Security Officer arrive in the proving ground three or four days before the main body of the Staff. This would allow sufficient time for procurement and distribution of all badges from the badge and pass office at ELMER.

8. That if Marine sentries are to be used for the next operation, CJTF-7 be requested to issue a directive covering their status, type of employment and jurisdictional control. Ample time should be allowed for obtaining TOP SECRET clearances.

9. That the command issuing the clearance for personnel entry into the EPG required by CINCPAC ltr ser 020 of April 1952 should be required prior to the person's departure for the EPG to make a baggage search in addition to a briefing on contraband items.

2.6.2 RECREATION

1. That purchase of camp supplies from Holmes and Narver be continued.

2. That cleaning equipment, hand tools, cooking utensils, cash boxes, etc. to be used at recreation camps be purchased prior to Camp opening.

3. That an Amateur Radio Station operator be assigned at San Diego and Washington, D.C. to ensure a reliable contact for phone patch traffic. If necessary, establish a station at these points.

4. That two ham stations be located at Bikini and one at ELMER.

5. That for future operations softball, volley ball and horseshoe tournaments only be instituted. These events afford more spectator and participant recreation than the single man competitions such as card games and were more popular with all hands.

6. That Inter-atoll competition not be attempted.

7. That the Television trailer be assigned to Naval Station, Kwajalein for use during the interim period.

8. That one J02 and one J03 be assigned to the flagship allowance to assist the flagship in publishing a daily newspaper for distribution throughout the proving ground.

[redacted]

SECTION 3

PLANS AND OPERATIONS

3.1 MISSION

The broad mission of Task Group 7.3 was to provide the necessary naval support, including emergency evacuation capability for the entire task force, as required by Joint Task Force SEVEN. A total of 35 distinct tasks in support of this broad mission were assigned to Task Group 7.3 by the Joint Task Force Operation Order. Additionally, Task Group 7.3 was charged with special tasks in connection with the YUCCA, WAHOO and UMBRELLA events.

The NEWSREEL phase (TEAK and ORANGE events) of Operation HARDTACK is shown separately under Section 8.

3.2 FORCES

Operating forces were as shown in appendix to Commander's Report.

3.3 ORGANIZATION AND COMMAND RELATIONSHIPS

3.3.1 GENERAL

Smooth and effective command relations were maintained throughout the operation and only minor deviations were necessary to meet changing situations.

Eight task units for the operational phase and one task unit for pre-operational testing were established by CTG 7.3 Operation Order 1-58. The basis for this organization was the mission to be accomplished. Since the actual mission performed by several of the ships turned out to be quite different from the originally assigned missions, it is now felt that there were too many separate task units. The tasks of Task Group 7.3 could have been performed effectively with five task units, namely; (1) a flagship unit operating as directed by the Task Group Commander, (2) a unit which might have been called the Eniwetok Operations Unit with all forces at Eniwetok included as task elements in this unit, (3) another unit, the Bikini Operations Unit, comprising all units normally stationed at Bikini assigned as elements, (4) the Patrol Plane Unit based at Kwajalein, and (5) a Pre-Operational Testing Unit. Other units were unnecessary since, as stated above, these units could properly

[redacted]

(3.3.1 Cont'd.)

have been included as elements in the five broad task units. Such a consolidation would have left several blanks in the standard task unit organization which could have been readily employed for special events such as WAHOO and UMBRELLA. It is worthy to note that the Destroyer Squadron Commander assigned as SOPA (Admin) Eniwetok actually performed most of the functions of the Eniwetok Operations Unit, and in addition directed the operations of his own destroyers. However, he was assigned these duties as commander of two different task units. The fact that the same officer performed both missions with the same staff made the two units work as one and solved many of the problems before they occurred.

The division of the CTG 7.3 Staff between Eniwetok and Bikini dictated a need for a Deputy Commander who could function at Bikini when the Task Group Commander was absent from that area. The Chief of Staff was ordered to duty as the Deputy Commander of Task Group 7.3 and the organization worked smoothly regardless of the location of the Commander.

3.3.2 COMMAND RELATIONS

Command relationships between the Joint Task Force and Task Group 7.3 were excellent and were largely affected by the following factors; (1) the basing ashore at PARRY Island of the Commander Task Group 7.3 allowed for the closest liaison with the Joint Task Force, and (2) the delegation of the Chief of Staff as Deputy Commander Task Group 7.3. This permitted a condition of flexibility and freedom of action where operations could be conducted at two locations simultaneously. As a result of these factors the Commander Task Group 7.3 could act as Deputy for Navy on the Joint Staff and as Navy Task Group Commander. For future operations, however, it is recommended that the billets of Deputy Commander Navy on the Joint Staff and Navy Task Group Commander be separated. This may seem paradoxical; however, separation of the billets would provide even greater flexibility and freedom of action.

The U.S. Naval Station, Kwajalein was requested through the Commander in Chief, U.S. Pacific Fleet to perform certain supporting tasks for the Joint Task Force. These were approved and CTG 7.3 was designated by CJTF SEVEN as his agent and coordinator for matters pertaining to Kwajalein.

[redacted]

[redacted]

(3.3.2 Cont'd.)

At the start of Operation HARDTACK operational control of all naval and MSTS ships and units entering the EPG was vested in the Commander Task Group 7.3 with the exception of the MSTS T-LSTs assigned to support Task Group 7.5. Operational control of these ships was left with the Commander U.S. Army Task Group 7.2 who had been designated the MSTS Representative Eniwetok during the interim period preceding the operational phase. As a result, isolated incidents occurred where these T-LSTs were sailed without prior notification to CTG 7.3 and through danger areas via inadvisable routes. Although coordination was soon established with Task Group 7.2, it would have been better to have had these ships under the movement control of CTG 7.3.

3.4 PLANNING AND TRAINING

3.4.1 PLANNING

The broad lines of prospective naval participation in HARDTACK over and above normal support functions were laid down in the documents issued by the Special Weapons Effects Task Group in the fall of 1956. These documents set forth the forces required, targets of underwater shots, objectives to be met and recommendations for programs to achieve these objectives. After much preliminary discussion, it was settled that the targets for underwater shots would consist of three destroyers, a merchant marine hull, an active submarine and the SQUAW-29 (the only target left from WIGWAM). These vessels were assigned to CTG 7.3 by CNO. In conjunction with the Bureau of Ships, the Underwater Explosions Research Division at the Norfolk Naval Shipyard, the Naval Ordnance Laboratory, and the Office of Naval Research, planning commenced as to how these targets could best be utilized to obtain optimum test results. The final approval of their placement was vested in CTG 7.1 who endeavored to meet the naval desires in every possible way.

3.4.2 TRAINING

The entirely new and unique aspects of the WAHOO and UMBRELLA events dictated the direction the majority of the training effort was to take, particularly with respect to the WAHOO event. Deep water moors in depths of water up to 1000 fathoms had never before been considered feasible, and no precedent or acceptable procedures had been set up.

[redacted]

[redacted] [redacted]

(3.4.2 Cont'd.)

In coordination with the Bureau of Ships in June 1956, design work was begun on the WAHOO and UMBRELLA arrays based upon weather and sea conditions expected to exist in the Eniwetok Proving Ground for the applicable time of year. A design was finalized in the fall of 1956, and plans were made to test the design and train personnel at the actual WAHOO and UMBRELLA sites. Tests and training were successfully completed in the EPG in late February and early March of 1957. Additional tests were performed off Barbers Point in early November 1957. These tests were accomplished with the fleet tugs MOCTOBI and TAKELMA, with the salvage ship GRASP handling the weapon and assisting with the moorings. Valuable information was obtained and these tests provided the major guidance for the actual operation.

A test and training dive of the refitted SQUAW was conducted off San Diego in the fall of 1957 to a depth of water approximately that of the Eniwetok Lagoon. This test was completely successful.

Another test, actually a part of the operation, was a Project 3.1 tapered charge test conducted off Santa Cruz Island. In this test one of the destroyer targets, already fitted out for her HARDTACK role, was moored and three tapered charges were fired at her. These charges provided the check data with which nuclear shot effects could be correlated.

An important pre-operation training evolution was the training of aircraft and surface elements in the recovery of rocket nose cone sampling devices from the open sea. Device testing and recovery training was first conducted at the Salton Sea in early December 1957. The naval objective of this exercise was to prove the feasibility of search by P2V aircraft, and in coordination with surface craft, recovery of these nose cones from the water. It was decided to conduct a further test in the open sea in late January 1958 in order to improve search techniques and to prove out the possibility of recovery for both helicopters and destroyers. This test was conducted off Point Mugu and proved both methods of recovery entirely feasible. In the early phases of the operation further training in coordinated recovery techniques was conducted in the EPG.

[redacted] [redacted]

[redacted]

(3.4.2 Cont'd.)

Training of personnel in radiological safety will be discussed in a later portion of this report.

3.5 DISPOSITION OF FORCES

3.5.1 SURFACE

As ships reported to the EPG a more or less natural division of forces took shape due to operational requirements. In general, the forces at Bikini were: USS BOXER (CVS-21), USS CACAPON (AO-52), one destroyer and the T-AP AINSWORTH. Planning had also called for one LSD to be stationed at Bikini, but the additional requirement for the site at Johnston Island early in the operation necessitated the reassignment of this LSD to support the buildup for this site. Forces at Eniwetok were: Six ATFs, two ARSs, one ASR, all targets, one repair ship, three DDs, one LSD and an APA. Fuel requirements at Eniwetok were largely handled by the YOS-32. This seemingly unbalanced division of forces was necessitated by the demands generated in mooring the target array. Stationing the repair ship at Eniwetok made her available to the most ships. The APA was stationed to provide an emergency evacuation capability for the Eniwetok Atoll.

Disposition of forces at Johnston Island is fully discussed under the NEWSREEL portion of this report.

3.5.2 AIR

Air elements assigned were Patrol Squadron TWENTY-EIGHT (augmented) and Marine Helicopter Squadron (Light) - 361. Patrol Squadron TWENTY-EIGHT augmented by four aircraft from Patrol Squadron TWENTY-TWO was based at Kwajalein. This sixteen plane P2V squadron was charged with surveillance of the danger area throughout the operation. HMR(L)-361 with fifteen HRS-3s was based aboard the USS BOXER but operated mainly from NAN Island in support of the scientific effort at Bikini. On several occasions a detachment of this squadron operated in support of the operations at Eniwetok and were then operated from either the USS BOXER or the USS MONTICELLO, depending upon which ship was in the area at the time.

Discussion of the functions and roles played by the air elements is fully discussed under the air operations portion of this report.

[redacted]

[redacted]

3.6 WEATHER

The need for rapid and accurate collection of weather data is of prime importance in the conduct of successful nuclear test detonations. Certain areas could not be covered from shore stations and required surface craft. Task Group 7.3 was assigned the mission of manning these additional stations. Success of surface weather operations during Operation REDWING was so marked that twice the number of destroyers was requested for HARDTACK in order that weather stations could be manned on an almost continuous basis.

HASP rockets were procured by Joint Task Force SEVEN and distributed to the ships of Destroyer Division ELEVEN with spares carried in the USS BOXER. A new type adapter was developed by the Office of Naval Research for use with the 5"/38 gun mount for firing rockets. Arrangements were made for each destroyer to carry an adequate supply of 5"/38 window shells of all types.

After arrival of Destroyer Division ELEVEN in the EPG, representatives of the Joint Task Force SEVEN Weather Central, Task Group 7.3 and the destroyer squadron personnel in conference agreed on the establishment of three surface weather stations designated as ALFA, BRAVO and CHARLIE. At first, these stations were manned on request of Joint Task Force SEVEN, sometimes one, sometimes two. As the operation progressed it became apparent that it was more desirable to man one ocean station continuously with another destroyer at Bikini to supplement USS BOXER for D-1 day observations, and a third destroyer at Eniwetok to supplement FRED observations.

In the early phases of the operation, weather destroyers were retired to a safe point south of the east-west centerline of the atolls on the night of D-1. This created a lack of critically needed weather information just at the time when it was most urgently required. Accordingly, another conference was held with the result that the weather destroyer was maintained on station during a shot and when necessary for as long as thirty hours thereafter. Information as to the best evasive courses to be steered in case fallout should swing towards the ship was provided to the Task Group Headquarters at PARRY by the Joint Task Force SEVEN Fallout Prediction Unit. This procedure was approved by the Task Group Commander and was placed in effect on 30 April 1958. Destroyer Division ELEVEN was relieved by Destroyer Division NINETY-ONE

[redacted]

[redacted] [redacted]

(3.6 Cont'd.)

on 12 May 1958. No difficulties in weather reporting were encountered in this relief.

3.7 ASW OPERATIONS

Two actual unidentified submarine contacts were encountered during the operational phase; one in the early and one in the latter part. The necessary aerial and surface support required to develop these contacts was considerable. Fortunately they occurred at relatively "slack" periods or they would have seriously interfered with and might have delayed the shot schedule. The first of these contacts occurred within the EPG danger area and CTG 7.3 was assigned direct responsibility for its development. The second occurred south and west of the Naval Station, Kwajalein and the Commanding Officer of the Naval Station was assigned responsibility. Aircraft under the operational control of CTG 7.3 were directed to assist the Commanding Officer, Naval Station, Kwajalein in developing this contact. Final evaluation of the first incident by CTF 34 was a possible submarine and the second by CTF 32 was a probable submarine. For further information on the contact within the EPG see CTG 7.3 first endorsement serial 0410 of 9 May to CO USS FLOYD B. PARKS serial 018 of 3 May 1958. By reason of the almost daily aerial surveillance of and the movement of destroyers and other surface craft in the danger area plus a considerable area surrounding it, it is believed that the possibility of additional foreign submarines being in the area during the operation was remote.

3.8 YUCCA

3.8.1 PLANNING

The concept and broad plan for the YUCCA event, a balloon borne high altitude (90,000 feet) of a small weapon, with the goals and general programs for which data was desired was laid out in the fall of 1956. Because of excessive winds and cumbersome handling equipment it was determined in the spring of 1957 that it was impractical to launch this balloon from the runway at Eniwetok. During the fall of 1957 trial balloons were launched from the USS BOXER off San Diego, proving the feasibility for this type launching. It was then determined that a series of trial flights would be conducted in the EPG during the month of March and the first three weeks of April. It was also

[redacted] [redacted]

[redacted] [redacted]

(3.8.1 Cont'd.)

determined that the BOXER would carry the command system, two diagnostic projects, the launch gear, and the timing and firing for this event. The aircraft participating in this event would also be controlled from an AOC located within the BOXER CIC, and last but not least, the BOXER through CTG 7.3 was charged with determining the exact position of BOXER at the time of detonation. Two other ships, a DDR and a DD (USS PERKINS and USS ORLECK) were to play major roles in this detonation.

3.8.2 TRAINING AND TESTING

In order to prove the adequacy of design, establish launching techniques, and to train personnel both scientific and naval in the performance of their tasks, a series of trial flights was conducted in the EPG during the months of March and April. Some of these tests were launching tests at which the balloon flight went only to 30,000 feet. In all, twelve such launching tests were conducted. The USS PERKINS and the USS ORLECK participated in three of these, plus the final event. The USS PERKINS was used as a backup for the BOXER in case delays would cause BOXER to lose radar contact with the balloon. The USS ORLECK was used as a weather data source of information and proved very valuable on the final run. The twelve trial flights enabled project, command units, and inflation and launch teams to perfect their performance which in turn helped make this flight successful.

The minor problems encountered during the trial period were for the most part solved easily and quickly, however, one major problem arose during the final rehearsal. Some ten days prior to the YUCCA event the designated surface zero was changed to a position some 85 miles northeast of Eniwetok. This position had not been used in previous rehearsals and during the dress rehearsal serious electronic interference was encountered. It was believed that this interference had been located and eliminated prior to the YUCCA event.

3.8.3 OPERATION

The YUCCA event was the first shot of the HARDTACK series and was detonated on 28 April 1958. Some radio interference and an aircraft out of position at primary shot time caused a 40 minute delay in this event. During the 40 minute delay all transmitters below 300 megacycles within the EPG were

[redacted] [redacted]

(3.8.3 Cont'd.)

shut down. The interference was eliminated and the YUCCA event was completed without further incident.

3.9 WAHOO EVENT

3.9.1 PLANNING

The concept and broad plan for the WAHOO event, a deep water detonation of a nuclear depth charge, with the goals and general problems for which data was desired was stated by the Special Weapons Evaluation Test Group during the latter part of 1956. Upon return to Washington after Operation REDWING, Task Group 7.3 began its deliberation and study of this general outline to determine specific requirements and training areas and to tailor the broad scientific objectives to the practical aspects of seamanship and budgetary limitations. From the list of scientific projects tentatively planned it became apparent that the target group should consist of three destroyers, a sub-surface craft and a large merchant marine type hull. Following this determination specific problem areas were evolved. Experience in previous operations, where similar types of exercises had been attempted, had been unsuccessful, mainly for the reason that positioning of targets precisely in the open sea had presented problems for which no solution had been found. Here was a challenge, a challenge that could be, and was, met by the combined efforts of the most experienced seamen and engineers the Navy, within itself, could draw upon.

The validity of scientific data was dependent upon positioning of target array vessels with exactitude, and once positioned to remain so within narrow limits of tolerance until H-hour. Within the confines of a shallow lagoon or sheltered harbor the exercise would have been fairly easy. However, such was not the case, as WAHOO was a deep water detonation at 500 feet depth requiring that the ships be positioned in depths of water ranging from 400 to 800 fathoms in the open sea, with a maximum mooring leg in 1000 fathoms. Under this condition, wind, sea, currents and tides had to be known or accurately predicted and accounted for, and significant changes in any one of them could wreak havoc with the best laid plans.

After considerable discussion and evaluation of various approaches

[redacted]

(3.9.1 Cont'd)

it was agreed that the target array must be moored. Such a project had never before been considered feasible and was considered by many experienced hands as being impractical. The technical assistance of the Bureau of Ships was solicited, and in June of 1956 design work was started and proceeded through several testing and training exercises until March of 1957 when the design was finalized on an individual moor and work was commenced upon the complete and detailed plan for the entire array.

To provide a suitable working platform, protected from boarding seas, flush deck steel barges such as the Navy's 250-ton and 500-ton YCs were selected. Because of the great depths, conventional anchor cables of chain were ruled out. The anchor leg selected was a compound catenary of chain, cast iron clumps, and wire rope. For a mooring leg in 6,000 feet of water, as was required in one case in the outboard moor, a scope of 10,000 to 12,000 feet of wire rope, one inch in diameter together with a 4,700 pound clump, three shots of 1¼" stud link chain, and a 3,000 LWT anchor was tentatively decided upon. With drum flanges increased 6" in diameter on a fleet tug towing winch, the drum was found to have a maximum capacity of one inch diameter wire rope, without fittings, of 12,000 feet. This indicated a possible satisfactory solution, and design work was guided accordingly. Based upon static conditions, calculations indicated that a horizontal holding power at the anchor of at least 20,000 pounds could be obtained and provide a marginal safety factor of 1½ to 1 on the yield strength of 1" diameter standard improved plow steel galvanized wire rope.

In order to lay the 27 legs by the original array design it was determined that four ATFs and one ARS would be needed. These ships were subsequently assigned and deck winches and towing drums were modified as necessary to accommodate the 12,000 feet of one inch wire rope.

3.9.2 TRAINING AND TESTING

To prove the adequacy of design, establish mooring techniques and to train personnel in the tremendous tasks ahead, two practical exercises were conducted. The first of these tests was conducted in early March of 1957. One leg of the moor design was laid in the proposed WAHOO site, and strain

[redacted]

[redacted] [redacted]

(3.9.2 Cont'd.)

tests showed the complete adequacy of the design. The second test was performed off Barbers Point in early November 1957. On this occasion the YC-1354 was moored in 800 fathoms of water over a coral bottom in a complete three-leg fixed moor. The surface zero buoy was also moored in this area in 500 fathoms of water and a dummy weapon was lowered and retrieved. Participating in this exercise were the fleet tugs MOCTOBI and TAKELMA and the salvage and rescue vessel GRASP. The MOCTOBI and TAKELMA were responsible for laying the moors, while the GRASP was charged with handling the weapon and assisting, where required, with the mooring. This test was outstandingly successful and proved that the design features of the complete mooring were adequate. It remained to be seen whether the factors of wind and sea at the site selected in the EPG for WAHOO had been correctly predicted and would not adversely affect or hinder the project.

Valuable training and experience was gained through both of these exercises and the three ships participating in the Barbers Point test were programmed for participation in HARDTACK. Unfortunately, the majority of the personnel, including the commanding officers of these three ships, were transferred prior to commencement of HARDTACK for the purpose of gaining personnel stability for the duration of the Operation. However, excellent replacements were assigned and they gained experience rapidly in the EPG.

3.9.3 OPERATION

Broadly stated, mooring was to be accomplished by laying moors for the eight YC and BC barges with either three or four legs consisting of wire, chain, etc., mentioned previously. The requirement to position two of the target array ships broadside to the prevailing wind dictated use of four standard mooring buoys in addition to the barges, for these ships. This series of moors to which the target array was to be fixed could be laid at any time prior to the scheduled event with the target ships fixed just prior to event time. In addition to the barges the zero buoy with its instrument barge had to be incorporated in the mooring array.

Procurement, manufacture, assembly and lift of material for the moorings progressed rapidly. Assistance in this respect by the Long Beach

[redacted] [redacted]

[redacted]

(3.9.3 Cont'd)

Naval Shipyard, the Pearl Harbor Naval Shipyard and the Naval Repair Facility, San Diego was solicited. The wholehearted and conscientious support of this effort by these activities was greatly appreciated and facilitated the timely and efficient completion of the event.

On 21 March moor laying was begun and the zero buoy was laid. Several significant unforeseen problems arose or became apparent in the early stages of the effort. These problems were quickly and effectively overcome, but required the retrieving of several legs, the loss of several legs and the laying of additional legs and buoys. All of these delays accounted for one day's delay in scheduled shot time. The EC-2 was placed in the mooring array two days prior to shot time, the three destroyers one day prior.

It had originally been planned to place the target ships in the array several days prior to the event. However, wind and sea conditions throughout the mooring operation were more severe than expected. This made success of the operation marginal.

Original planning called for the submarine BONITA to be moored in the array in an unmanned condition and submerged to periscope depth at a distance of 10,500 feet from ground zero. Due to heavy seas and adverse weather it was considered that the BONITA could not be positioned between the two YC mooring barges with safety. AFSWP was requested to authorize a change in plans which called for the BONITA to be manned at periscope depth a distance of 12,500 feet from ground zero. To provide an additional safety factor, however, the position eventually approved for BONITA was 18,000 feet from ground zero.

WAHOO was detonated on 16 May 1958 and all target array ships were within limits of tolerance. Retrieving of targets was completed on 17 May and all YCs, BCs, and buoys except for the zero buoy, were retrieved on 18 May.

A detailed chronology of events for WAHOO is enclosed as Appendix 1 of this report.

3.10 UMBRELLA EVENT

3.10.1 PLANNING

This event, a companion shot to WAHOO, was designed to furnish

[redacted]

[redacted]

(3.10.1 Cont'd.)

weapon effects data for targets in water similar to that found on the continental shelf of the United States or in other relatively shallow waters. Targets for this event were the same as those used for WAHOO with the addition of the SQUAW-29 and its associated YFNB-12. The BONITA, instead of being manned, as was the case in the WAHOO event, was moored unmanned at periscope depth 2900 feet from ground zero, combat rigged with torpedo doors open. Planning for the mooring of the target array presented no problems not already experience in normal harbor moorings where buoys with three legged moors are used. In addition to the weapon effects data to be determined from the moored target array, an additional task was assigned requiring the laying of four mine fields involving a total of approximately 140 mines. This program was incorporated in the planning for the operation with little difficulty.

Pre-event planning required detailed plans for the recovery of approximately 120 floating sampling devices from within the target array subsequent to the shot. To meet this problem HRS-3 helicopters in coordination with small surface craft were organized and assigned to a Recovery Task Element.

Experience gained in the WAHOO event, where timing signal failures in two of the target array ships caused a loss of primary data, was responsible for new procedures used in UMBRELLA. This is fully described in Section 6 of this report.

3.10.2 TRAINING

Inasmuch as the mooring techniques to be used were standard within the Navy no particular training problems arose in this area. The unmanned submerged mooring of the BONITA, however, posed a training problem, as nothing comparable had ever been attempted before. Two manned and one unmanned training dives were conducted with the BONITA. Recalculation of buoyancy problems of the SQUAW and several training dives were required because of the change in water density between the Eniwetok lagoon and San Diego harbor where the buoyancy had originally been calculated. Recovery problems subsequent to the shot also imposed obvious diver training problems. The training required to effect

[redacted]

(3.10.2 Cont'd.)

the moors of the BONITA and SQUAW and their subsequent recovery was accomplished successfully in the short time between the WAHOO and UMBRELLA events.

3.10.3 OPERATION

From data furnished by the Placement Board of Task Group 7.1 the moors for the UMBRELLA array were placed in the Eniwetok lagoon in February 1958. Subsequent to WAHOO event the data received dictated a reappraisal of placement of target ships in the array. This new placement required the retrieving of the original UMBRELLA mooring array and complete relaying of the installation. The experience resulting from the WAHOO event among the personnel of the ATFs and ARS enabled this task of retrieving and relaying to be accomplished expeditiously and without delay in shot schedule. Approximately ten days prior to shot time relaying the moor was commenced with the zero buoy, a standard three legged moor of a telephone buoy. Originally it had been intended that the telemetering data associated with the zero buoy would be done from equipment installed in a standard LCM moored to the telephone buoy. It was found that the antenna array was too large to be accommodated in the LCM and so an LCU was moored to the buoy and the LCM placed inside. Commencing several days prior to shot time, after the moor had been relaid, work was started on mooring the individual target array ships in the array and this work was completed prior to shot day except for the BONITA. This target ship was tested in the array along with the others, however it was not submerged in position until the day of the event.

Planting of the four mine fields proceeded according to plan and no unforeseen problems occurred. In addition, installation of other various instrumentation buoys and sampling devices (coracles) progressed concurrent with the placing of the target array ships within the array. On the morning immediately prior to H-hour, balloons with their sampling devices were launched and the ninety odd floating film packs were sown in the target array.

3.10.4 RECOVERY

The most immediate concern after the event was the recovery of all test equipment and sampling devices. This was effected promptly and efficiently

(3.10.4 Cont'd.)

by the recovery task element. Ninety-five percent of all these data gathering devices were recovered. This was a marked improvement over WAHOO and is a source of considerable pride to this Task Group.

Recovery of targets, buoys, anchors and cables was commenced as soon as possible after the event, and was completed approximately two weeks later with the loss of only the zero buoy, the LCU and one of the zero buoy anchors. Detailed chronology of the events is appended to this report as Appendix 2.

3.11 AIR OPERATIONS

3.11.1 SECURITY SEARCHES

Patrol Squadron TWENTY-EIGHT, home ported at NAS, Barbers Point, T.H., provided security search of the danger area and operated out of the U.S. Naval Station, Kwajalein with twelve P2V-5F aircraft augmented by a four plane detachment from VP-22. The four VP-22 aircraft were under the operational control of VP-28; administrative control being retained by VP-22.

On D-3 and D-2 days CJTF SEVEN informed CTG 7.3 of the sectors to search for D-2 and D-1 respectively. These sectors were based upon the predicted fallout pattern. Deputy CTG 7.3 in USS BOXER, who directed the security patrols, then informed VP-28 at Kwajalein of the specific areas to search. Since the patrols normally ceased ten to twelve hours prior to shot time the hazardous area was expanded 120 miles in all directions around the area desired clear at shot time in order to detect and warn surface craft that might stand into danger during the uncovered period before a shot. Because of the irregular shaped fallout pattern, danger sectors proved difficult to search by any known efficient or effective search patterns. A circular search pattern was used generally to give complete coverage. These patterns were centered at the atolls and were easy to describe in messages to VP-28. The squadron worked out their search plans for circular search areas having various radii. This also made it easy to change or shift search areas readily during the search, particularly if time was of the essence, using base radio from USS BOXER to the squadron base radio at Kwajalein; and to the airborne aircraft. For details

(3.11.1 Cont'd)

and numbers of unauthorized surface craft detected in the EPG danger area during surveillance searches see CTG 7.3 Confidential letter serial 0525 of 16 September 1958.

During the latter phases of the Operation when the BOXER departed the EPG for NEWSREEL, surveillance searches and flight following were conducted ashore at PARRY Island from an Air Plot, with its base radio, established in the Air Force Weather Communications Facility. This Air Plot although integrated physically with the Air Force Communication Facility was controlled and directed by Task Group 7.3. Essentially the same procedures were followed as aboard the BOXER and no new problems were introduced.

3.11.2 HELICOPTER SUPPORT OPERATIONS

As in the case of the preceding operations the Navy was assigned the Joint Task Force helicopter lift support requirement at Bikini. HMR(L)-361 with fifteen HRS-3s was assigned to Task Group 7.3 to carry out this assignment.

Support operations involved the daily lifts from NAN Island to the various other islands in the Bikini Atoll as required for weapon placement and installation of scientific equipment prior to each event, and the recovery of test equipment subsequent to each event. In addition, this squadron conducted many of the post-shot radiological safety flights for Bikini events. On two occasions a detachment of HMR(L)-361 operated from the USS MONTICELLO and USS BOXER in support of the scientific data recovery effort at Eniwetok.

3.12 AIRCRAFT CONTROL AND FLIGHT SAFETY

Commander Task Group 7.4 was responsible for air traffic control of all aircraft within the air control area of the Eniwetok Proving Ground. The control area consisted of 100 nautical mile circles centered in Eniwetok and Bikini lagoons, joined by straight line tangents on the north and south. All aircraft entering the control area were required to have prior clearance from the Air Force Air Operations Center before entering. The time involved in requesting and screening clearances initially hampered VP-28 search missions operating out of Kwajalein on operational flights within the control area. In order to expedite the P2V search missions operating within this area and to provide aircraft separation and control for safety of flight reasons, a letter of agreement was drawn up between Commander Task Group 7.4, Commander Task Group 7.3, Kwajalein Air Control Center and the Commanding Officer of VP-28. This agreement provided for clearance into the control area, altitude separation, reporting procedures, flight filing and rapid passing of aircraft position information between all agencies concerned. Subsequent to this letter of agreement flight clearance for the P2Vs worked smoothly and effectively.

3.13 AIRCRAFT MAINTENANCE

The basis for aircraft maintenance to support the Navy air units was COMNAVAIRPAC NOTICE 04400 of 10 October 1957. The Notice directed the squadrons to furnish all the necessary supply support information to conduct flight operations on a self-supporting basis for 180 days, and delineated responsibilities to the various commands and the Navy supply system.

The advanced echelon of HMR(L)-361 arrived at Bikini on 26 January 1958 and was operational on a self-supporting basis on 29 January 1958. The main body left at Santa Ana, California conducted their maintenance by borrowing special tools from other squadrons on the Air Station. In late May 1958 planning began for NEWSREEL at Johnston Island by requisitioning special maintenance tools through the USS BOXER to support the squadron, which was to be divided into two groups for continued operations at Bikini and Johnston Island.

There were no unusual maintenance problems encountered. The two main contributing factors to this excellent condition being the outstanding

(3.13 Cont'd.)

supply support rendered by USS BOXER and the conduct of operations and maintenance ashore at both Kwajalein and NAN Island.

3.14 SUPPORT AIRCRAFT

In September 1957 CJTF SEVEN outlined requirements for support of off-atoll weather and radiological safety stations, including logistic support by air. The Chief of Naval Operations stated that the aircraft requirement for logistic support of weather and radiological safety stations was met by U.S. Air Force assignment of seven SA-16 aircraft at Eniwetok. However, as the actual requirement was to commence on 15 October rather than in late February, and the fact that the Commander Task Group 7.4 SA-16 aircraft would not be in the EPG until mid-February, it was necessary to provide three additional UF aircraft at Kwajalein. One of these aircraft reached Kwajalein on 23 November, one on 3 December and two on 15 December. A fourth UF replaced one of Kwajalein's five UFs damaged in an accident.

The utilization of the UF aircraft for the weather and radiological safety station building phase for the periods 15 October 1957 to 31 January 1958 is as follows:

a. Flights requested by AEC - 48.

b. Flights conducted for AEC - 14.

c. Flights cancelled by CO NavSta Kwaj - 3.

(Non-availability of aircraft)

3.15 PILOT PROFICIENCY AND AIR TRANSPORTATION

CTG 7.3 was required to provide two UF-1 aircraft for pilot proficiency of Staff and USS BOXER pilots. Two UF-1 aircraft were stationed at Bikini through the month of March; these had two pilots per aircraft. During April only one UF was available due to shortage of qualified pilots from Kwajalein. CTG 7.3 assisted Kwajalein in getting additional pilots to augment the Bikini UF requirement and further requested that only one qualified plane commander pilot per aircraft be furnished. During May and June two aircraft with one pilot per aircraft were provided at Bikini. These aircraft were utilized by USS BOXER and Staff pilots for proficiency flying in addition to providing SAR capability, rapid and timely transportation for CTG 7.3 and

(3.15 Cont'd.)

Staff between Bikini and Eniwetok, and expediting official and U.S. mail between Eniwetok, Bikini and Kwajalein. These aircraft assisted Commander Task Group 7.4 in his mission of off-atoll support of the radsafe and weather stations on two occasions. Additionally, these aircraft conducted two aerial photo reconnaissance missions to survey four uninhabited atolls; a mission requested by Commander in Chief, U.S. Pacific Fleet and Commander Hawaiian Sea Frontier.

3.16 SEARCH AND RESCUE

The search and rescue procedures were patterned after Annex S, Commander Hawaiian Sea Frontier Operation Order 201-57 and Annex S, Commander in Chief, U.S. Pacific Fleet Operation Order 201-58 and were coordinated with Commander Task Group 7.4 who had overall SAR responsibility within the Eniwetok Air Control Area. SOPA (Admin) Eniwetok, the Destroyer Squadron Commander, was designated as CTG 7.3 representative in SAR matters. Requests by the Task Group 7.4 SAR Commander for surface or air SAR assistance from CTG 7.3 were made to SOPA (Admin) who alerted and coordinated Task Group 7.3 forces. Commanding Officer, U.S. Naval Station, Kwajalein retained SAR responsibilities outside of the Eniwetok Air Control Area, including Wake.

A destroyer or fleet tug was stationed about seven miles east of the runway at Eniwetok for SAR duty on all rehearsal and shot days. Deputy CTG 7.3 in USS BOXER at Bikini had one and sometimes two UF-1 aircraft at Bikini to assist in SAR if necessary. The HMR(L)-361 at Bikini always had at least two HRS-3 helicopters that were readily available for local SAR assistance. VP-28 at Kwajalein kept one P2V on forty-five minutes standby alert around the clock for SAR duty, particularly to intercept or to search long range for their patrolling aircraft if necessary. VP-28 at Kwajalein maintained base radio for flight following their aircraft. Deputy CTG 7.3 in USS BOXER directed, monitored and flight followed all flights over base radio located in USS BOXER. The radio link between USS BOXER, the squadron and the aircraft enabled all to be alerted immediately in case SAR became necessary. The duties of the BOXER were taken over by a base radio unit at Eniwetok when BOXER departed for NEWSREEL.

PATRON TWENTY-EIGHT -- OPERATIONAL STATISTICAL SUMMARY

Month	A A/C Assgn	B Avail-ability	C Patrols	D Aerial Reconn	E Proj Fall out	F ASW and Escort	G Misc	H Total Sorties	H Total Hours	H Accm Hours
Apr	16	87.3	80	649.0	-	214.6	84.2	143	946.8	*146.7 *1093.5
May	16	82.1	149	933.7	83.1	-	91.8	195	1108.0	2201.5
Jun	16	83.7	120	-	-	-	76.0	206	1106.8	3307.4
Jul	12	84.7	73	70.8	-	-	50.3	150	872.5	4335.8
Aug	12	74.6	29	-	-	-	29.0	58	321.7	4675.5

Item C - Includes general surveillance, extended and concentrated searches.

Item D - Aerial reconnaissance flights.

Item E - Includes special project aerial radiosafe flights.

Item F - Includes escort and ASW.

Item G - Includes training, test, SAR, administrative, etc.

*Cumulative total includes transpac from Barbers Point to Kwajalein not reported elsewhere.

HMR(L)-361 -- OPERATIONAL STATISTICAL SUMMARY

1	2	3	4	5	6	7	8	9	10	11	12	13
Month	Number A/C Assigned	Percent A/C in Commission	Number of Sorties	Number of Hours	Scientific Data Recoveries Sorties	Scientific Data Recoveries Hours	Misc. Hours	TOTAL Sorties	TOTAL Hours	AVGAS Gal.	AVOIL Gal.	Accidents
Jan	7	80	63	37.9	0	0	29.9	63	67.8	2130	51	0
Feb	7	94	679	409.4	1	2.9	89.4	680	501.6	18620	458.5	0
Mar	15	82.5	2284	1038.7	0	0	114.2	2284	1152.9	42166	1114	1
Apr	15	74	3049	1112.9	2	1.8	45.0	3051	1159.7	43336	1279	0
May	15	79	2041	939.4	38	52.8	55.4	2079	1047.6	37566	1013	0
1-15 June	15	87	649	336.9	38	54.8	32.8	687	424.5	13394	325	0
16-30 June	15	87.5	618	271.8	20	36.3	8.7	638	316.8			0
July	15	93.1	467	67.4	29	41.8	13.5	496	256.7			0

Column - 4 - Operational flights exclude column 6.
5 - Operational flights exclude columns 7 and 8.
6 - Scientific data recovery flights exclude columns 4 and 8.
7 - Scientific data recovery flights exclude columns 5 and 8.
8 - Pilot training, tests, SAR, etc., where passenger/cargo not involved.
9 - Total sorties include columns 4 and 6.
10 - Total flight hours include columns 5, 7 and 8.

[redacted]

3.17 RADIOLOGICAL SAFETY

3.17.1 ORGANIZATION

The organization of Task Group 7.3 for radiological safety proved completely adequate and was based on existing shipboard and unit Damage Control and Atomic Biological and Chemical Defense (ABCD) organization implemented by further instructions from a Staff briefing team.

3.17.2 PLANNING

The Assistant Plans and Operations Officer (Atomic Defense) was relieved in early July 1957. This was not a contact relief and posed certain problems in coordinating the planning.

Material requirements for radiological safety were promulgated to all ships and units who were required to pay for these items from their quarterly operating allotments. In addition to the supplies required for the ships, an extra supply of materials was purchased by the Staff. This backup material proved necessary to implement those items carried by the ships, especially on shots WAHOO and UMBRELLA when a greater than usual amount of protective clothing was required.

A special unit consisting of 200 enlisted men and one officer was established as the Task Group 7.3 Decontamination Unit. Their specific function was to be prepared to decontaminate the target ships after shots WAHOO and UMBRELLA.

There were no billets in the Staff allowance for radiac instrument repairmen. Two of the instructors obtained from the Bureau of Naval Personnel were used in this capacity. Their presence was invaluable since most of the ships did not have personnel aboard qualified in radiac instrument maintenance.

3.17.3 TRAINING

The training of personnel of ships and units, except for the Decontamination Unit was conducted through the use of established naval schools ashore and a training program set up by the Staff. All ships and units were advised as to the recommended courses ashore. Late in the planning phase and early in the operational phase all ships and units were given instructions and briefings by the Staff Radiological Safety Officer, aided by two instructors obtained from the Bureau of Naval Personnel.

[redacted]

[redacted]

(3.17.3 Cont'd)

The two instructors used in the aforementioned training were two of seven petty officers obtained from various schools commands on temporary duty. The remaining five were used to aid in the training of the Decontamination Unit. Since all these men have since returned to their original duty stations to continue instructing , it is believed that their being assigned to the Staff on temporary additional duty was extremely valuable both to themselves and the naval establishment.

Training of the Decontamination Unit was accomplished by sending all the Unit's petty officers to a special course of instruction at the Naval Schools Command, Treasure Island. These petty officers in turn were used to train the entire Unit. The training of the Unit was conducted at the U.S. Naval Amphibious Base, Coronado, California.

The special course given at Treasure Island was of four weeks duration and was a new curriculum that was prepared jointly by Naval Schools Command, Treasure Island and Naval Radiological Defense Laboratory at the San Francisco Naval Shipyard. Preparation was coordinated through the Training Section of the Bureau of Naval Personnel.

3.17.4 PRECAUTIONS AND COUNTERMEASURES

"Interim" washdown systems were installed in all ships of Task Group 7.3 permanently assigned to the operation in the Eniwetok Proving Ground. No washdown was installed for ships that were in a transient status. All washdown systems were very effective in reducing the contamination that was experienced during one instance of relatively significant fallout.

Radiac instrument allowances of ships and units were adequate and satisfactory for the situations encountered except for the capability of evaluating the beta component of combined beta-gamma intensities greater than 5 mr/hr. Arrangements were made through the Bureau of Ships to bring all ships assigned to Operation HARDTACK up to 100% of allowed instruments. All ships arrived in the EPG with a complete allowance of instruments. Since HMR(L)-361 and VP-28 had no established allowance of instruments, an allowance was established and the necessary instruments procured through the Bureau of Ships. All ships and units were advised to procure 100% spare parts and batteries. In

[redacted]

(3.17.4 Cont'd.)

addition to this, arrangements were made to have another 100% of spare batteries available at the Naval Supply Center, Pearl Harbor for issue to ships. In the main, 100% spare batteries was sufficient and only a few units required re-ordering.

In view of their remote location at Kwajalein during the operation, VP-28 set up their own instrument repair facility and no troubles were encountered.

A radiation source for instrument calibration was obtained. However, it was found that the calibrating range of Task Unit 6 of Task Group 7.1 could be used and consequently the obtained source was little used because of the difficulties in using a calibration source aboard ship. Instruments were brought ashore for calibrating.

The film badge dosimetry program for Joint Task Force SEVEN was a primary function of Task Unit 6 of Task Group 7.1. Film badges and associated record cards were obtained from Task Unit 6 and distributed to all ships and units of Task Group 7.3, together with instructions concerning issue, wearing and executing record cards.

No Task Group 7.3 personnel received greater than the allowable maximum permissible dose of five roentgens for the entire Operation.

3.17.5 OPERATIONS

All ships and units were deployed at such a distance from all shots so that complete protection was afforded from blast, shock, initial radiation, and thermal effects. No special clothing at shot time was required except for the OAK, PINE, and ORANGE events when long sleeve shirts and long trousers were required. There were two total evacuation shots, both at Bikini. For all other shots the ships remained in their normal anchorages and personnel stationed ashore remained ashore. At Bikini, personnel from some up-atoll islands were evacuated to the USNS AINSWORTH for a few shots as adequate facilities ashore were not available.

The only shot time hazard was from the initial flash. Positive control of all personnel was maintained by requiring that all personnel be at a countdown station at least 30 minutes prior to shot time. One thousand pairs

(3.17.5 Cont'd.)

of high density goggles were obtained and distributed to all units. All personnel within line of sight of the detonation were required to wear high density goggles or face away from the blast.

After each detonation, close liaison was maintained by the Staff Radiological Safety Officer with Joint Task Force SEVEN Radiological Safety Center. This allowed for early passing of re-entry information and for securing ships from emergency standby for evacuation as soon as possible. The Staff Radiological Safety Officer was based ashore at ELMER. This permitted the required liaison and coordination with radiological safety personnel from other Task Groups along with Joint Task Force SEVEN Radiological Safety Center.

Trips were made to Bikini at intervals throughout the Operation to maintain liaison with the units located there.

The distillation of fresh water by the ships in the lagoons at both Bikini and Eniwetok presented no problem. Close watch was maintained on the contamination levels in the lagoon, especially after the underwater shots. At no time was it necessary to secure ships' distillation plants. Samples of potable water were taken and analyzed periodically as required. No significant radioactivity was found in any of these samples.

Only one instance of significant fallout was encountered. During this fallout the level ashore at ELMER reached 30 mr/hr. Aboard the ships, levels were less than this value since decontamination procedures were instituted early.

The decontamination of the target ships used in shots WAHOO and UMBRELLA was the duty of the Task Group 7.3 Decontamination Unit. No particular difficulties were encountered. The unit was well trained and carried out their assigned mission smartly and efficiently. Since the contamination levels on the targets were considerably less than those predicted, the size of the unit was somewhat excessive. However, this could not be foreseen as there were no previous shots of this sort from which experience could be drawn. The Decontamination Unit also furnished technical assistance to ships and units participating in shots WAHOO and UMBRELLA. They furnished a pool of well qualified monitors who were extremely valuable. This unit operated a personnel decontami-

(3.17.5 Cont'd.)

nation station aboard the assigned APA. This decontamination station proved most satisfactory in furnishing a station close to the target ships for personnel returning from recovery missions. The targets were at too great a distance to allow for the use of facilities ashore.

P2V fixed wing aircraft were used for early radiological survey and radiological barrier patrols. Only portable field type instruments were used. Such a survey of the entire atoll and adjacent areas can be started immediately after local fallout has ceased and the radioactive cloud has moved out of the area. This gives a very rapid means of obtaining the radiological picture and allows for early declaration of re-entry hour.

3.18 DIVING

3.18.1 GENERAL

Diving support requirements for Operation HARDTACK were extensive, particularly for the WAHOO and UMBRELLA events. Placement and recovery of mines and underwater instruments, assistance with recovery of mooring array and underwater repair and salvage were of prime consideration. The additional capability for ship salvage and repair had to be maintained for the duration of the operation.

3.18.2 PLANNING

Once the preliminary plans for WAHOO and UMBRELLA were known estimates of material, ship and personnel diving support could be established. It was anticipated that two ARSs and one ASR could fulfill the requirements for WAHOO and UMBRELLA.

Personnel-wise, in order to meet the peak load during WAHOO and UMBRELLA, a diving medical officer, an additional qualified diving officer and a total of 81 qualified enlisted divers were required. This included a special diving team, exclusive of those assigned to the ships, of one officer and eight enlisted.

Material required, in addition to that normally carried aboard the ships, was estimated and either requisitioned through normal service supply channels or obtained through open purchase.

[redacted]

3.18.3 TRAINING

Prior to deployment, the Staff Diving Medical Officer attended the Special Weapons Orientation Course at Sandia Base, Albuquerque, New Mexico.

No specialized training for officers and enlisted was conducted prior to deployment to the EPG, as all personnel involved had been trained and qualified as divers.

Once in the EPG instruction sessions concerning the use of new navy decompression tables were conducted for the diving team and for the diving personnel of the ships. All divers unfortunately were not instructed due to the exceedingly heavy work schedule. In addition, lectures and sessions on the handling of diving accidents, general first aid, local marine life hazards and general safety were conducted when conditions permitted.

3.18.4 OPERATIONS

Over 800 hours of underwater work were actually required. However, actual working time ("bottom time") of reported dives totalled only 566 hours. The difference is accounted for by time spent in decompression (ascent and decompression stops), necessarily a large factor in dives to around 150 feet -- the average depth of the lagoon in areas where much diving was required. The total number of reported dives was 1560. Of these, 686 required decompression. Most dives were either in the neighborhood of 150 feet or less than 30 feet, as in underwater work on ships. Most of the deeper dives were long enough to require decompression. It is believed that all dives were reported except a relatively small number involving ship repairs at shallow depth.

As anticipated, the predominant portion of diving was devoted to the support of projects, i.e., placement and recovery of mines and instruments. Except in the case of some project instruments, which were used in the WAHOO event also, most of this work was related to UMBRELLA.

In addition to project support, a considerable diving effort was required for salvage and repair purposes. These included salvage of a barge and removal of the lead keel from the target SQUAW. Numerous smaller jobs such as removal of lines from screws, underwater ship inspections and repairs, and the like were accomplished.

Although diving conditions were extremely favorable as to water

[redacted]

(3.18.4 Cont'd.)

temperatures and visibility in most cases, strong winds and unexpectedly rough water were frequently encountered. These factors considerably increased the difficulty of diving, especially when small craft had to be used. The wind and current made it difficult and hazardous for divers to enter and leave the water.

With virtually no exceptions, Task Group 7.3 diving operations were conducted efficiently and according to plan. All commitments were fulfilled, and several unforeseen and unobligated project tasks were accomplished as well. At no time was any phase of the operation held up because diving was behind schedule.

A complete report of diving operations for Operation HARDTACK is appended as Appendix 3.

3.19 CONCLUSIONS

1. That the task organization of Task Group 7.3 as originally set forth in Operation Order 1-58 proved to be satisfactory but the number of individual units is considered excessive.

2. That use of a Deputy Commander Task Group 7.3 was well warranted due to the nature of this operation.

3. Assignment of ships within the task organization cannot be made until all elements of the operation are known and firm.

4. That use of destroyers as mobile weather stations has proved to be of utmost value to the Joint Task Force Weather Central in two successive test operations.

5. That communications interference cause many problems when arming and firing from aboard ship.

6. That instead of searching the entire danger area on D-4 and D-2 as set forth in CTG 7.3 Operation Order 1-58, the D-2 and D-1 search of significant danger areas associated with each shot proved to be more efficient and effective for insuring security of the area.

7. That the patrol squadron, operating within the provisions of the letter of agreement with the CTG 7.4, was able to carry out its assigned mission without delay.

(3.19 Cont'd.)

8. That early planning and visits of Staff and squadron personnel to the operating areas two to three months prior to deployment results in a clear understanding of the problems to be solved.

9. That it is evident that the anticipated requirements given to the U.S. Naval Station, Kwajalein for a minimum of three support flights per week for the period 15 December through mid-February 1958 was excessive.

10. That the UF-1 aircraft provided valuable support and assisted CTG 7.3 materially in carrying out his mission.

11. That "Search and Rescue" procedures and facilities were adequate.

12. That visits to ships and units should be conducted more frequently, earlier, and for longer durations than was possible for Operation HARDTACK.

13. That continuity between operations is highly desirable in filling all Staff billets.

14. That no difficulties were encountered in radsafe logistic requirements. Ships and units arrived with sufficient equipment and spares for the Operation.

15. That radsafe training for future operations should be patterned along the lines of the course conducted at Treasure Island for the Decontamination Unit personnel.

16. That the participation of personnel from ADCD training activities in the test was very successful and valuable.

17. That radsafe training as conducted and received by ships and units was adequate for the situations met in the operation.

18. That the state of readiness in radiological safety of all participating naval units was improved as a result of their participation.

19. That washdown systems are a required countermeasure for all ships participating in nuclear test operations and can be very effective if properly employed.

20. That the AN/PDR-27 series and AN/PDR-18 series instruments are very reliable and satisfactory for most needs. Ships radiac instrument allow-

[redacted]

(3.19 Cont'd.)

ance was adequate. A medium range beta-gamma instrument was not available to the ships.

21. That procurement of radiac spares and batteries was satisfactory.

22. That the procedures followed in obtaining and distributing film badges was satisfactory.

23. That decontamination of ships and barges can be successfully accomplished by use of naval personnel and no elaborate facilities are required. The facilities available aboard an APA type vessel with some slight locally accomplished modifications are entirely adequate. All modifications can be of a temporary nature.

24. That planning for Task Group 7.3 diving capability during Operation HARDTACK was adequate in almost all respects.

25. That adherence to essentially the same diving plans and approach should prove adequate in a future operation of similar characteristics.

26. That the number of ships and divers available during Operation HARDTACK were appropriate for the requirements.

27. That the special "diving team" was particularly useful, but its effectiveness and safety could have been increased by certain changes.

28. That the use of the new U.S. Navy Decompression Tables not only expedited diving operations significantly but produced a very low incidence of decompression sickness. In addition to making Task Group 7.3 diving more efficient, use of the tables in this Operation also advanced navy diving as a whole by providing field-validation for the tables.

29. That the incidence of all diving accidents and other medical conditions affecting divers was extremely low.

30. That underwater radiation proved to be an almost negligible problem. Dosage received by divers was small even in the limited areas where significant radiation levels were found. However, the possibility of more serious problems as a result of somewhat different circumstances in future operations should not be ignored.

31. That the "Divers Radiological Safety Instruction" that was issued should be applied, at least in its essentials in future operations.

[redacted]

[redacted]

(3.19 Cont'd.)

32. That the AN/PDR-50(XN-1) radiac sets proved satisfactory for all underwater radiac measurements that were required. A few minor modifications would increase their value.

33. That one or two properly designed diver-held radiac meters would be desirable adjunct for use as standby or for special problems.

34. That DuPont Dosimeter Film Packets, Type 559, with rigid acetate cases, proved highly satisfactory for use by divers.

35. That the register of divers, records of dives made, and divers' radiation exposure records kept during Operation HARDTACK were valuable. However, success of the new decompression tables removes the need for detailed diving data in the future. Extensive transcription and tabulation can be eliminated.

36. Divers' annual physicals and other matters related to diver qualifications should be done before ships depart for the EPG.

37. That sessions of instruction and review by the Diving Medical Officer should be conducted.

38. The importance of competent diving hospital corpsmen cannot be over-estimated. One must be aboard each major diving ship, and one member of the "diving team" should be a diving corpsman.

39. That provision for at least one 2-lock recompression chamber, to be present throughout the duration of deep or extensive diving, should be made in future operations.

40. That in an operation that requires diving activity approaching the extent and nature of that in Operation HARDTACK, the presence of a Medical Officer adequately qualified in diving is mandatory.

3.20 RECOMMENDATIONS

1. That the practice of assigning the Commander Task Group 7.3 as Deputy Commander Navy for Joint Task Force SEVEN should not be continued but rather this billet should be established as a separate billet.

2. That all Naval and Military Sea Transportation Service (MSTS) forces should be under either the operational or movement control of CTG 7.3 during the operational phase.

3. That areas assigned and used during all practices should be the same as for the actual event.

[redacted]

(3.20 Cont'd)

4. Greater effort should be made to assure that all hands are thoroughly indoctrinated in the precautions to take at shot time.

5. That assigned ships should set up positive procedures to be used by shipboard decontamination monitoring teams.

6. That the task organization of the Task Group be reduced to five units in future operations.

7. A Deputy Task Group Commander should be appointed for this type of operation.

8. The use of destroyers as mobile weather stations be planned for in future operations and early action be initiated to insure assignment of adequate forces for this important task.

9. That communications checks be run in areas to be used well in advance of actual events.

10. That air search procedures used on HARDTACK be used on future operations.

11. That air control procedures should be worked out between all agencies concerned prior to arrival in the EPG.

12. That helicopter operations be conducted ashore with only very limited maintenance to be done aboard ship.

13. That a more accurate estimate for early aircraft support, particularly for aircraft based outside the EPG at Kwajalein, be made known to CTG 7.3 as early as possible during the planning phase.

14. That search and rescue procedures be tailored after HARDTACK procedures.

15. That the marine helicopter squadron have a qualified flight surgeon assigned ashore, especially where an advanced echelon is in place early with no other aviation medical officer available.

16. That marine helicopter squadron assigned should train all pilots in pick-up technique using open nets, grappling hooks and "chicken foot" hooks prior to deployment.

17. That certain key Staff billets should be contact relief during the operational period.

[redacted]

(3.20 Cont'd.)

18. That increased participation by instructor - observers from the Bureau of Naval Personnel training activities be planned and requested.

19. That two qualified radiac instrument repairmen be assigned to the Staff for the duration of the operation.

20. That a dehumidified space ashore be assigned as a radiac repair shop.

21. That a training program similar to that given the Decontamination Unit be made a new curriculum at Naval Schools Command and Fleet Training Centers.

22. That two instructors be assigned to the Staff during the operation to conduct radiological training aboard assigned ships and units.

23. That continued emphasis be placed on radiological safety preparedness.

24. That washdown systems continue to be required for all ships participating in nuclear tests.

25. That a suitable medium range beta-gamma instrument be furnished to all ships assigned the operation for personnel monitoring.

26. That in the event of future underwater shots of the scope of WAHOO and UMBRELLA a special Decontamination Unit be provided.

27. That an APA type ship continue to be used as the decontamination station.

28. That the use of fixed wing aircraft for early radiological survey be continued.

29. That the basic plans and arrangements concerning diving in Operation HARDTACK be followed.

30. That an LCU (with crane or equivalent) be provided as primary base of operations for diving operations.

31. That ready access to an adequate source of properly filtered compressed air for charging SCUBA cylinders be provided.

32. That the presence of a Medical Officer trained in diving is considered essential during diving operations.

33. That the Medical Officer be qualified as a submarine medical officer.

[redacted] [redacted]

(3.20 Cont'd.)

34. That the Diving Medical Officer not be assigned regular hospital or dispensary duty.

35. That availability of a 2-lock decompression chamber with adequate air supply be considered mandatory throughout the duration of extensive diving operations.

36. That the following equipment be acquired for underwater radiation measurements:

a. At least two AN/PDR-50(XN-1) pressure-proof probe instruments.

b. One or two pressure-housed radiac meters suitable for direct use by divers.

37. That DuPont Dosimeter Film Packets Type 559 with acetate cases be employed for determining exposure of divers underwater. If a different type of "film badge" is adopted for the Operation as a whole, that it be evaluated by the Experimental Diving Unit for suitability for use by divers.

APPENDICES:

1 - History of Deep Sea Mooring Aspects of WAHOO Event

2 - Chronological Record of UMBRELLA Array Mooring Operations

3 - Diving Operations Report

APPENDIX 1

HISTORY OF DEEP SEA MOORING ASPECTS OF WAHOO EVENT

SECTION I

1. Purpose.

The purpose of this report is to describe the equipment and operating procedures necessary to establish deep water moors in depths up to 6,000 feet.

2. Background.

a. To test the effects of a U. S. Navy nuclear depth charge in deep water, a series of moors had to be accurately positioned at prescribed distances to:

(1) Fix the exact position of and provide the means for the suspension of a nuclear depth charge.

(2) Provide platforms for the installation of blast measuring and other data collecting equipments at prescribed distances from the explosion.

(3) Provide moors for target ships.

b. This test was designated event WAHOO, Operation HARDTACK. The site chosen for the test was immediately to the southwest of Eniwetok Atoll.

c. Blast measuring equipment was to be installed at specified horizontal (seaward and shoreward) distances from the explosion site. Horizontal distances translated into water depths indicated that platforms, of some type, must be held in a fixed position in depths ranging from 2,000 to 5,000 feet at the platforms. This was achieved by means of anchors placed on the shore, for the shoreward platform, to depths of 6,000 feet for the most seaward platform.

d. A coral bottom existed throughout most of the area. Slope was fairly constant at 22° to all depths.

e. Differences in wind and sea from that predicted contributed materially to the difficulties encountered in placing the moor. Prevailing winds and sea for the period June through September were predicted as: Winds from 068°T force 10 to 15 knots and sea 6 to 10 feet. After the moor was designed and

tested, the WAHOO event was advanced 30 days, and resulted in the actual wind and sea being considerably different from that predicted. Generally, conditions during the mooring operation were: Wind variable 060°T to 110°T force 25 to 30 knots and sea 10 to 20 feet.

3. Experimental Phase.

a. To determine the practicability of establishing deep water moors, the Bureau of Ships conducted tests at Eniwetok and in the vicinity of Hawaii.

b. These tests proved that deep water moors

(1) were economically feasible,

(2) could be accomplished with existing ships and equipment,

(3) did not endanger ships or personnel.

4. Planning Phase.

a. Experiments had indicated that a deep water moor could he held in place by either three or four legs (depending upon the additional load). Conventional anchor chain was not used entirely because of the depth of water and the resulting strain of chain weight on winches to be used.

b. One inch steel wire rope was selected for the legs. To reduce the scope of the wire rope, a cast iron clump and three shots of anchor chain were added between the wire rope and the anchor.

c. In the interests of time and economy, all equipment utilized was standard Navy material except for the clump.

5. Types of Moors Utilized.

a. Zero Site.

The buoy selected as the zero buoy to suspend the nuclear depth charge was a standard 16 foot telephone buoy.

b. Target Moors.

(1) Sites 1, 2, 5, 6, 7.

U.S. Navy standard 250 ton YC barges, 110 feet by 34 feet.

(2) Sites 8, 9.

U.S. Army standard 250 ton BC barges, 110 feet by 32 feet.

(3) Site 4.

U.S. Navy standard 500 ton YC barge, 110 feet by 34 feet.

Primary difference between 250 ton YC barge and 250 ton BC barge was the depth of the hull. The 500 ton YC had same length and width as the 250 ton YC barge but had a larger cargo carrying capacity because of its greater depth.

(4) Special moors were used in conjunction with mooring the YCs in the EC-2 (Liberty Hull) and the DD-592.

These were standard 9 foot 6 inch diameter, 5 foot depth deep mooring buoy (four used).

6. Target Vessels.

EC-2 (Liberty hull).

DD-474.

DD-592.

DD-593.

SSK-3 (mooring not effected).

7. Operating Vessels.

a. ATF

USS CREE (ATF-84)

USS ARIKARA (ATF-98)

USS CHOWANOC (ATF-100)

USS MOCTOBI (ATF-105)

USS TAKELMA (ATF-113)

b. ARS

USS GRASP (ARS-24)

USS BOLSTER (ARS-38)

c. YTB

182

188

[redacted]

8. Mooring Equipment.

a. Anchors.

3,000 pound LWT anchor, holding power 60,000 pounds (used by most LSTs).

b. Clumps.

Cast iron, 30 inch by 30 inch by 20 inch, weight 4,700 pounds, with eye formed by 2 inch cast iron bar.

c. Chain Welded Steel.

One and one-fourth inch stud link chain, breaking strength 178,000 pounds, weight 1,400 pounds per shot (90 feet).

d. Wire Rope.

(1) Two types used:

(a) One inch standard improved plow steel galvanized wire rope, breaking strength 70,000 pounds (weight 1.5 lbs/foot).

(b) One inch Navy standard target tow wire rope, breaking strength 90,000 pounds (weight 1.5 lbs/foot).

e. Miscellaneous.

Eight inch manila rope, five inch manila rope, pelican hooks, carpenter stoppers, snatch blocks, Berger Fairlead sheaves, etc.

Swivel and detachable link fittings, rings and shackles necessary to secure anchor to chain to clump, etc.

9. Modifications and Additions to Existing Shipboard Equipment.

a. Only standard equipment installed on most ATFs was utilized with the following exception:

(1) As designed, the towing winch drum on the ATF was capable of carrying 10,000 feet of one inch wire rope. Inasmuch as larger scopes of wire rope were to be required, the diameter of the drum was increased by six inches to provide space for a maximum of 12,000 feet of one inch wire rope. Flanges were welded to the sides of the drum to permit this increased capacity. In some instances, deck equipment had to be removed to allow the drum to rotate freely.

[redacted]

[redacted]

b. YC and BC Barges.

(1) LSM gasoline driven stern anchor winch installed on each barge to facilitate handling of wire rope.

(2) Berger Fairlead sheaves, carpenter stoppers, snatch blocks, etc., as required.

(3) Brackets and braces required for the installation of blast and data measuring equipment.

c. EC-2 (Liberty Hull)

The EC-2 was unmanned, cold iron and only moveable parts were those for which temporary special rigging and power had been provided.

(1) Besides being a target vessel, the EC-2 loaded and transported all the mooring equipment required.

(2) A pay-off stand was designed by the Bureau of Ships and was installed on the forward deck of the EC-2.

The function of this stand was to prevent wire rope from unreeling from a spool of wire aboard the EC-2 faster than the tug winch could haul it in during the transfer process.

To insure that the winch aboard the tug was hauling in wire rope and reeling it in on her drum at a constant tension, a brake on the pay-off stand was set to provide the desired tension.

The stand consisted of two parallel vertical six foot high reinforced braces suspending a cross bar 4½ feet above the deck. A series of brakes, reduction gears and cutoff devices were attached. When the hauling-in tension dropped below about 3,500 pounds, the brake automatically prevented further unreeling.

Controlling of tension is a necessity when leading large scopes of wire rope to the hauling-in winch on the ATF. Unless the wire rope is carefully coiled on the drum, severe abrasions and kinking will result when the anchor and clump are lowered into the water. The heavy weight of the anchor, chain and clump will cause wire rope on the drum to be pulled down into spaces left by uneven or loose coiling at a lower level. This condition will also cause [redacted]

[redacted]

termittent jerking by the winch and anchor during the lowering process, setting up unnatural tensions leading to possible wire failure conditions.

10. Mooring Equipment Utilized (Approximate).

a. 300,000 feet of one inch wire rope.

b. Forty 3,000 pound LWT anchors.

c. Forty 4,700 pound cast iron clumps.

d. One hundred and twenty shots of 1½ inch stud link chain.

e. 40,000 feet of 3/4 inch wire rope.

The 3/4 inch wire rope was used exclusively with the zero mooring buoy.

11. Target Array.

a. Annex A is a chart indicating mooring sites, horizontal distances of targets, depths of water, scopes and bearings of legs (anchor, clump, chain and wire rope).

b. Information concerning bearings and scopes of legs are set forth as follows:

(1) Bearings (Section II, paragraph 2a, (1, 2, 3)).

(2) Scope.

(a) General information (Section II, paragraph 2a, (4)).

(b) Specific lengths of each leg (Section III).

12. Anchor, Chain, Clump, and Wire Rope Connections.

a. Arrangement.

(1) Anchor secured to one shot of chain.

(2) Other end of chain secured to ground ring.

(3) Clump secured to ground ring.

(4) One end of two shots of chain secured to ground ring.

(5) Wire rope secured to the free end of the two shots of chain.

b. Specific Fittings.

(1) See Annex B (drawings).

13. Preliminary Training.

Only the Fleet tugs MOCTOBI and TAKELMA, and salvage ship GRASP had previous training in deep water mooring, having participated in the experimental tests, (see paragraph 3). Fifty percent of the personnel of these two ships had been rotated since the previous tests, including all commanding officers.

SECTION II

Procedures in Establishing Moor

1. Method of Transferring Mooring Equipment from EC-2 to ATF.

a. Pre-mooring.

(1) The EC-2 set reel of wire rope (6,000 to 10,000 feet) in position on pay-off stand.

(2) The ATF moored starboard side to EC-2 port side.

b. Transfer of Equipment.

(1) Wire rope was led from pay-off stand on forecastle through several snatch blocks and suspended fairleads, aft to port quarter closed chock on EC-2. Wire rope led through the closed chock, down and forward through ATF stern rollers through spooling device and secured to drum of towing machines.

(2) ATF commenced hauling in. (Hauling in speed averaged about 2,000 feet per hour.)

(3) Pay-off stand function and hauling in problem previously described in Section I, paragraph 9c(2).

(4) Upon completion of hauling process, clump and ground ring attachment lowered by EC-2 boom and held outboard of ATF stern rollers.

(5) Clump secured at stern rollers by carpenter stoppers.

(6) Two shots of chain lowered and faked down on ATF fantail.

(7) Anchor lowered and secured outboard of starboard quarter gunwales of ATF with five inch manila line.

(8) One shot of chain lowered and held in bights outboard of gunwale while one end of chain secured to anchor and other end of chain to clump ground ring.

(9) One end of two shot faked down chain then secured to clump ground ring at the stern rollers and the other end secured to the wire rope aft of the

H-bitts at the winch.

(Description of fittings, shackles, links and ground ring appears in Annex B)

(10)ATF underway.

2. Anchor Dropping and Leg Laying Procedures.

a. General Information.

(1) All barge moors and the zero buoy were moored with either three legs or four legs, dependent upon purpose of moor, distance from blast and depth of water. The characteristics, number and bearings of legs were obtained from the plans drawn up by the Bureau of Ships.

(2) The bearing of each leg of a three-legged moor in relationship between the expected mooring site and the prevailing wind (068°T) is:

Leg 1 - 45° to the right

Leg 2 - 45° to the left

Leg 3 - downwind

(3) The bearing of each leg of a four-legged moor in relationship between the expected mooring site and the prevailing wind is:

Leg 1 - 45° to the right

Leg 2 - 45° to the left

Leg 3 - 180° from leg 1

Leg 4 - 180° from leg 2

(4) Computations involving scope were solved in advance by the Bureau of Ships planners. No rule of thumb exists at present to assist deep-sea-moor-leg-laying ships to determine the scope of wire rope to be utilized. Factors affecting scope determination include depth of water, weight and strength of wire rope, use of clump and chain, weight of moor and force of wind, current and seas.

Bureau of Ships representatives at the site recomputed distances and scopes as mooring changes were made.

[redacted]

(Method of computations for scope determination will be contained in a separate Bureau of Ships report concerning the design phase of the operation.) Det 2/17/56 Langer has developed a new method for willow.

b. Shiphandling and Seamanship.

(1) General Information.

(a) Various and different shiphandling and seamanship procedures were required, dependent, in general, upon wind and sea conditions and upon the direction of wind in relationship to the YC barge to be moored.

(b) Anchor tolerance was set in a circle having a radius of 300 feet.

(2) Dropping Leg #1 Anchor.

The laying of leg 1 (45° to the right or south of the prevailing wind, 068°T) was accomplished as follows:

(a) The ATF steamed into the wind to the predetermined anchor dropping site. The anchor had to be dropped in a 300 foot radius circle. The ATF began to lower the anchor and clump once inside the circle.

Experiments indicated that the best method of maintaining position during the lowering process was by means of two sextants, cutting in on navigational aids (50-foot towers) placed ashore. Attempts at positioning by using ships pelorus proved unsuccessful because the sub-divisions between degree readings were not accurate and multiplied an error at 10,000 feet beyond the required 300 foot tolerance. Also, a swinging bow would prevent the port and starboard peloruses from obtaining simultaneous readings. This meant an unacceptable delay and difficult to translate when one pelorus was used to cut on two or more navigational aids at a distance of 10,000 feet.

(b) The anchor and clump were lowered by power control on the winch until approximately 300 feet from the bottom. (Wire rope had 50-foot interval markings). At this point and with the tug in her circle, the brake was released and the anchor was dropped freely for the remaining 300 feet.

[redacted]

[redacted]

c. The procedure described in (b) above was selected from a total of four possible methods to drop the anchor.

(1) As described in (b) above.

(2) Lowering the anchor by power before ATF reaches anchor dropping circle.

(3) Free drop of anchor.

(4) Lowering the anchor by brake control after ATF reaches dropping circle.

d. Advantages and disadvantages of the various anchoring procedures are:

(1) ATF commences power lowering <u>efter</u> circle is reached.

(a) Advantages:

1. The winch brake is not released until the ATF is within the specified radius. This permits the ATF to maneuver while the anchor is being lowered, thus insuring a favorable position drop.

2. It helps to prevent the anchor and clump from spinning. This spin would be transmitted to the wire rope if one of the swivels froze or turned more slowly than the anchor. The wire spin would be transferred throughout the full length of the wire and would cause serious kinking or breaking in the vicinity of the drum.

(b) The disadvantage of this controlled drop is:

1. The lowering process with the winch under power in a 4,000 foot depth consumes a good deal of time. Average pay-out speed of the five ATFs was about 2,000 feet per hour. Thus an ATF had to remain on station in the face of 25 knot winds for a period of two to three hours. This posed a difficult shiphandling problem.

(2) ATF commences lowering of anchor before the dropping circle is reached.

(a) Advantage:

1. This method would reduce considerably the time spent by an

[redacted]

[redacted] [redacted]

ATF in the anchor dropping area. As an example, the time spent at a 4,000 foot depth would be reduced from 2 - 3 hours to a matter of minutes.

(b) Disadvantages:

1. A spinning motion would undoubtedly be imparted to the anchor and clump while they were being towed in a lowered position. Any malfunctioning swivel would cause the wire rope to spin resulting in severe kinking throughout its length and possible snapping of the wire at the contact point on the drum with resultant failure.

2. The probability also exists that a tug approaching its dropping circle with 4,000 feet (or more) of wire rope payed out would foul one of the legs of other moors previously positioned.

(3) Free dropping of the anchor.

(a) Advantages:

1. This procedure would eliminate maneuvering and exact station keeping while in the circle.

2. Anchor and clump spin would be eliminated.

3. The danger of fouling legs of other moors would be eliminated.

(b) Disadvantage:

1. The braking power of the winch would be negated by the tremendous speed and weight of anchor, clump and wire rope pay-out. There is no known method of preventing the unreeling of the entire drum under a free drop. Any attempt to secure the wire to the drum would result in snapping the wire or pulling the drum loose from its foundation.

2. The abrupt halt of the anchor against the bottom would result in a fouling of the wire rope with anchor, clump, chain and rope in one heap at the bottom. Whipping would set up undue strains and stresses causing the wire rope to kink or break.

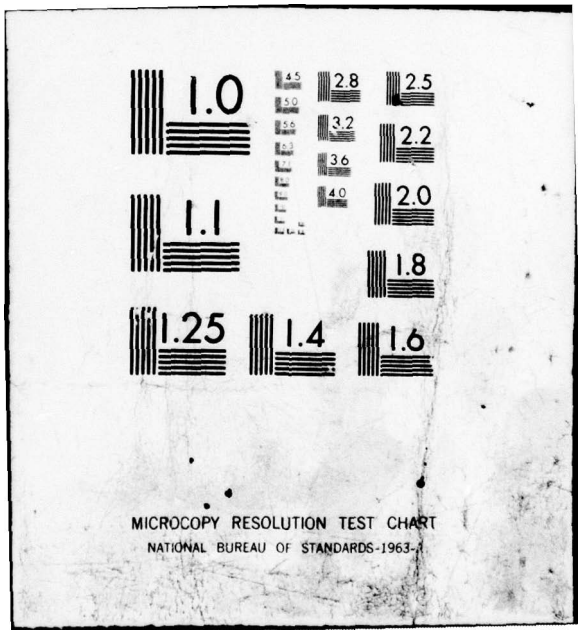
(4) Lowering the anchor by brake control after ATF reaches dropping circle:

[redacted] [redacted]

AD-A078 572 TASK GROUP 7.3 FPO SAN FRANCISCO 96333 F/G 18/3
OPERATION HARDTACK, ENIWETOK PROVING GROUND, MARCH-AUGUST 1958.(U)
1958

UNCLASSIFIED AEC-WT-1155 NL

2 OF 3
AD
AD78572


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

C[redacted]L [redacted]

(a) Advantage:

1. Somewhat faster anchor lowering than by power control thereby reducing the time the ATF is to remain in high maneuvering condition.

(b) Disadvantage:

1. Winch brake is in operation during entire lowering process acting against a gravity pull of more than 12,000 pounds. Brake gear would require constant inspection and renewal.

2. Dangerous condition both for personnel and material loss would result if brake burned out or failed.

e. Afterweighing the advantages and disadvantages of the three different anchor dropping procedures, the first method described, i.e., lowering the anchor after arrival on station, was adopted and standardized.

f. The position of the ATF was carefully checked when the anchor reached the 300 foot mark. With the tug inside the anchoring circle, the winch brake was released and the anchor was free-dropped the remaining 300 feet.

3. Laying Leg #1 Wire Rope.

a. After the anchor was free-dropped the final 300 feet from the bottom, a new problem arose on the ATF (laying leg #1, upwind from moor).

(1) The ATF could not steam downwind (20-30 knot wind) on her approach to the mooring site, paying out wire rope at the rate of 2,000 feet per hour without dragging the anchor and clump, nor could the ATF pay out 6,000 to 12,000 feet of wire rope, after dropping the anchor, and before commencing her approach to the barge. This action would have caused the wire rope to foul the anchor and probably to sever itself through abrasion where coils or lengths crossed.

(2) This problem of downwind approach was solved by the assistance of an ARS vessel.

(3) As the ATF commenced lowering away, an ARS remained upwind, in the vicinity of the ATF, outside the anchoring circle. The ATF had to use rudder and engines to maintain position during the lowering process. At the moment of free anchor drop, the ATF secured her engines and turned to port towards the [redacted]

[redacted] [redacted]

moor. The ARS passed an eight inch manila hawser to the ATF (through the bull nose). The ARS took station about 800 feet crosswind and perpendicular to the line of bearing between the ATF and the moor.

(4) With the tow line in place, and with the wind on her starboard beam, the ATF was permitted to drift downwind, paying out wire rope, along the desired line of bearing to the moor. The ATF maintained a continuous fix along this line of bearing. If drifting was faster than winch speed, or if she was set away from her bearing line, the ARS was signalled to make necessary adjustments in speed and direction.

(5) As the mooring barge was approached, and the predetermined scope of wire payed out, the ATF stopped off the wire rope on the winch.

(6) During the time the ATF is laying leg #1, a YTB is holding the YC barge in the expected mooring position.

(7) An eight inch manila hawser is passed from the bow of the ATF and secured aboard the barge.

(8) Wind and sea conditions at this time will determine whether the YTB is capable of holding the barge and the ATF in position. If the YTB is capable, then the ATF casts off the eight inch manila hawser of the ARS. If the YTB is not capable, then the ARS assists the YTB in keeping the ATF and the barge in position.

(9) The ATF, having stopped off the wire rope with carpenter stoppers, fakes out on the fantail all of the wire rope remaining on the drum. The bitter end is led out through the stern rollers; led forward outboard of the gunwales (either port or starboard) and passed to the YC barge.

(10)The YC barge leads the wire rope through a Berger Fairlead sheave, through snatch blocks as required, to her LSM gasoline driven stern anchor winch. The wire rope, previously faked down on the ATF is hauled in and spooled on the drum of the winch on the barge.

(11)To prevent damage to wire rope and carpenter stopper, and possible

[redacted] [redacted]

injury to the deck crew, before tripping the wire aboard the ATF, the last 100 feet of wire rope aboard is cast overboard, leading both remaining parts through the stern roller chock, the loop being held fast to deck by the carpenter stopper. The stopper is then released, upon signal from the barge crew, and the leg is passed to the barge.

(12)The ATF casts off all tow lines and maneuvers away from the YC barge (still held in tow by the YTB).

4. Handling leg #1 aboard the YC barge.

a. Carpenter stoppers are fixed into place to hold the wire rope. The wire rope which had been hauled in on the drum is payed out and coiled down on the barge to free the drum and make the winch available for the transfer of other legs to the moor.

b. Excessive wire rope may be cut off and removed from the coil to facilitate later adjusting of the barge's mooring position. A slack length equal to approximately 10% of the scope of wire rope, outboard of the carpenter stoppers, should be retained on deck for future positioning. After unused wire rope has been cut and coiled, the barge is free to receive the other mooring legs.

5. Laying legs #2, #3 and #4.

a. The time element in laying legs #2, #3 and #4 (when required) is important. The ATF laying leg #2 should be approaching the moored barge, prepared to send the wire rope aboard as soon as the winch is free of leg #1 on the barge.

b. If the approach is too early (i.e., while the barge is handling leg #1), the ATF has to lay off as required. The task is difficult, even with the assistance of an ARS to maneuver to keep on station with the brake set on the winch. Any headway may drag the anchor; any set may foul another moor's leg. The ATF winch would have been secured because the desired scope had been payed out. Paying out additional wire rope would change the catenary of the rope and possibly cause a crossing interference with another leg. (Due to lengthy

scopes of wire rope and small horizontal distances between barges, legs of various moors crossed each other at vertical depth distances that were critical for clearance).

c. Conversely, the YTB experienced difficulty in keeping a "one-legged" barge in proper mooring position, while waiting for a second leg, in the face of six foot seas and 20 - 30 knot winds.

d. The procedure for laying leg #2 was much the same as for the ATF laying leg #1, i.e., a partial downwind approach made the assistance of an ARS, a necessity.

e. Leg #3 of a three legged moor was the least difficult to lay. The ATF after dropping her anchor and clump steamed directly into the wind as she approached the barge. Therefore, she could maneuver as required and not exceed the winch pay out speed. An assisting ARS was occassionally needed under strong wind and sea conditions.

SECTION III

Chronological description of the operation involved in establishing and maintaining position of each barge, buoy and target vessel that made up the entire target array for the WAHOO test.

This Section contains specific information and details on operating vessels by name; barges, buoys, target vessels by number, scope of each leg; problems arising both peculiar to one moor or common to all of them.

WAHOO ZERO BUOY (THREE LEGS)

19 March 1958

From equipment contained aboard the EC-2, the ATFs were outfitted as follows:

USS TAKELMA (ATF-113) (leg #3)

Three-fourths inch wire ropes of 3,900 feet, 1,500 ft and 900 ft were spliced and rigged on the center drum, inboard to outboard, for a total of 6,300 feet of wire rope. A 3,000 pound LWT anchor attached to one shot of 1¼ inch stud link chain was stopped off over the quarter. A 4,700 pound clump connected to the shot of chain was stopped off at the stern roller. Two shots of chain were faked down on the fantail secured to the clump and the wire.

USS ARIKARA (ATF-98) (leg #1)

Three-fourths inch wire rope, total 5,400 feet obtained, remainder of equipment same as above.

USS CHOWANOC (ATF-100) (leg #2)

Three-fourths inch wire rope, 5,400 feet obtained. Remainder of equipment same as above.

20 March 1958

Rigged bridle for lift of WAHOO zero buoy from YC-1417 alongside EC-2.

21 March 1958

Twenty ton boom used aboard EC-2 to launch zero buoy from deck of YC-1417. YTB-188 standing by to control barge.

Zero buoy is a typical 16 foot telephone buoy. (For details refer Yards and Docks Plan No. 620660).

22 March 1958

USS GRASP towed zero buoy to planned site, accompanied by the ATFs rigged with legs #1, #2 and #3.

The USS TAKELMA laid leg #3 in place and passed control to the zero buoy via USS GRASP with eight inch manila line. Scope in water 5,360 feet. Seven hundred additional feet was coiled and placed on the buoy. Leg secured to buoy by two mine sweeping stops at the snatch block.

The USS CHOWANOC set scope of leg #2 at 4,030 feet which was secured to the buoy as indicated above.

The USS ARIKARA set scope of leg #1 at 4,025 feet. 815 feet of slack was coiled on the buoy.

Approximately ten hours expended between the time of dropping the first anchor and securing the last line to the buoy.

24 March 1958

Examination of buoy by USS GRASP personnel revealed that the retrieving pendants for legs #1 and #2 were fouled around the snatch block's toggle pins and sheave pin nut. Each pendant was lengthened ten feet and cleared.

7,000 pound tension measured on #2 leg. Stopped off leg with one mine sweeping clamp backed up with six "U" bolt clips.

Buoy position is 300 feet bearing 248° from site.

Depth of water is 3,150 feet.

Scope of wire rope is:

Leg	Proposed	Set by ATF
1	4050	4025
2	3980	4030
3	5360	5360

25 March 1958 - 13 April 1958

Buoy holding firm. Wire ropes appear to be in good condition.

14 April 1958

USS MOCTOBI fouled #3 leg of zero buoy. Fouling resulted from MOCTOBI's attempt to recover #1 leg from EC-2. Recovery attempt caused by dragging of EC-2 leg #2 anchor by USS TAKELMA. (Incident to be discussed under EC-2 mooring chronology.)

Inspection indicated that zero leg #3 had to be renewed.

15 April 1958

USS TAKELMA while recovering EC-2 leg #1, fouled zero leg #3. Zero leg #3 was cut and dropped overboard.

17 April 1958

USS GRASP relaid leg #3, scope 5,200 feet of wire plus three shots of chain. 500 feet of wire coiled on buoy.

Zero buoy is 250 feet, bearing 263° from site.

18 - 26 April 1958

Zero buoy holding firm.

Wire rope appears to be in good condition.

27 April 1958

Zero buoy moved upwind. Leg #2 carried away.

Leg 2 fouled by renewal YC-2 leg #3 (laid 15 April). (At underwater crossing point zero buoy leg #2 was at 700 feet depth, YC-2 leg #3 at 1,300 foot depth. Theoretical height difference of 600 feet. Chafing probably existed for 13 days.)

[redacted]

28 April 1958

To prevent a similar mishap, zero buoy leg #2 was replaced with a scope of 3,550 feet vice the original 4,250 feet.

Zero buoy positioned by reducing scope of leg #1 from 4,025 to 3,825 feet. Chain carried away at detachable link outboard of swivel link. Pendant cut because of extreme heavy load. Snatch block, flounder plate and chain assembly run down wire rope. Wire rope stopped off at excess coil.

29 April 1958

Leg #1 was lost as the USS GRASP attempted to renew the snatch block and chain assembly.

1 May 1958

USS GRASP renewed leg #1, scope 4,600 feet of wire rope. (Original laying 4,025 feet.)

Zero buoy is 550 feet, bearing 285°T from planned position.

6 May 1958

USS BOLSTER positioned zero buoy position 50 feet bearing 300°.

7 May 1958

To prevent possibility of chafing against YC-4 leg #1, USS BOLSTER retrieved and relaid zero buoy leg #3 while USS CHOWANOC retrieved and relaid YC-4 leg #1.

8 May 1958

USS GRASP loaded "A" frame and other miscellaneous equipment required for handling "weapon".

9 May 1958

USS GRASP practiced lowering weapon at zero buoy (assisted by YTBs 182 and 188).

10 May 1958

USS GRASP prepared LCM firing barge (to be moored to zero buoy).

[redacted]

15 May 1958

USS GRASP made dry runs on zero buoy with small barge containing Armour equipment.

Sea heavy. Progress unsatisfactory due to general unseaworthiness of barge. Barge re-towed to USS MONTICELLO where draft adjusted by removing end compartment ballast. Steel plate shield installed on weather end of barge to prevent sea from entering hatch leading to men working on equipment.

16 May 1958 "W" Day

USS GRASP lowered the weapon with Sandia cable attachments. (Positioning of weapon, barges, floats and measuring devices are classified and therefore not included.)

YC-1 BARGE (Four Legs)

20 March 1958

Two 1500 pound LWT anchors prepared for helicopter lift to "deadman" placement position for legs #1 and #2 on IRWIN and JAMES Islands.

24 March 1958

Helicopter dropped anchor near group of palm trees at eastern end of IRWIN Island for "deadman" of YC-1 leg #1.

Helicopter dropped anchor and 3/4" stud link chain on JAMES Island for "deadman" of YC-1 leg #2.

25 March 1958

Leg #4 for YC-1 barge loaded aboard USS CHOWANOC from EC-2. (6,000 ft one inch wire rope, chain, clump, anchor.)

26 March 1958

Helicopter carried working party to IRWIN Island. Planted anchor (previously dropped) in 5 foot deep sand pit, flukes spread 30°, pointed downward and secured 4" by 4" plank between flukes and shank. Anchor attached to three shots of 3/4" stud link chain with bights around two palm trees. Nine shots of 1¼" stud link chain shackled to 3/4" chain and led to shore line. Leg #1 of

YC-1 barge will be attached.

Anchor and chain for leg #2 placed on JAMES Island.

27 March 1958

YC-1 barge (hull #1413) towed to position by USS GRASP.

JAMES Island "deadman" made up with two shots 3/4" link to anchor, one shot 1½" to breaker line and eight shots 1½" seaward. (Total eleven shots). An LCM carried the one inch wire rope of leg #2 from the USS MOCTOBI to JAMES Island. Wire rope secured to 1½" shot. Due to poor ground holding ability, anchor dragged by YC-1 and USS MOCTOBI and finally dug in about 300 feet from middle of island. Fifty foot in land.

IRWIN Island "deadman" was dragged approximately 200 feet (both palm trees sheard off when one inch wire rope of leg #1 was attached and taken in tow by the USS TAKELMA).

USS ARIKARA laid leg #3 and passed to YC-1 barge.

USS CHOWANOC laid leg #4 and passed to YC-1 barge.

28 March 1958

Scopes for YC-1 barge established as follows:

Leg #1 - 5,000 feet wire, 1,080 feet chain, 220 feet ashore. Total required for leg #1 is 3,700 feet. Approximately 2,300 feet of wire to be hauled in.

Leg #2 - 5,400 feet wire, 990 feet chain, 310 feet ashore. Total required for leg #2 is 4,100 feet. Approximately 1,900 feet of wire to be hauled in.

Leg #3 - 4,610 feet wire. Approximately 1,400 feet of wire to be hauled in.

Leg #4 - 4,200 feet wire. Approximately 1,800 feet of wire to be hauled in.

The torque connector relief valve stuck on the YC-1 barge winch spilling oil out through fill pipe. Winch producing 18 psi instead of 40 psi. Repairs

[redacted]

required.

31 March 1958

By-pass tubing installed on winch. Legs #1 and #3 hauled in 100 feet to positioning.

USS MOCTOBI placed 1500 lb LWT anchors in lagoon to back up "deadman" anchor 1 on IRWIN Island. 3½ shots of 3/4" chain used to connect both anchors.

Leg #4 stopped off at 4,200 feet scope, 1,800 feet of wire faked out on deck of barge.

Leg #1 - 3,700 feet of wire, 2,300 feet on deck.

Leg #2 - 5,000 feet of wire, 1,000 feet on wire found in poor condition because of contact with coral reef.

Leg #3 - 5,300 feet of wire, 700 feet on deck.

Winch stalled.

Leg #2 payed out additional 600 feet. Wire leads under barge and across coral head. USS GRASP ran loose shackle and freed wire.

1 April 1958

YC-1 barge passed leg #2 to USS MOCTOBI for re-running. USS MOCTOBI hauled in 7,000 feet on drum and cut wire with propeller 200 feet from end. Soft eye put in at 7,000 foot mark. Control of leg #2 passed from barge to USS MOCTOBI.

USS GRASP assisting in re-run of leg.

USS MOCTOBI re-ran leg, rigged balloons (nylon 2 ft cube, lifting capacity about 300 pounds), on wire. 900 feet of wire discarded because of kinks. 3,600 foot scope passed to YC-1 barge with 1400 feet on deck. In the transfer process, 600 of the 1,400 foot was found to be unusable. Scope should be 4,100 feet indicating 500 feet must be payed out by the YC-1 barge.

2 April 1958

The scope of leg #2 was lengthened to 4,300 feet (about 100 feet remains on drum). Tension of leg #3 reaching 17,000 pounds. Leg #3 passed to USS ARIKARA for re-run.

[redacted]

[redacted]

Leg #4 shortened, scope now 3,000 feet wire, 3,000 feet on deck.

YC-1 barge 400 feet out of position, bearing 110°.

Leg #3 was re-run and passed to barge. 1,000 feet cut off free end because of kinking 4,900 foot scope, 100 feet on deck. Required scope is 4,610 feet. 250 feet of leg #3 hauled in, scope now 4,650 feet.

Leg #4 passed to USS ARIKARA for resetting. Anchor about 2,000 feet closer to barge than originally planned. Believed due to USS CHOWANOC bouncing anchor on bottom while anchor at short stay during first drop. Anchor probably dragged during this process.

Leg #2 re-examined, 600 feet of kinked wire cut off. Scope adjusted to 4,300 feet of wire, 200 feet on deck.

Leg #4 reset by USS ARIKARA and returned to barge. Scope set at 4,500 feet, 1,500 feet on barge.

Leg #3 adjusted to scope 4,310 feet of wire 690 feet on deck.

Barge position is 220 feet bearing 173° from required position.

3 - 28 April 1958

YC-1 barge remaining in position.

29 April 1958

Inspection indicated:

Leg #1 was slack.

Legs #2, #3, and #4 had heavy tension.

Leg #2 kinked inboard of fairlead and dangerous to attempt letting out.

Leg #3 scope increased 100 feet.

Leg #4 chafing at sheave. Hauled in leg #4, 20 feet past chafing point (two broken strands).

2 May 1958

Spliced 1,000 feet wire to leg #2 and increased scope.

Leg #4 had three broken strands, heavy tension but too short to pay out.

3 May 1958

[redacted]

[redacted]

Leg #2 let out 300 feet, reducing tension.

Leg #1 hauled in three feet.

7 May 1958

Chafing chains (one shot of 1½" stud link) placed all four legs to forestall flexure damage occurring on Berger Fairlead sheaves.

8 May 1958

Positioned YC-1 barge by letting out 100 feet on leg #1 and taking in 75 feet on leg #3.

14 May 1958

Working party transferred to barge to prepare for the EC-2 moor.

USS CREE towed EC-2 about midway between YC-1 and YC-2.

(Mooring of EC-2 between YC-1 and YC-2 is separate topic.)

YC-2 (FOUR LEGS)

3 April 1958

USS GRASP towing YC-2 to pre-determined site.

USS TAKELMA - leg #1.

USS MOCTOBI - leg #2.

USS CHOWANOC - leg #3.

USS ARIKARA - leg #4.

USS TAKELMA dragged anchor 2,200 feet on first drop of leg #1. Second drop made 300 feet from desired position. (USS GRASP assisting.)

USS CHOWANOC laid leg #3 (USS BOLSTER assisting), and passed to YC-2.

USS ARIKARA lost anchor, chain and clump on leg #4 because of bending shackle spread at wire rope connection to swivel.

USS MOCTOBI (laying leg #4 instead of #2) lost anchor, chain and clump because of bending shackle spread over stern roller.

USS TAKELMA passed leg #1 to YC-2 barge. YC-2 barge stopped scope of leg #3 at 6,600 feet with 400 feet on deck. Leg #1 stopped at 6,200 feet with 800 feet on deck.

[redacted]

Winch developed hot bearing and intermediate shaft bronze bushing seized.

4 April 1958

Cooled bearing with grease and water mixture.

Leg #1 reduced in scope to 5,000 feet, 1,000 feet on deck; 1,000 feet cut off original length.

USS ARIKARA laid leg #4 and passed to YC-2 barge.

Leg #4 scope set at 5430 feet wire rope, 1,000 feet on deck; 550 feet cut off original length.

USS MOCTOBI laid leg #2 and passed to YC-2 barge.

Leg #2 scope set at 5,000 feet, 1,500 feet on deck.

Leg #3 scope set at 5,800 feet, 1,200 feet on deck.

11 April 1958

YC-2 barge positioned as follows:

Leg #1 - scope 4,200 feet, 1,650 feet on deck.

Leg #2 - scope 5,450 feet, 550 feet on deck.

Leg #3 - scope 5,430 feet, 1,570 feet on deck.

Leg #4 - scope 5,200 feet, 800 feet on deck.

14 April 1958

Leg #1 hooked by dragging anchor of EC-2 moor.

Leg #3 wire rope broke at Fairlead sheave. (Incident to be discussed under EC-2 mooring chronology.)

15 April 1958

Leg #3 renewed by USS GRASP.

Scope 550 feet, 1,450 feet on deck.

Leg #1 fouled during recovery attempt by USS TAKELMA. Leg #1 cut and cast overboard. USS MOCTOBI re-laid leg #1.

Leg #4 out of position needing renewal.

Scope on leg #1 5,000 feet, 2,000 feet on deck.

[redacted]

16 April 1958

USS TAKELMA recovered leg #4 of YC-2 barge.

18 April 1958

USS TAKELMA re-laid leg #4.

Scope of leg #4 from YC-2 barge 5,430 feet, 220 feet on deck.

19 April 1958

Positioned YC-2 as follows:

Leg #1 - 5,000 foot scope, 2,000 feet on deck.

Leg #2 - 5,450 foot scope, 550 feet on deck.

Leg #3 - 5,550 foot scope, 650 feet on deck.

Leg #4 - 5,430 foot scope, 220 feet on deck.

29 April 1958

Two broken strands discovered on YC-2 leg #2, (vicinity of Berger Fairlead sheave).

Leg #1 scope increased to 5,200 feet.

Leg #2 scope reduced to 5,400 feet (chafed wire aboard).

Leg #3 unchanged.

Leg #4 scope increased to 5,500 feet (additional wire must be spliced in).

2 May 1958

1,000 feet of wire spliced to YC-2 leg #4.

3 May 1958

Winch battery davit.

4 May 1958

Bearing points changed on all Berger Fairlead sheaves to reduce fatigue.

Leg #4 scope increased 300 feet to 5,800 feet.

Legs #1, #2 and #3 scopes reduced about 5 feet each. YC-2 barge in position.

7 May 1958

Chafing chains (one shot 1¼" stud chain link) placed on all four legs.

[redacted]

EC-2

The original plan called for the EC-2 hull (ex-SS MICHAEL MORAN) to be positioned and held in place 300 feet from the YC-2 barge and 1,200 feet from the YC-1 barge. Her mooring lines were to lead directly to the YC-1 and YC-2. This arrangement would moor the EC-2 broadside, 2,300 feet from the zero buoy.

Due to the prevailing winds (25 - 30 knots), it was decided to increase the strength of the moor by adding bow and stern mooring buoy. Buoys used were the standard BUDOCKS 9 ft, 6 inch diameter, 5 foot deep mooring buoys. Two legs provided for each buoy.

14 April 1958

USS GRASP towed bow buoy into planned position, approximately 600 feet dead ahead of the expected moor position of the EC-2.

USS TAKELMA while lowering anchor for leg #2 in 800 feet of water, had to stop winch at the 900 foot socket connection to pass them through the spooling device. Anchor dragged across underwater reef and slope. While recovering anchor and wire rope, YC-2 barge leg #1 was hooked and dragged. Dragging of leg #1 caused undue strain on YC-2 barge, causing leg #3 to break at the Berger Fairlead sheave. Examination of recovered anchor revealed one broken fluke.

The spooling device was removed from the USS TAKELMA. All ATFs were notified to remove spooling devices if spliced wire was on drums.

Clump and chain was lost on USS TAKELMA due to the bending shackle spreading aft of the stern roller.

USS MOCTOBI laid leg #1 of bow buoy but had to stand off buoy while USS TAKELMA was recovering leg #2. While standing by, the USS MOCTOBI fouled zero buoy leg #3. To clear leg #3, the chain was cut between the clump on bow buoy leg #1 and the wire rope. Thus, anchor, one shot of chain, and clump were lost.

15 April 1958

USS TAKELMA while recovering YC-2 leg #1, brought up the EC-2 bow buoy leg #1 (previously laid by USS MOCTOBI). YC-2 leg #1 and EC-2 bow buoy leg #1 were

both cut because of excessive wear and kinking.

4 May 1958

USS GRASP towed EC-2 bow buoy to intended position. YTB held bow buoy in place while USS GRASP laid leg #2. Anchor for leg #2 dropped bearing 060°T from buoy. Leg #2 secured to buoy (3,200 feet wire rope, three shots of chain, total scope 3,470 feet, depth of water 720 feet.)

USS BOLSTER laid leg #1. Anchor dropped bearing 072°T from buoy. Scope when secured to buoy was 4,100 feet wire rope, three shots chain, total scope 4,370 feet.

EC-2 bow buoy now in position.

7 May 1958

EC-2 stern buoy towed into position by USS GRASP. Buoy 600 feet from stern of expected EC-2 moor. Control of buoy given to YTB. USS GRASP dropped stern buoy leg #1 anchor bearing 000° from stern buoy, horizontal distance 3,400 feet. Leg #1 secured to stern buoy, scope 3,200 feet of wire rope, three shots of chain, total scope 3,470 feet, depth of water 960 feet.

USS BOLSTER dropped stern buoy leg #2 anchor bearing 330°T from stern buoy. Leg #2 secured on stern buoy, scope 4,700 feet of wire rope, three shots of chain, total scope 4,970 feet.

EC-2 stern buoy now in position.

To prevent bow and stern buoys from drifting, 1 1/8" wire was run from each buoy to the YC-2 barge.

14 May 1958

USS CREE towed EC-2 hull into mooring position.

YTB 188 took wire from YC-2 barge (wire previously installed between buoy and barge) and passed it through the stern chock of the EC-2.

EC-2 secured wire to quarter bitt. Scope about 720 feet.

YTB 182 took wire from YC-2 barge and passed it through the bull nose of the EC-2. EC-2 secured wire to forward bitts.

[redacted]

Chafing chains not used to moor EC-2 hull to bow and stern buoys.

YTB 188 received 1,440 feet of 1 1/8" wire via forward port chock EC-2 hull. Mooring wire was secured on deck of EC-2 with one shot of 1½" stud link chafing chain made fast by figure 8 around bitts shackling into on port. Mooring wire was led through Berger Fairlead sheave on YC-1 and secured by carpenter stopper. YTB 188 received 1,440 feet of 1 1/8" wire from port quarter chock EC-2 hull. Mooring wire secured on deck of EC-2 hull with 1½" stud link chain made fast to bitts. Mooring wire was led through Berger Fairlead sheave on YC-1 and secured by carpenter stoppers.

YTB 182 ran a secondary wire from the bow buoy to the EC-2 hull forward port chock. 720 feet of wire was stopped off with chafing chain made fast to bitts.

EC-2 hull passed 1 1/8" wire through forward starboard chock to YTB 188. Wire run to YC-2 deck through Berger Fairlead sheave and secured by carpenter stoppers.

Only one mooring line was run from the EC-2 hull to the YC-2 barge instead of the originally planned two. One was sufficient to prevent yawing by the EC-2. The second line would have proved to be a hindrance to other working tugs and boats.

YC-3

Eliminated firing planning stages.

YC-4 (THREE LEGS) (CHANGED TO FOUR LEGS AT LATER DATE)

7 April 1958

YC-4 barge towed to position by USS GRASP.

USS CHOWANOC laid leg #1 and passed to YC-4 barge. Scope 7,500 feet, 500 feet of wire rope on deck.

USS ARIKARA laid leg #2 and passed to YC-4 barge. Scope 6,750 feet, 1,200 feet of wire rope on deck.

USS TAKELMA laid leg #3 and passed to YC-4 barge. Scope 8,000 feet, 500

[redacted]

[redacted]

feet of wire rope on deck.

YC-4 barge in position. Depth of water is 3,700 feet.

15 April 1958

YC-4 barge leg #1 fouled by USS TAKELMA. (Incident described under YC-2 mooring data for same date.)

Leg #1 cut and cast overboard.

18 April 1958

USS MOCTOBI renewed YC-4 barge leg #1. Scope of wire rope 6,900 feet, 600 feet on deck.

5 May 1958

YC-4 barge positioned as follows:

Leg #1 - scope reduced from 6,900 feet to 6,700 feet.

Leg #2 - scope reduced from 6,750 feet to 6,450 feet.

Leg #3 - scope increased from 8,000 feet to 8,200 feet.

7 May 1958

USS CHOWANOC picked up leg #1 to prevent interference while USS BOLSTER was replacing zero buoy leg #3. Leg #1 was replaced.

YC-4 positioned as follows:

Leg #1 - scope 6,200 feet.

Leg #2 - scope 6,450 feet.

Leg #3 - scope 8,050 feet.

8 May 1958

To improve strength and safety of YC-4 barge, leg #4 was laid by the USS ARIKARA bearing 098°T from the YC-4 barge. Scope 6,820 feet.

9 May 1958

YC-4 barge positioned by increasing scope of leg #1. Scopes now read:

Leg #1 - 6,500 feet.

Leg #2 - 6,450 feet.

Leg #3 - 8,050 feet.

[redacted]

[redacted]

Leg #4 - 6,820 feet.

12 May 1958

All excess wire removed from YC-4 barge.

Laboratory equipment installed on barge after transfer from USS GRASP.

15 May 1958

Mooring of DD-474 between YC-4 barge and YC-5 barge will be discussed under DD-474 mooring.

YC-5 BARGE (THREE LEGS)

10 April 1958

USS GRASP towed YC-5 barge to position.

USS CHOWANOC laid leg #1 and passed to YC-5 barge.

USS TAKELMA laid leg #2 and passed to YC-5 barge.

USS MOCTOBI laid leg #3 and passed to YC-5 barge.

YC-5 barge aligned with YC-4 and zero buoy, 4,700 feet. The desired position should be 4,500 feet from zero buoy. Depth 4,000 feet.

Scope is as follows:

Leg #1 - 7,000 feet.

Leg #2 - 8,200 feet.

Leg #3 - 8,600 feet. (Anchor for leg #3 probably dropped 300 feet long of plotted position.)

24 April 1958

Leg #3 found broken on deck at Berger Fairlead sheave. (Remedy to prevent future failures later discussed).

25 April 1958

USS GRASP renewed leg #3 of YC-5 barge.

Scope of positioned barge is:

Leg #1 - 7,000 feet.

Leg #2 - 8,200 feet.

Leg #3 - 8,900 feet.

[redacted]

[redacted]

6 May 1958

Chafing chains (one shot 1¼" stud chain link installed on all three legs to prevent wire fatigue, see 24 April entry).

8 May 1958

Scope (wire rope only) adjusted to:

Leg #1 - 6,800 feet.

Leg #2 - 8,200 feet.

Leg #3 - 8,600 feet.

15 May 1958

Mooring of DD-474 discussed under DD-474 mooring.

DD-474

To be moored between YC-4 barge and YC-5 barge. Heading directly away from zero buoy, distance 3,000 feet.

15 May 1958

USS ARIKARA towed DD-474 into position. One end of 720 foot 1 1/8" wire passed from stern of DD-474 to YTB to be carried to YC-4 barge. Secured on YC-4 by carpenter stoppers, 10 feet slack on YC-4 deck.

One end of 1,440 foot 1 1/8" wire secured to one shot 1¼" chafing chain led through hull nose to YTB 188 to be carried to YC-5 barge. Wire passed through Berger Fairlead sheave to YC-5, secured on YC-5 by carpenter stoppers 200 feet slack on deck of YC-5.

Mooring position adjusted to measure 500 feet from YC-4 barge and 1500 feet from YC-5.

YC-6 (THREE LEGS)

25 April 1958

YTB 188 towed YC-6 barge to mooring site.

USS CHOWANOC laid leg #1.

USS TAKELMA laid leg #2.

USS ARIKARA laid leg #3.

[redacted]

A slack moor was prepared with scope set as follows:

Leg #1 - 9,500 feet.

Leg #2 - 9,000 feet.

Leg #3 - 9,500 feet.

Depth of water 4,400 feet.

3 May 1958

YC-6 observed far out of position, downwind, leg #1 very slack. While hauling in on leg #1, it was discovered wire parted at the 2,000 foot mark. Examination revealed wire severely abraided and mashed at one foot intervals over a 100 foot section. Cause of failure not known inasmuch as wire rope break was midway in a depth of 4,000 feet of water. No pinnacles known to exist in this area. No acceptable theories as to wire failure was advanced.

USS CHOWANOC (using anchor leg previously prepared for YC-8) renewed leg #1. USS GRASP assisted in the maneuvers. YTB-182 towed the YC-6 barge upwind to original site.

All three legs adjusted on YC-6 barge. Legs have new bearing points. Range to YC-5 barge measures by Mark 14 Range Finder at 670 yards. YC-6 barge is exactly as required.

5 May 1958

Scope decreased as follows:

Leg #1 - reduced 350 feet.

Leg #2 - changed chafing point on sheave.

Leg #3 - reduced 400 feet.

6 May 1958

One shot of 1¼" stud link chain installed on all three legs to prevent undue wear at Berger Fairlead sheave contact points.

Legs adjusted and barge well positioned.

15 May 1958

Mooring of DD-592 will be discussed under that heading.

DD-592

The original plan was to moor the DD-592 broadside to the blast, held in position by mooring wires led from YC-5 and YC-6. Distance to zero buoy was 3,000 feet.

Due to the prevailing wind (25 - 30 knots), it was decided to increase the strength of the moor by adding bow and stern mooring buoys.

Buoys used were BUDOCKS 9 ft by 6 inch diameter, 5 foot deep, standard mooring buoy. Each buoy to be held in place by one anchor leg.

5 May 1958

USS ARIKARA placed single leg for DD-592 bow buoy and secured wire to bow buoy positioned 600 feet out from estimated bow location of ship. Scope of wire rope was 7,410 feet bearing 023°T from bow buoy.

USS MOCTOBI placed single leg for DD-592 stern buoy and secured wire to buoy positioned 600 feet out from estimated stern location of DD-592. Scope of wire rope was 7,800 feet, bearing 113°T from stern buoy.

15 May 1958

USS BOLSTER towed DD-592 to mooring site.

YTB 188 assisted in securing 1 1/8" target tow wire through stern chock of DD-592 to stern buoy.

YTB 188 assisted in securing 1 1/8" target tow wire through hull nose of DD-592 to bow buoy.

Wires stopped off aboard ship by carpenter stoppers.

YTB 188 passed starboard bow and starboard stern quarter wire from DD-592 to YC-5. One shot of 1½" link chain led from deck of DD-592. 500 foot of slack wire left on deck of YC-5 because YC-5 was thought to be 300 feet further than required from zero buoy.

YTB 188 passed port bow and port quarter wire from DD-592 to YC-6. One shot of 1½" stud link chain led from deck of DD-592. No slack wire left on YC-6.

Port stern wire not used to YC-6. All four mooring wires referred to were led to the YC barges via Berger Fairlead sheaves and stopped off by carpenter stoppers.

DD-592 moored broadside to explosive site, 500 feet from YC-5 and 1,500 feet from YC-6.

YC-7 (THREE LEGS)

27 April 1958

USS GRASP towed YC-7 barge to site.

Moored YC-7 in slack moor with legs laid by the following tugs:

Leg #1 - USS MOCTOBI. Scope 8,280 feet, 420 feet on deck.

Leg #2 - USS ARIKARA. Scope 8,380 feet, 1,120 feet on deck.

Leg #3 - USS CHOWANOC. Scope 8,910 feet, 1,090 feet on deck.

Depth at moor 4,600 feet.

6 May 1958

YC-7 barge remained in position.

One shot of 1½" stud link chain installed as chafing chain on each leg.

8 May 1958

Scope of leg #2 was reduced from 8,380 feet to 7,980 feet.

9 May 1958

YTB 182 assisted in setting mooring wire between YC-6 and YC-7 barges.

Mooring consisted of one shot of 1½" stud link chain secured to each barge and 1,440 feet of 1 1/8" target wire. Overall total of 1,620 feet.

12 May 1958

YC-7 barge discovered out of position despite mooring wire secured to YC-6 barge. Investigation revealed leg #1 very slack. Leg #1 wire parted at a point 2,000 feet from barge. Fifty feet of wire chafed and appeared to have been

severed by contact with coral.

This was a duplicate of the failure found on 3 May on the YC-6 barge leg #1.

Both legs (YC-6 and YC-7 had their #1 legs lost by an unexplained failure at a depth of approximately 2,000 feet in over 4,000 feet of water.

It is interesting to note that legs were about 1,500 feet apart, more or less parallel to each other.

13 May 1958

USS CHOWANOC renewed leg #1 of YC-7 barge. Anchor dropped slightly beyond desired point. Scope 8,000 feet, 950 feet on deck of YC-7.

15 May 1958

Mooring of DD-593 between YC-7 and YC-9 discussed under DD-593 moor.

YC-8

Design plans called for a four legged moor.

Inasmuch as the YC-8 was to be moored 200 feet from the YC-9 barge, it was thought that wire fouling would result because of the close proximity of the two barges.

The plans were then changed to provide a two legged moor for YC-8 with two mooring wires to YC-9.

However, it was decided to eliminate the SSK-3 from her planned periscope depth moor between YC-8 and YC-9 because of strong winds and seas.

With this decision made there would be no value for experiment purposes to moor the YC-8.

Rough seas forced the abandonment of a continuous attempt by the USS GRASP to land instruments and other measuring devices aboard the YC-9. One piece of equipment weighed approximately 3,000 pounds.

As a result, the YC-8 barge was "drydocked" in the USS MONTICELLO and all equipment was loaded at this time.

On 12 May the USS GRASP towed the YC-8 to the downwind side of the YC-9.

[redacted]

(The YC-9 barge had been positioned in the target array YC-8 mooring site.)

The YTB 188 assisted in placing two mooring wires from the bow of the YC-8 to the side of the YC-9.

Mooring consisted of two 1 1/8" target tow wire pendants secured to bitts on the YC-9. Both wire pendants were led to separate shots of 1½" stud link chain stopped off by carpenter stoppers on the YC-8. Each wire pendant was 232 feet long.

YC-9 (FOUR LEGS)

29 April 1958

USS GRASP towed YC-9 barge to mooring site.

USS TAKELMA laid leg #1 - scope 8,700 feet.

USS MOCTOBI laid leg #2 - scope 9,100 feet.

USS CHOWANOC laid leg #3 - scope 9,200 feet.

USS ARIKARA laid leg #4 - scope 9,700 feet. Deepest depth 5,400 feet. Depth of water 4,900 feet.

Heavy swells in this area (approximately 20,000 feet from beach) made positioning extremely difficult. USS GRASP made several attempts to land instruments aboard YC-9. Inasmuch as YC-8 was moored 200 feet from YC-9, instruments were placed on YC-8 instead.

DD-593

A fore and aft moor between YC-7 and YC-9 with stern towards zero buoy.

15 May 1958

USS TAKELMA towed DD-593 to mooring site.

With assistance from the YTB-188, the DD-593 was moored as follows:

1 1/8" stern wire, through stern chock to YC-7 barge, stopped on YC-7 deck with 700 feet of slack, using carpenter stoppers.

1 1/8" bow wire, through bull nose to YC-9 barge, stopped off on YC-9 deck with 600 feet of slack, using carpenter stoppers.

[redacted]

DD-593 moored 9,000 feet from zero buoy, 1,000 feet from YC-7 and 1,500 feet bow towards YC-9.

SECTION IV

Major Difficulties

The major difficulties encountered were of three general types, (1) weather, (2) failure of operating equipment, and (3) failure of wire rope.

1. Weather.

Winds and seas were much stronger than expected. Twelve to fifteen knot winds were planned for, when it was contemplated for the majority of the work to be done in May and June, however, the shot was advanced and twenty to thirty knot winds were the daily average. Inasmuch as this type of operation called for extreme maneuverability at very slow speeds, strong winds and seas seriously hampered the efforts of the ships and men concerned.

To overcome this handicap, each leg-laying ATF was assisted by an ARS while the ATF was paying out wire rope. The ARS also had to assist while the ATF was passing wire rope to the receiving barges.

The strong winds and seas also affected the working parties on the barges. Transferring of personnel and equipment became hazardous at times. On 1 May, three men were washed overboard during an attempt to transfer personnel and laboratory equipment to a YC barge. All men were recovered uninjured.

The delay caused by weather conditions prevented the David Taylor Model Basin personnel from completing their studies on the measurements of tensions set up in the moors.

2. Failure of Operating Equipment.

a. On two occasions two bending shackles spread (between swivel and chain) while lowering the anchor and clump over the stern rollers, causing the loss of two units (anchor, chain and clump). This condition was remedied and future mishaps prevented by welding all shackle pins in place.

b. Because of the small diameter of the Berger Fairlead sheaves, excessive fatigue was observed in the wire rope in the vicinity of these sheaves. Swells caused the barges to pitch and roll producing an estimated 20,000 flexures daily in the exposed wire rope. One complete leg was lost when a wire rope parted in this section. Many legs had broken wires caused by these conditions.

[redacted]

This condition was remedied by the installation of chafing chains, fifteen feet of 1½" stud link chain. These chains were shackled into a padeye on deck and had the bridle of the carpenter stoppers fastened to the other end and secured to the wire rope outboard of the Berger Fairlead sheaves.

c. The torque converter relief valve stuck on the YC-1 winch throwing oil out through the fill pipe, thereby reducing pressure to 18 psi vice 40 psi. To prevent similar embarrassments on all other barge winches, bypass tubing was installed on every LSM gasoline drum stern anchor winch.

d. Spooling devices had to be removed from the ATF winches while paying out wire rope which had been spliced with sockets previously. The sockets which married both wire ropes did not slide through the spooling device as rapidly as the wire rope. Inasmuch as the devices were not required due to the weight of the anchor and clump, their removal during the pay-out operation caused no inconveniences.

3. Failure of Wire Rope.

a. Eight complete anchor and leg units were lost due to the failure of the wire rope. It was noted that the one inch target tow wire rope had less failure (including broken strands) than the one inch high grade plow steel galvanized wire rope.

(1) Failures were caused by:

(a) Excessive flexures (Berger Fairlead sheaves).

(b) "Sawing" (legs crossing each other).

(c) "Scraping" (across coral).

(d) Unknown (two wire ropes parted at 2,000 foot depth in over 4,000 feet of water).

(e) Fouling during the laying operation.

(2) Broken strands and or kinking.

In addition to the above failures, much wire rope had to be cut and discarded because of broken strands and/or kinking.

(a) Broken strands were generally caused by wire rope handling equipment and by sea movement, (flexures).

(b) Kinks were generally caused by snagging on coral pinnacles,

[redacted]

excessive coiling while shifting mooring positions and in the normal handling situation.

4. Miscellaneous Causes for Anchor Losses.

a. One complete anchor-clump unit lost when wire rope leg was inadvertently cut by an ATF propeller.

b. One anchor-clump unit lost when the fluke of a different anchor broke causing the anchor to be dragged down a slope cutting another wire rope in two during the process.

[redacted]

SECTION V

Actual Target Positions and Physical Effects of Blast on Targets

1. A photographic aerial survey made by the Air Force from 1,500 feet just prior to the blast indicated the following horizontal target distances, (in feet).

Target	Desired Distance From Zero Buoy	Actual Distance From Zero Buoy	Error
Zero Buoy	0	0	0
YC-1	3500	3414	87
EC-2	2300	2346	46
YC-2	2000	1915	85
YC-4	2500	2014	486
DD-474	3000	2915	85
YC-5	4500	4337	163
DD-592	5000	4835	165
YC-6	6500	6250	250
YC-7	8000	7845	155
DD-593	9000	8887	113
YC-9	10384	9883	501
YC-8	10616	10108	508

2. Physical Effects of shot on Targets.

a. YC-1.

No damage. All four legs held.

b. EC-2.

No damage. Mooring lines to YC-1, YC-2, bow buoy and stern buoy held.

c. YC-2.

Legs #1 and #2 held. Legs #3 and #4 carried away. No damage to barge.

d. YC-4.

Capsized. Legs #1, #2, and #3 held. Leg #4 carried away as chain loop over Berger Fairlead dropped off.

e. DD-474.

No damage to ship, mooring line to YC-4 held. Mooring line to YC-5 carried away.

f. YC-5.

Leg #1 carried away. Wire leading to DD-474 carried away.

Due to the carrying away of both of the above wires, the YC-5 barge was picked up by the initial surge wave and thrown against the starboard stern quarter of the DD-592. No damage was done to the barge.

Leg #2 carried away the next day; leg #3 held.

[redacted]

g. DD-592.

Bow buoy line and port bow wire to YC-6 held. All other lines held but evidently weakened. Twenty-four hours after blast all lines parted and DD-592 rode downwind from bow buoy.

DD-592 damaged on starboard side by YC-5. Approximately one-third of transoms plating carried away on deck but not extending to water line, cutting a hole 5 ft by 7 ft.

h. YC-6.

Leg #1 carried away, all other legs and mooring wires held. No damage.

i. YC-7.

All mooring lines held, no damage to barge.

j. DD-593.

All mooring lines held, no damage to ship.

k. YC-9.

Leg #3 carried away, all other legs and mooring lines to YC-8 held. No damage to barge.

l. YC-8.

All mooring lines held, no damage to barge.

3. General.

a. Results of the physical effects of blast indicated that the moors, barges, wire rope, chain, anchor and other fittings were generally strong enough and could be used in another experiment of this type.

b. A point of interest is the conjecture as to why the YC-4 barge capsized. The barge was righted subsequently and found undamaged. The YC-4 barge was the only 500 ton barge used in the test. Having approximately the same length and width of the 250 ton barges, the YC-4 had a larger freeboard. The YC-2 barge was actually a hundred foot closer to the blast than the YC-4 but the YC-4 was in much deeper water. The YC-4 had three legs leading towards the blast, two of them leading in the same general direction. The YC-2 had her four legs at 90° intervals. The possibility exists that the weight of the two close together legs kept one corner of the barge down when the other three corners were lifted by the blast.

c. The feasibility of permitting the Mooring Officer to add strengthening lines as he sees fit was clearly demonstrated in that further damage to the DD-592 was prevented by the addition of a bow mooring buoy. The day after the explosion found the damaged DD-592 riding downwind from this buoy; all other mooring lines having carried away. Undoubtedly, free drifting in the heavy seas would have caused additional damage.

d. The SSK-3 was eliminated from the target area because of the difficulty in placing her in an unmanned periscope depth position between the YC-8 and YC-9 barges. She was relocated at periscope depth in a manned operational condition, 6,000 yards bearing 120°T from zero buoy. No damage was caused by shock.

SECTION VI

Comments, Conclusions and Recommendations

1. General.

a. The general comments, conclusions and recommendations that follow are made entirely from the "seamanship-shiphandling" viewpoint. No attempt will be made to comment on the dynamics, values, strength, holding power, and measuring devices on the test results except those physical effects stated in Section IV.

b. Information concerning much of the above and other related topics will be contained in another report to be prepared by the Bureau of Ships.

2. Specific.

a. Power is not the prime requisite for the operating tugs. It is believed that the ATFs utilized lacked sufficient maneuverability. More could be accomplished by using ATAs. The ATA, although less powerful, is more maneuverable. The ARSs and the YTBs performed satisfactorily.

b. It is recommended that tugs assigned to this type experiment in the future have their tow winches modified by increasing the depths of the flanges of the drums to permit the handling of the necessary amount of wire rope. The ATFs used in the WAHOO event had to modify the drums by welding a three inch flange extension around each wall to provide space for a scope of 12,000 feet of one inch wire rope.

Because of this space limitation, the wire rope to be utilized was set at one inch and all scope computations were based on this fact.

c. Under normal operating conditions, a minimum of five hours is required to either haul in or pay out 10,000 feet of one inch wire rope by the ATF towing winch. Most of this delay results from the 2,000 feet per hour maximum operating speed of the winch. A faster winch and larger drum combination would materially reduce this time element.

d. To insure the ideal positioning of a barge in a deep sea moor, every effort should be made to secure all the legs of the moor as close together in time as working conditions permit. A long delay in securing the second leg to

a deep sea moor, particularly under wind conditions of greater than 20 knots, will probably result in the loss of the first leg due to undue strain on the first leg and/or the possibility of "sawing" as drifting may cause crossing of leg with the wire rope leading from another moor.

e. The winches on target barges and operational tugs should be tested to design specifications to insure their ability to handle the weights and tensions required against all foreseeable sea conditions. The barge should be self sufficient in hauling in or paying out wire rope to maintain or reach specified positions after it assumes control of a leg or mooring wire.

f. To facilitate positioning, each barge or moor should be checked daily for positioning and wire fatigue. It is much easier to make frequent small scope changes than it is to make radical large changes at less frequent intervals.

g. Equipment to be utilized in the deep water moor should be checked either at the point of origin or point of assembly of shipment to experiment site. Although not serious from the operational point of view, time was lost when it was discovered that "oval shaped" detachable links were shipped instead of the requested "pear shaped" type. This substitution doubled the amount of links ordinarily used.

h. Wire rope must be examined for broken strands, kinking indications or other abrasions. A more satisfactory system of marking wire rope should be established to enable the reader to determine the scope of wire rope payed out or hauled in. The present system of dabbing a splotch of paint every fifty feet on the wire rope as the rope unreels from the spool leads to confusion during the paying out process when a scope of four or five thousand feet has been reached. An automatic hand counter is much preferred to the present system of making marks on a board.

i. Fittings, shackles, links and other connecting devices must be checked at the site as to strength, appearance and holding ability. Pins or toggles should be welded into place. Two complete anchor leg units were lost due to spreading of bending shackles.

j. To reduce injuries and possible loss of life among personnel, effort should be made to provide sufficient time to establish moors and barges. Inasmuch as the handling of thousands of feet of wire rope, anchors, chains and

[redacted]L

clumps is awkward and dangerous under ideal weather conditions, schedules for the positioning of target barges should make allowances for adverse weather conditions. A minimum of four days per barge is considered sufficient time.

k. A detailed bottom survey of the experiment site is a necessity to enable each operating tug to ascertain the exact distance it can safely lower an anchor before letting it go. The accuracy of placing an anchor at a specified spot is greatly increased if the time interval between uncontrolled dropping and anchoring is reduced. The presence of reefs, pinnacles and bottom slopes usually fouls the anchor, cuts the wire rope or nullifies the weight of the clump.

l. The holding power of the anchor and the scope of wire rope used is dependent upon the usefulness of the clumps. The ideal situation exists when the clump is suspended from the ground ring above the ocean floor. A sloping or uneven bottom negates the clump's value.

m. Only two of the ATFs (USS MOCTOBI and USS TAKELMA) and one of the ARSs, (USS GRASP) assigned to the mooring operation had any previous experience in deep water moorings. All participated in the deep water mooring tests at Barbers Point in November 1957. Fifty percent of the personnel of these three vessels, including the three commanding officers, had been rotated since that time. It is strongly recommended that all operating vessels participating in the next deep water mooring experiment be given extensive on-the-job training at the selected site by actually laying legs and securing them to a barge. This training is all important especially if modifications are made to existing equipment.

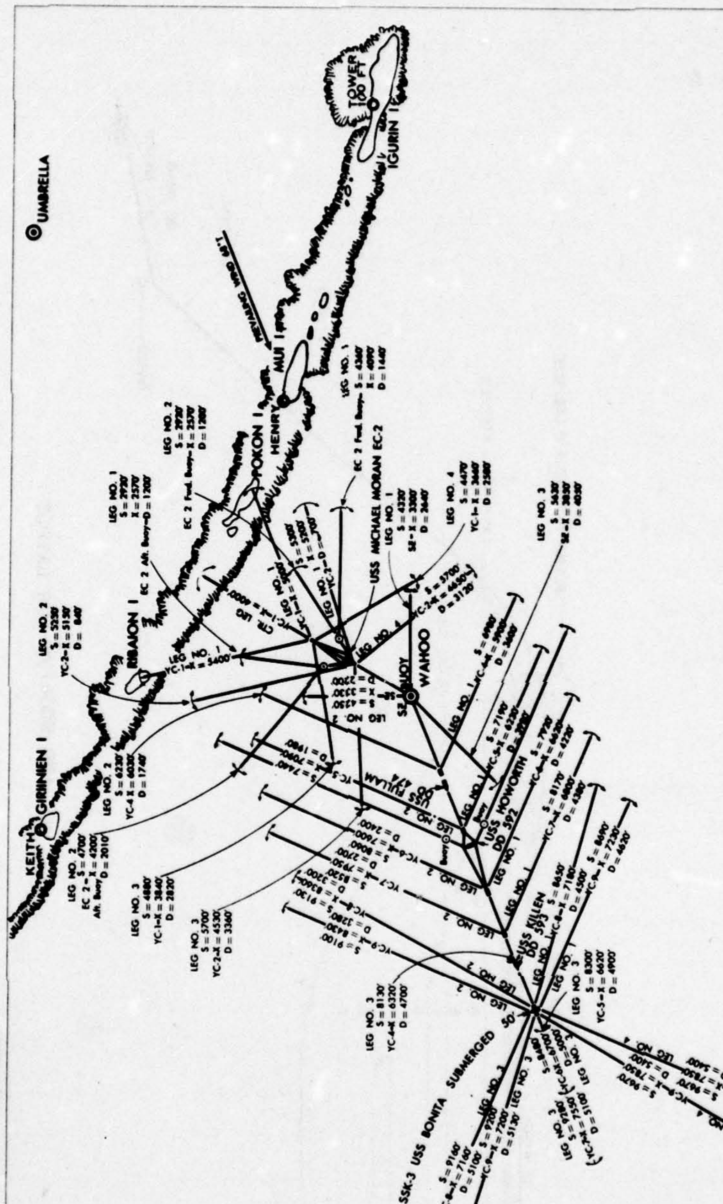
n. A minimum of fifteen skilled enlisted men is required on a barge to effect a satisfactory transfer of control of the wire rope from the tug to the barge. These men must be trained as a team and kept as a unit. The practice of assigning different personnel daily to the barge "working party" leads to loss of time due to "spot training" and creates dangerous working conditions inasmuch as the barge was continuously rolling and pitching.

[redacted]

UNCLASSIFIED

[redacted] [redacted]

[redacted]



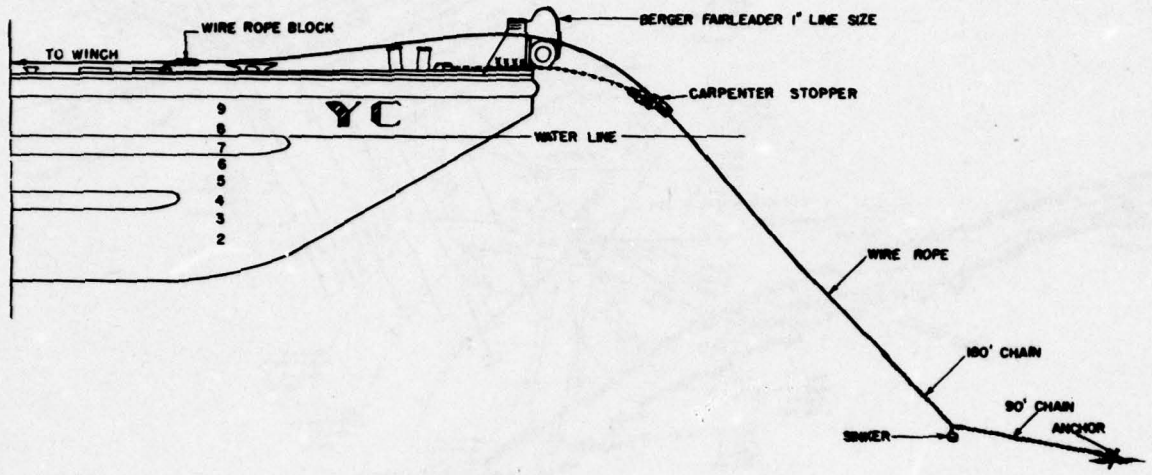
COMPLETE WAHOO ARRAY AS DESIGNED

Diagram 1

[redacted]

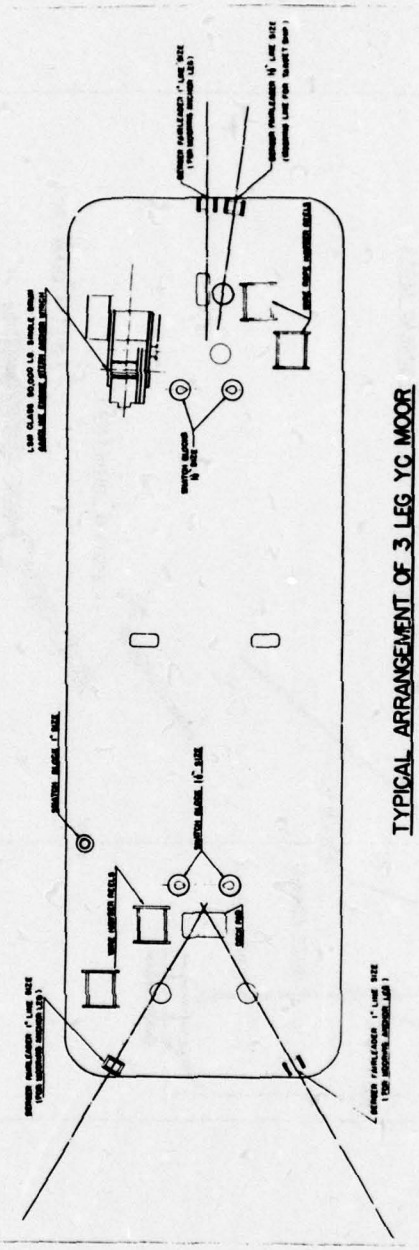
[redacted] [redacted]

UNCLASSIFIED



YC AND MOORING LEG LAYOUT

Diagram 2



TYPICAL ARRANGEMENT OF 3 LEG YC MOOR

Diagram 3

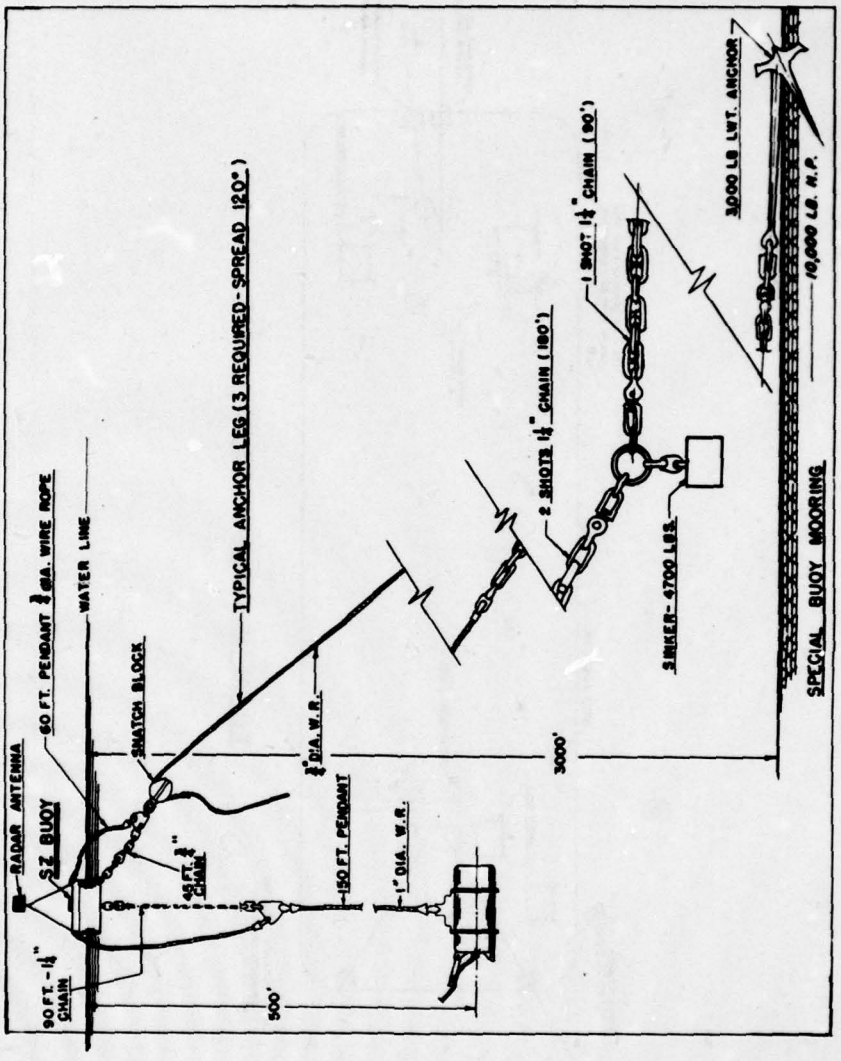
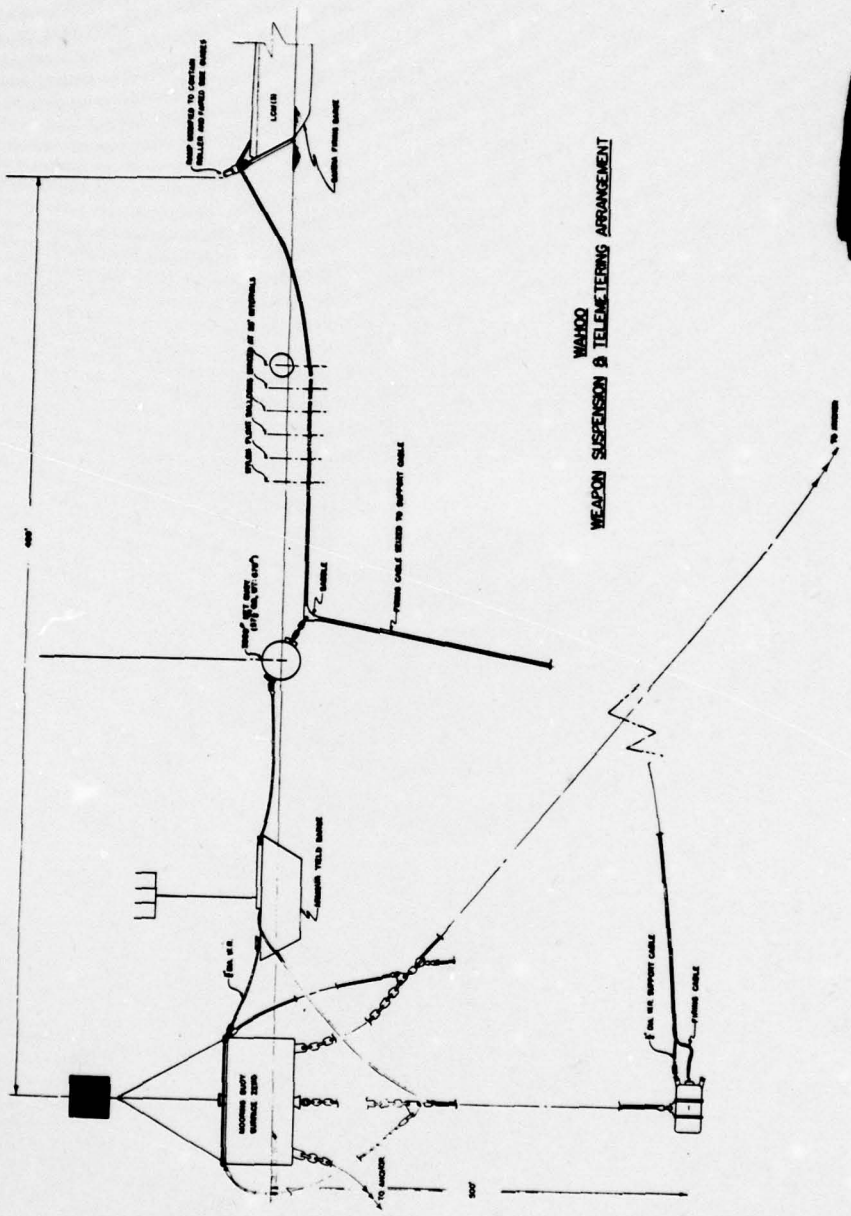

RADAR ANTENNA
SZ BUOY
90 FT. PENDANT 1 DIA. WIRE ROPE
WATER LINE
SNATCH BLOCK
TYPICAL ANCHOR LEG (3 REQUIRED - SPREAD 120°)
90 FT. 1¼" CHAIN
1" DIA. W.R.
150 FT. PENDANT
1" DIA. W.R.
900'
3000'
2 SHOTS 1¼" CHAIN (180')
1 SHOT 1¼" CHAIN (90')
3 RIKER - 4700 LBS.
3000 LB LWT. ANCHOR
10,000 LB. H.P.
SPECIAL BUOY MOORING

Diagram 4

[redacted]



[redacted]

Diagram 5

[redacted]ENTIAL

APPENDIX II

CHRONOLOGICAL RECORD OF UMBRELLA ARRAY MOORING OPERATIONS

General

Moorings for the UMBRELLA array target ships were made essentially in accordance with the original mooring plan with certain changes as noted herein. Surface zero was moved 12"N in latitude, and the line of the array was moved accordingly, because of the locations of other associated experimental equipment that existed locally. A new target array plan entitled "Eniwetok Atoll - Target Array for UMBRELLA" was prepared with the assistance of the Holmes and Narver drafting office. This plan shows the revised array for UMBRELLA target ships as finally installed.

Because the USS MOCTOBI had already placed mooring buoys for the four target ships in accordance with the original plan, it was necessary to move these buoys approximately 1200 feet in order to conform to the change in latitude for surface zero.

The USS BONITA (SSK-3) was added to the array at a radius of 2900 feet. SQUAW-29 and the EC-2 were each moved in to a radius of 1600 feet. DD-474 was placed at a radius of 2000 feet, DD-592 (broadside) at a radius of 3000 feet and DD-593 at a radius of 8000 feet.

20 May 1958

USS GRASP commenced righting YC-4 that had capsized during the WAHOO shot. YTBs 182 and 188, with divers, commenced salvage of Holmes and Narver BC barge that had sprung leaks and upended during a tow to Bikini. ATFs CHOWANOC, CREE and ARIKARA commenced recovery and relocation of target ships mooring buoys for the UMBRELLA array. TAKELMA reported to Project 6.7 for mine laying operations. BOLSTER commenced rigging for UMBRELLA surface zero buoy placement.

21 May 1958

BOLSTER laid and positioned UMBRELLA SZ buoy. ATFs CREE and ARIKARA completed recovery of target ships mooring buoys and made preparations for

placement in the new locations. CHOWANOC reported to Project 1.1. GRASP continued salvage operations for righting YC-4, and, assisted by YTBs and divers, moved Holmes and Narver BC barge into shallow water preparatory to salvage.

22 May 1958

BOLSTER made preparations and commenced rigging for mooring the SQUAW and the YFNB. MUNSEE recovered the mooring buoy for DD-593. GRASP, ARIKARA and CREE righted and pumped out YC-4. The diving unit, assisted by LCM-25, continued salvage work on the Holmes and Narver BC barge.

23 - 24 May 1958

GRASP continued salvage operations on the Holmes and Narver BC barge. BOLSTER continued to prepare for mooring the YFNB and the SQUAW. The CREE and ARIKARA commenced laying mooring buoys for the DDs in the UMBRELLA array.

25 May 1958

GRASP towed EC-2 to berth B-3 mooring. YTBs 182 and 188 nested the three DD target ships alongside the HOOPER ISLAND. BOLSTER took the SQUAW and YFNB under tow to moor in the array.

26 May 1958

The CHOWANOC continued to work with Project 1.1, TAKELMA with Project 6.7 and MUNSEE with Project 2.3 (coracles). The ARIKARA and the CREE, with the assistance of two LCUs continued the placement of mooring buoys for the target ships in the array. The GRASP made preparations and commenced rigging for mooring the BONITA and YC-7 in the target array. The BOLSTER completed mooring the YFNB and the SQUAW. For submerging the SQUAW, four weights, 4700 pounds each, were rigged to padeyes with 1¼" stud link chain, cut to proper length, for submergence to 50 foot depth to centerline.

The CREE completed the placement of mooring buoys for DD-592 and DD-593 target ships. The ARIKARA completed the placement of mooring buoys for DD-474 and the EC-2 target ships. The BOLSTER, with the assistance of the crew of the YFNB, laid the Taylor Model Basin instrument cable between the YFNB and the SQUAW. The GRASP continued mooring the BONITA and the YC-7. The MUNSEE continued to moor coracles for Project 2.3.

[redacted]

27 May 1958

The GRASP and the ARIKARA continued salvage work on the Holmes and Narver BC barge. The BOLSTER and the YTBs completed the mooring of the photographic barge in the UMBRELLA array.

28 May 1958

The CHOWANOC, assisted by YTB, completed mooring NOL barge for array "17" and "21". GRASP completed mooring the BONITA and YC-7. The diving team with LCM-25, installed "lead turtles" (self-contained wave recorders, held in place on the bottom by 1000 pound faired lead weights).

29 May 1958

GRASP resumed salvage work on Holmes and Narver BC barge.

30 May 1958

The diving team continued to place "lead turtles".

31 May 1958

Project work was continued by MUNSEE on Project 2.3 and TAKELMA on Project 6.8. LCM-25, with divers, continued laying "lead turtles".

2 June 1958

TAKELMA, with the assistance of YTBs 182 and 188, moored DD-593 in the array, stern to the shot. YTB 188, with the assistance of two "pusher boats", LCMs 21 and 22, moored LCU shot barge to UMBRELLA SZ buoy. The LCM firing barge had previously been placed in the well deck of the LCU. Armour Research Institute instrumentation was rigged in the LCU. The CREE took the EC-2 in tow for the target array area.

3 June 1958

TAKELMA, assisted by the YTBs, moored DD-474 in the array, stern to the shot. ARIKARA towed DD-592 to the array area. The CREE, assisted by the YTBs, moored the EC-2 in the array, port side to the shot. The GRASP commenced loading the weapon handling "A" frame at ELMER deep water pier.

4 June 1958

ARIKARA, assisted by YTBs, moored DD-592 broadside in the array, starboard side to the shot. GRASP loaded UMBRELLA weapon at ELMER deep water pier.

5 June 1958

All Task Units held full dress rehearsals for UMBRELLA. The SQUAW was

[redacted]

dived successfully. A dummy weapon was laid and retrieved by the GRASP. Full power runs, washdown operations, and countdowns were performed.

6 June 1958

Task Units continued preparations for "U" Day.

7 June 1958

The GRASP placed the BONITA in the moor with counter-weights rigged for submergence to periscope depth, (50 foot depth to keel). The counter-weight ballast clumps were arranged in pairs of 4700 pound cast iron weights, hung off from the #2 and #3 sets of padeyes, port and starboard, with 1¼" stud link chain, 115 feet long each, sized to permit submergence of the submarine to periscope depth, 50 feet depth to keel.

The BONITA was moored in combination with the YC-7 arranged for instrumentation. The YC-7 was placed in a conventional three-point moor, (single leg upwind) using 3000 pound LWT anchor, 4700 pound clump, two shots of 1¼" stud link chain and 600 feet of 1" diameter wire rope for each leg, dead-ended on deck to chafing chains made fast to bitts. The BONITA was streamed from the YC-7 by the stern on a 1 1/8" diameter mooring wire led through a Berger fairlead on the YC and attached by carpenter stopper to deck-pad. From the bow, the BONITA was anchored, facing the shot, on a single anchor leg, made up as above. The BONITA was successfully "test dived" with personnel on board.

8 June 1958

At 0630 GRASP departed ELMER deep water pier and proceeded to UMBRELLA site. All moors for target ships were tightened and adjusted. Dry runs were conducted throughout the array. The BONITA was successfully dived without personnel on board.

Remarks

The final position of the surface zero buoy was 100 feet out of charted position. The radii for all target ships from surface zero were adjusted to conform with this displacement. The bow anchors for the target ships were placed as follows:

DD-474 - A 4000 pound Navy stockless anchor was placed 10° to port of centerline at 105 fathoms scope. A 3000 pound LWT anchor was led aft on

[redacted]

it's chain at 75 fathoms scope and dropped off the stern at 20° to starboard of centerline. This was done by the Task Force Mooring Officer as a precautionary measure to prevent the ship from ramming the DD-592 at shot time.

DD-592 - (Broadside). Six thousand pound LWT anchors were used both port and starboard. The starboard anchor was placed 50° off centerline at 135 fathoms scope. The port anchor was placed 10° from centerline at 75 fathoms scope.

DD-593 - One 4000 pound Navy stockless anchor was used and placed 10° to port of centerline at 75 fathoms scope. The ship held well in position on this anchor and no starboard anchor was used.

EC-2 - The EC-2 was moored by the bow with her own anchors and chain, placed in accordance with plan. All ships were moored by the stern to buoys that were anchored on 3-point moors in accordance with plan.

9 June 1958 - "U" Day

0630 - GRASP commenced lowering weapon at surface zero. 0655 - SQUAW dived. 0720 - SSK-3 dived. 0726 - Weapon on bottom. Sandia firing cable and Armour Research Institute cables were passed to LCU-548 instrumentation barge for connecting up. GRASP dived on weapon and found it's placement satisfactory, except that the Armour coaxial cable had been kinked and broken above the last cable clamp.

Washdown was observed to work on all target ships prior to the shot. The entire target array was well in place and appeared to be properly positioned. Weather was clear with scattered clouds with wind 15 to 17 knots, gusting to 20 knots, from 060° to 070° - swells approximately 4 feet in height - visibility hazy.

0815 - GRASP cast off from SZ buoy and proceeded to observation station.

0855 - Anchored on station bearing 046° at 7300 yards from surface zero.

H-hour - Originally set for 1100, was postponed to 1115.

1115 - H-hour - The shot appeared as a huge depth charge in shape and appearance with a high rising central column and rolling base surge that enveloped all target ships and obscured the nearby islands from view. The base surge appeared to reach out for a distance of approximately 10,000 feet downwind and a somewhat lesser distance upwind. The coral bottom was pulver-

[redacted]

ized and the water was churned to milky white in the immediate area of the shot, that soon spread out to a distance of at least 6000 feet in all directions. Immediately after the shot the USS ARIKARA entered the shot area and obtained water samples. At approximately H+1 hour the GRASP and BOLSTER entered the array area. GRASP commenced to surface the BONITA by means of divers and the submarine's own air banks. The BOLSTER commenced to surface the SQUAW with air from the YFNB.

Upon entering the array area near the BONITA, radiac meter readings at 1300 hours indicated 100 mr over water, growing to 380 mr over water at 1320 hours and 180 mr in the water at the surface. A radiac sub-surface probe gave gradually increasing radiation readings with increasing depth to about two roentgens at 140 feet depth and 30 roentgens on the bottom. At 1355 the GRASP reported 350 mr at the seachest.

1504 - the BONITA surfaced. 1605 - The BONITA was taken in tow by the CREE to shallow water for removal of ballast weights. 1615 - The GRASP cast off from YC-7 and returned to port for removal of the "A" frame. 2000 - The BONITA was nested alongside the HOOPER ISLAND. During the day the BOLSTER surfaced the SQUAW several times, but had difficulty in keeping her surfaced, because of leaking air hose. The BOLSTER remained in the area over night with the YFNB and the SQUAW. The MOCTOBI stood guard over the other target ships. The following conditions of the UMBRELLA array were observed immediately after the shot:

EC-2 - Port side to the shot - At first, from the observation station, the EC-2 appeared to have dragged it's moorings and to be drifting toward shallow water. Subsequent examination, close-up, revealed that the mooring wire to the stern buoy had carried away but that the ship was still held by it's bow ground tackle and had swung around into the wind and was holding well in it's same relative position from surface zero. The washdown system stopped working.

DD-474 - Stern to the shot - The mooring wire to the stern buoy parted. The ship swung around with its head into the wind and continued to hold well on it's bow anchors, with it's stern approximately 300 feet away from the DD-592. The 3000 pound LWT anchor that had been placed off the

stern, 20° to starboard of centerline, held and prevented the ship from drifting into the DD-592. The washdown system continued to work effectively.

DD-592 - Broadside to the shot - All moorings held well and the ship maintained it's position in the array. The washdown system continued to work well.

DD-593 - Stern to the shot - There was no change in the position of this ship in the array. All moorings held well. The washdown system continued to work effectively.

YFNB-12 - Stern to the shot and SQUAW-29 - Bow-on to the shot - All moorings were intact. The washdown on the YFNB continued to work well.

SSK-3 - Bow-on to the shot and YC-7 - The upwind mooring wire from the YC to it's buoy carried away and the YC swung around on it's starboard (northerly) downwind anchor leg and came to rest over the SSK-3. The port (southerly) downwind anchor leg of the YC carried away. The SSK-3 downwind anchor leg carried away also, but the anchor and it's crown buoy remained in place near the shot.

10 June 1958

GRASP surfaced SQUAW, retrieved ballast weights, slipped moorings of both YFNB and SQUAW and towed into inner harbor and anchored. ARIKARA recovered stern buoy of EC-2 and salvaged all anchors, chains and clumps. CREE recovered and towed YC-7 into inner harbor. MOCTOBI took DD-593 in tow in the array area. MUNSEE and TAKELMA worked on mine recovery. BOLSTER operated with Project 6.8. CHOWANOC retrieved gear for Project 1.1. BONITA crew boarded submarine and lit off plant.

11 June 1958

The CREE, MOCTOBI and ARIKARA took DDs 592, 593 and 474 in tow, respectively, into inner harbor, and with assistance of YTBs, nested the ships alongside the HOOPER ISLAND. The CREE returned to the array area, took the EC-2 in tow and anchored the ship in the inner harbor with the ship's own ground tackle. Power for the windlass of the EC-2 was obtained from a Holmes and Narver air compressor, landed aboard by means of an LCU with crane. YTB-182 with pusher boat-21 towed BONITA away from HOOPER ISLAND during nesting of DDs.

The submarine returned to nest alongside DDs under own power. MOCTOBI retrieved buoy of DD-593 and salvaged anchors, chains and clumps.

12 June 1958

GRASP commenced operations to remove 120 ton lead keel from SQUAW to compensate for ruptured ballast tanks and permit ocean tow. Three anchor legs for the YFNB, three for the SQUAW, one for the DD-592, and the DD-474 and DD-592 stern buoys with anchor legs, need to be retrieved to complete recovery of all moorings for UMBRELLA target ships.

All UMBRELLA target ships and submarines have now been safely retrieved and returned to port and are ready for preparation for sea tow.

Comments and Conclusions.

Mooring of ships in the open sea in depths to 1000 fathoms has been shown by the success in the WAHOO phase of Operation HARDTACK to be feasible under moderate conditions of wind and sea, 25 knot winds and 10 to 15 foot waves.

Combination of conventional components of ground tackle (anchors, chain, clumps, wire rope and fittings) adequately designed, proved effective and satisfactory for the period demanded.

The margins of feasibility and adequacy of the very deep water moorings were narrow. With this in mind, normal care and precautions must be taken quite seriously and the hazardous nature of the operation must not be overlooked.

A characteristic feature of deep water mooring is the transient and localized onset of overstress. Components and fittings may fail suddenly in the process of laying the moor or in a sudden surge of the sea. The point where a wire changes in curvature or where it is pinched, or kinked, or chafed, or otherwise damaged by mishandling, may limit the life of the moor as a whole. The excess in tension at the surface, or the concentration of damping effects at the barge, or clump, or anchor, is more important than the average load on the wire. The rate of onset of a load, or the number of reversals in stress due to the continued motion of the sea, may cause a failure at a particular point long before the mean loading or fatigue is excessive. Thus dynamic problems, hitherto neglected, must be taken into consideration. The kind of effect here envisaged includes more than the mechanical type ordinarily

[redacted] [redacted]

contemplated. The acceleration of corrosion under stress may be more important in deep sea operations than in familiar situations. The handling of large weights on long lengths of wire rope is not ideally provided for with present equipment. It may be advisable to study special designs for special deep sea projects.

The difficulties are enhanced at sea when it is necessary to:

1. Transfer personnel.
2. Transfer material and equipment.
3. Establish a definite and precise position or attitude.
4. Hold the moor over a long period.
5. Hold against high winds and seas.
6. Provide a stable platform.
7. Hold several ships in close proximity.
8. Change moorings.
9. Recover moorings.
10. Conserve material.
11. Maneuver accurately.
12. Reduce operating time.

Careful attention must be paid to:

1. Suitability of fittings and materials.
2. Arrangement and sequence of components.
3. Possibility of kinks and fouling at all stages.
4. Positions where chafing can occur.
5. Positions of possible overstress.
6. Positions of possible fatigue.

Recommendations

1. How this undertaking could best be accomplished in the light of present knowledge:

a. More time on the job would be helpful, especially under the adverse conditions of wind and sea that prevailed during the deep mooring operation.

b. More precise advance knowledge of weather, wind, and sea conditions should be available.

[redacted] [redacted]

[redacted] [redacted]

c. Preliminary training of personnel in advance would be well worthwhile.

d. Investigation and resolution of dynamic forces to be expected for the prevailing conditions should be completed and taken into account early in the design planning stage.

e. Improved maneuverability of the ships placing the moorings would enhance the efficiency of future operations. For example, ATAs, though not as well powered as ATFs, are more maneuverable, and would probably prove more suitable. Two ARSs and two YTBs proved adequate.

2. It is recommended that study and development be carried on steadily in order to be prepared when sudden special or emergency requirements arise to provide deep and precise moors. The program should include:

a. Study of motions and forces in moorings.

b. Study of corrosion and fatigue in materials under stress in deep water moorings.

c. Study of material requirements in deep water.

d. Development of new equipment.

e. Development of techniques.

f. Methods to establish precise position.

g. Development of instruments and devices to measure stresses and other quantities important in mooring.

3. YCs should be provided with weather tight covers for winches to insure that while they are under tow they are completely waterproof.

4. An adequate rigging platform is a major requirement, as in most forward areas dock space is seriously limited or non-existent. In the case of WAHOO and UMBRELLA an EC-2 hull was used as a rigging platform, and it proved to be very satisfactory.

[redacted] [redacted]

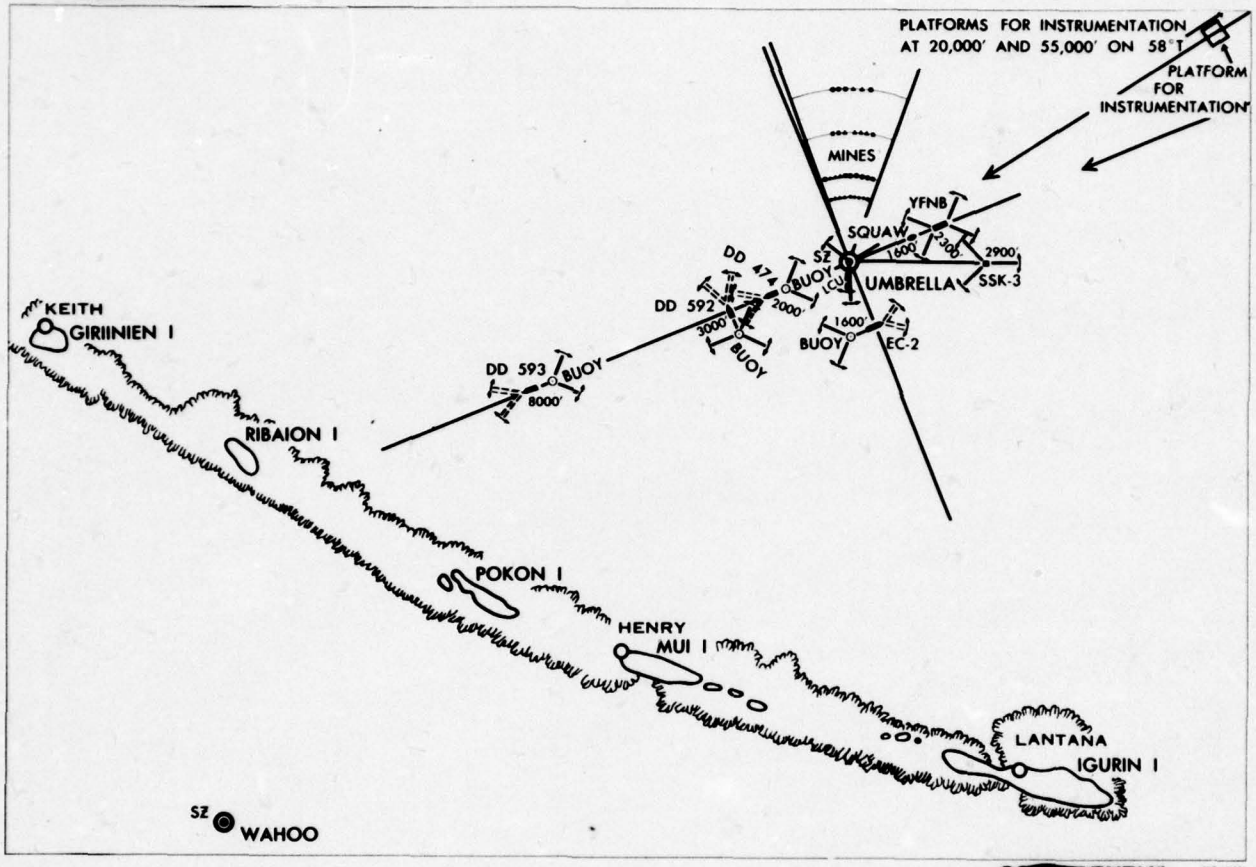


Diagram 6

[redacted]

APPENDIX III

DIVING OPERATIONS REPORT

SHIPS AND PERSONNEL

Three ships assigned to Operation HARDTACK were to provide the major portion of diving capability:

a. Two ARSs, USS GRASP (ARS-24) and USS BOLSTER (ARS-38), assigned for the duration of diving requirements. (About 9 divers each).

b. One ASR, USS CHANTICLEER (ASR-7), assigned for approximately one month early in the Operation. (28 divers).

Six ATFs, also assigned to the Operation, were expected to provide limited additional diving capability. (About 3 divers each).

A special diving team was to be assembled on TAD orders. This was to consist of one officer and eight enlisted divers. The officer and three of the enlisted divers were to be qualified in SCUBA diving.

The services of a Medical Officer qualified in deep sea diving and preferably also in SCUBA diving were requested from the Bureau of Naval Personnel via the Bureau of Medicine and Surgery.

a. The intended primary functions of the Diving Medical Officer were to oversee divers and diving operations from the standpoint of health and safety and to conduct or supervise treatment in the event of diving accidents.

b. LCDR E. H. LANPHIER, (MC), USN, a qualified Submarine Medical Officer then attached to the Experimental Diving Unit, U.S. Naval Gun Factory, Washington, D.C., was given TAD orders to Task Group 7.3. He reported in Washington in mid-February 1958, was sent to the Weapons Orientation Advanced Course at Sandia Base, and arrived in the EPG in mid-March.

c. Prior to reporting he was able to participate to some extent in planning and in procurement of material related to diving, but the majority of his work in preparation for diving operations had to be accomplished after arrival in the EPG.

EQUIPMENT

For the most part, diving equipment was provided by the ships concerned.

[redacted] APPENDIX [redacted] TO SECTION 3

These were already supplied with equipment sufficient for their own use.

Special provisions were made for outfitting the Diving Team with one deep sea diving outfit, two lightweight outfits (minus compressors), SCUBA cylinders and regulators, rubber suits, and a small portable high-pressure compressor for charging SCUBA cylinders.

A variety of items such as swim fins, face masks, divers' watches, and wrist depth gages were obtained by open purchase.

Two Stephenson "Minuteman" resuscitators were obtained. One was intended to remain with the diving team, the other to be retained by the Diving Medical Officer.

Other emergency medical equipment was assembled at the Eniwetok Proving Ground by the Medical Officer or under his direction:

a. The Diving Medical Officer's medical emergency bag.

b. Emergency material to be kept in or near recompression chambers.

c. First Aid boxes for diving boats.

USE OF NEW DECOMPRESSION TABLES

CTG 7.3 requested and received permission from the Bureau of Medicine and Surgery and the Bureau of Ships to employ the new U.S. Navy Standard Air Decompression Tables. These had been developed and tested by the Experimental Diving Unit and approved by the Bureaus concerned; but they were not to be authorized for general use until their publication in Part I of the new U.S. Navy Diving Manual, then in the final stages of preparation.

The expected advantages of using the new tables amply justified seeking special permission. Operation HARDTACK was to be their large scale application in the field.

UNDERWATER RADIOLOGICAL SAFETY

The Diving Medical Officer and Staff Radiological Safety Officer began collaboration concerning underwater radiological safety problems well in advance of the former's attachment to the Staff. It became apparent that Task Group 7.3 would have to assume full responsibility for the radiological safety of divers. Little information was available to assist in preparation for this function.

a. It appeared unlikely that any event other than UMBRELLA would present

any significant hazard; but it was in connection with this event that divers would have their most important employment.

b. Few convincing predictions concerning the magnitude of the problem were possible because no previous shot had been fired under sufficiently similar conditions.

c. Lacking proof to the contrary, it was held necessary to assume that diving operations would be required in the presence of a considerable underwater radiological hazard following that event.

A few assumptions appeared reasonable as a basis for planning:

a. It was unlikely that the water itself would present a serious problem except in dives required very shortly after an underwater event.

b. It seemed almost certain that large quantities of highly radioactive material would be deposited on the bottom near UMBRELLA zero.

c. The possibility that such material would also be carried by deep currents and deposited over a wide area deserved serious consideration.

d. The shielding effect of water would operate to a diver's advantage unless he was virtually lying on the bottom or in contact with activated structures. However, the stirring up of radioactive materials from the bottom was highly likely, and the consequences of this could not be predicted.

e. It was recognized that no diving dress would provide protection from gamma radiation. It was felt, however, that the deep sea dress would provide complete protection from beta activity and that if necessary, even SCUBA divers could be utilized in its presence if they were provided with appropriate suits and SCUBA units having full-face masks.

It was decided that only in case of extreme necessity would authorization be sought for exposing divers to more than the total allowable dose set forth as the limit for Operation HARDTACK personnel as a whole.

Necessities for dealing with the underwater radiological safety problem included:

a. Means of measuring radioactivity in diving areas.

b. A system for predicting probable exposure at the time of a dive and for regulating and conserving exposure of divers by planning.

c. A reliable and reasonably rapid method for determining the extent of actual exposure during a given dive.

d. Explicit radiological safety instructions for diving ships and activities.

e. Central recording and surveillance of divers' exposures, in addition to the standard film badge system applied to all personnel.

f. Personnel protection, such as suits for SCUBA divers.

Early steps taken to provide these essentials included:

a. Procurement of samples of the type of film badge to be used throughout Operation HARDTACK. These samples were submitted to the Experimental Diving Unit for evaluation. They were found to withstand the pressure at depths to 300 feet without leakage or damage. They were considered suitable for use by divers without special protection of the badge or any precautions other than reasonable care. Since rapid processing service would be available, use of these badges was considered preferable to attempts to provide individual pressure proof dosimeters. The contemplated approach involved supplementing the diver's regular badge with a "dive badge" to be worn only during a given dive or a given day's diving.

b. Arrangements were made for delivery to Task Group 7.3 at the EPG, at the earliest possible date, of two AN/PDR-50 (XN-1) radiac sets which were then in the process of being manufactured for the Bureau of Ships. These instruments provide a pressure-proof radiation probe on 200 feet of cable. A hand operated reel with enclosed slip-rings is associated with the meter unit, which remains on the surface.

c. Preliminary consideration was given to methods of measurement to be used in the event that the depth probe units failed to arrive in time or proved unsatisfactory. It was determined, for example, that Task Group 7.1 radiological safety had ordered six diver-held radiac meters that would probably be available to Task Group 7.3 and suitable for use at the depths concerned. Methods involving measurement from water and bottom samples were also considered.

d. Dry-type rubber suits were procured for use by SCUBA and "lightweight" divers.

Preparation of radiological safety instructions for divers required very

extensive consideration. The instruction was not completed and issued until shortly before UMBRELLA event.

DIVING INSTRUCTIONS.

Instructions for Diving Operations during Operation HARDTACK were prepared by the Diving Medical Officer and issued as CTG 7.3 INSTRUCTION 10470.1 of 14 April 1958. This included four enclosures:

Enclosure (1). General Diving Instructions. Among other points, this directed employment of the new decompression tables in all Task Group 7.3 diving operations to which they applied. It also directed a report concerning each dive on a prescribed Record of Dive Form.

Enclosure (2). Revised U.S. Navy Air Decompression Tables. This enclosure reproduced the new tables and all pertinent information from section 1.5, Diving Tables of the new diving manual.

Enclosure (3). Instructions on management of diving casualties. This consisted of reproductions and excerpts of several valuable sections of the new manual, not available elsewhere. It omitted information on harmful underwater animals. This was later supplied as CTG 7.3 NOTICE 6310 of 3 June 1958, also derived from the diving manual.

Enclosure (4). Radiological Safety Measures for Diving Operations. This was not issued until 3 June and was to be in force only for the duration of significant hazards following the UMBRELLA event. It specified methods of estimating exposure of divers from measurements obtained, presented aids for planning optimum utilization of divers, prescribed procedures to be followed in the use of film badges in diving, and discussed various precautions.

SUPERVISION OF DIVERS AND DIVING

Upon arrival, each ship assigned to Operation HARDTACK and known or considered likely to have divers aboard was requested by message to submit a one-time report concerning its divers: Name, rate, serial number, qualification held, status of qualification (up to date or lapsed), and whether annual divers' physical examination had been accomplished.

When this information was received, the Diving Medical Officer proceeded with these steps:

[redacted] [redacted]

a. Registered each diver, assigning him a page in the general diving log, and recording the pertinent data.

b. Assured that the ship concerned received an appropriate number of copies of the Diving Instruction, record of Dive Forms and the like.

c. Issued Diver's Identification Cards. (The Card was slightly smaller than the standard security identification badge and was laminated. It was worn with the badge by any diver billeted ashore or going ashore after a dive. The card called attention to the fact that the man had been exposed to high air pressure and gave the telephone number by means of which the Diving Medical Officer could be reached at any hour in the event that the man suffered unconsciousness or any unexplained illness).

d. Listed the names of all divers overdue for annual divers' physical examination so that necessary appointments could be made.

The Diving Medical Officer then attempted to find a practical time and place for interim physical examination of all divers of the ship or activity concerned and for a briefing session on the use of the new tables and other diving matters.

Intended functions of the Diving Medical Officer also included:

a. Special attention to the Diving Team.

b. Visiting the various diving ships.

c. Spending as much time as possible at the actual scene of diving operations.

d. Being available and readily reached at all times, day and night, in the event of any diving accident or condition requiring recompression treatment or other emergency medical attention.

SHIPS AND PERSONNEL

In every instance, the diving ships performed their assigned work efficiently and well.

The Task Group 7.3 Special Diving Team demonstrated its worth in numerous connections.

a. It accomplished a large number of tasks for which the diving ships were not required, were not suitable, or could not be spared.

b. Its mobility was a distinct asset.

c. Although it generally worked independently, the Team was used to supplement the diving capability of ships on several occasions.

[redacted] [redacted]

[redacted]

d. Explosive Ordnance Disposal Team 11 (one officer and five men, all SCUBA divers) was assigned to the Operation briefly in connection with Project 6.7, and was an extremely effective group.

e. It was observed that most of the unique capabilities of the Diving Team and Explosive Ordnance Disposal Unit group stemmed from capability for SCUBA diving. More SCUBA-qualified members could readily have been used on the Team, while the non-SCUBA qualified men had relatively little employment. On numerous occasions, SCUBA divers had to be borrowed to permit efficient operations.

f. In most situations, the Team worked effectively from LCM-25, a modified craft with winch machinery, large bow "A" frame, and modified ramp. Addition of a canvas awning over the mid-section and a removable diving ladder increased its suitability. It was evident that no smaller craft would have been suitable because of consistently rough water and the nature of most of the work. Lifting capability was required for a large portion of jobs. In several instances, it was necessary to use an LCU with, or instead of, the LCM-25 because of greater stability and/or its ability to anchor itself satisfactorily. On at least two occasions, rough water caused breakage of the LCM-25's ramp chains while the ramp was being used as a diving platform. On one of these occasions, a diver was injured.

g. In the opinion of all divers concerned, an LCU with some type of crane or its equivalent would make the best craft for Diving Team operations. The LCU ramp makes a superior diving platform, stability and anchoring capability are great advantages, and ability to drive a truck loaded with diving equipment aboard saves a great deal of time and effort. If an LCU could be permanently assigned to the team, ability to store equipment aboard would also be a great advantage.

h. The fact that the team was quartered on Site FRED while most diving operations originated from Site ELMER was the source of much inconvenience and caused the loss of at least one hour of working time each day. The fact that the Team often could not obtain a truck for transporting SCUBA cylinders and other heavy gear ashore was a distinct problem.

i. Conducting extensive diving operations with the nearest recompression chamber nearly ten miles away, as the Team was frequently obliged to do, is not

[redacted]

good practice although such must often be condoned for reasons of practicability. A portable chamber could readily be accommodated aboard an LCU.

Of the total of 85 divers registered in the Task Group 7.3 diving log, 76 made at least one recorded dive during the Operation. Individual divers who made between 30 and 60 dives each were not uncommon; but a large number made five or less. This apparent waste of diving capability is misleading since most of the "unemployed" divers were aboard ships that do little diving and were not aboard primarily as divers. However, such men were mobilized to assist with important diving jobs on several occasions. They represented a valuable reserve. It should also be noted that lack of continuous employment of divers did not indicate an over-supply. The need for diving operations was dependent on many factors and could not be spread evenly over the time of the Operation.

As was the case with the Diving Team, the operation as a whole could have utilized more SCUBA-qualified divers. Forty percent of all reported dives were made with SCUBA and the demand for SCUBA divers was such that the proportion would doubtless have been greater had the capability existed. The advantages of SCUBA diving were particularly notable in jobs that lay at considerable depth but that could be accomplished quickly by a mobile diver who could work from a minimal platform and whose activity caused little or no loss of visibility due to disturbance of the bottom. A great proportion of the work fell in this category. Especially as experience was gained, there was no hesitancy to use SCUBA in depths of 150 feet or more and for times that required decompression stops on ascent. In fact, failure to do so would have made some jobs nearly impossible or would have very greatly increased the amount of time and effort required.

The value and competence of the diving hospital corpsmen, one aboard the ASR and each ARS, deserves special mention.

a. These men not only did their full share of the actual diving, in addition to the normal work of hospital corpsmen, but served important additional functions. The presence of a good diving hospital corpsman assures that injuries and accidents will be kept to the minimum in both numbers and consequences. It does not eliminate the need for a diving medical officer but is

especially important when the latter cannot be present at the immediate scene of all diving.

b. A diving hospital corpsman would have been an extremely valuable member of the diving team.

c. A potentially serious problem arose when the corpsman aboard the USS BOLSTER (ARS-38) required prolonged emergency leave. This was particularly unfortunate because the ship's recompression chamber is of the single-lock type. This means that whoever accompanies a patient initially must remain with him throughout treatment and cannot be relieved or assisted. He must therefore be competent to perform any type of examination or therapeutic measure that may be required. Exceptional cooperation by all commands concerned permitted exchanges with Pearl Harbor personnel which resulted in keeping a highly qualified corpsman aboard USS BOLSTER as long as she was at the EPG.

EQUIPMENT

In general, the diving equipment available was adequate. However, several important exceptions must be noted.

a. The diving team was expected to do a considerable amount of work with the surface-supplied diving outfits provided. However, the depth and nature of most jobs, the inherent limitations of the gear, and the impossibility of securing an adequate compressor rendered this equipment largely useless. This also greatly limited the employment of the non-SCUBA members of the team.

b. The large amount of SCUBA diving that was required made the supply of SCUBA cylinders only marginally adequate. The number of regulators provided was frankly inadequate, and repair parts and tools were inadequate or lacking. It was only by borrowing -- including the use of regulators and tools belonging to individual civilians -- that the required capabilities were maintained.

Securing suitable high pressure air for charging SCUBA cylinders was likewise a problem. Only USS CHANTICLEER (ASR-7) had ample charging capability. The ARSs and the team had only small portable compressors that are by no means intended for, nor equal to, a diving operation of any magnitude. Upon the USS CHANTICLEER (ASR-7) departure, these appeared to be the only source of air for Task Group 7.3 SCUBA diving. However, it was discovered that Holmes and Narver had a limited but adequate source of suitable air on Site ELMER. It

[redacted]

was possible to make arrangements to use this source on a work-order basis, and from that time most of the available SCUBA cylinders were brought ashore for charging almost daily. Except for the expenditure of manpower required, this procedure was satisfactory.

Departure of USS CHANTICLEER on 16 May also left a great deal of diving to be done with only the single lock compression chambers on the ARSs available in the area for treating accidents. While these are infinitely better than nothing and are adequate for treatment of mild cases of decompression sickness, their use for treatment of air embolism or a serious case of decompression sickness would present formidable problems.

a. Unless he could be present at the moment of onset of such an illness, the Diving Medical Officer would be unable to get to the patient. If he were in the chamber, he would have to remain for the full duration of treatment (up to 38 hours) even if another serious accident required his services.

b. The barely adequate air systems of these ships make it impossible to ventilate the chambers sufficiently to control temperature. Treatment even on a 4-hour table was found to represent a severe heat stress for both patient and tender. With long-table treatment and a seriously ill patient, this could readily have had serious consequences.

c. An attempt at solving the temperature problem was made by storing in the ship's freezer several containers of ice for use in the chamber. The ship's limited ice-storing capacity was supplemented by a larger supply of ice in a Navy refrigerator ashore. The use of ice had little effect on actual chamber temperature but did permit keeping the occupants from serious overheating by direct application of cold towels, etc.

DECOMPRESSION TABLES: DIVING ACCIDENTS

The importance of decompression in HARDTACK diving operations is indicated by the fact that 44% of all recorded dives required decompression and that 31% of all tabulated underwater time was spent in ascent and decompression. The new tables offered several important potential advantages, and all these materialized convincingly.

The actual amount of time and capability saved by these tables will be

[redacted]

estimated and communicated in a separate report by the Diving Medical Officer. The figures are expected to be impressive.

The primary concern in applying new decompression tables on a large scale in the field for the first time is that the incidence of decompression sickness might prove unacceptable. For a brief period early in diving operations, it appeared that this might be the case. However, only five cases occurred during the whole operation: an incidence of 0.32% of all dives and 0.73% of dives requiring decompression stops. This is a very gratifying record; and preliminary analysis of the data indicated that it was accomplished without use of large "safety factors", as had become common practice with the old tables.

Of the five cases of decompression sickness that occurred, none were alarming in nature.

The incidence of other mishaps and illnesses among divers was also low. Two men suffered lacerations severe enough to require stitches. There were no reported injuries due to marine life other than a few minor episodes attributed to jellyfish. Minor cuts and abrasions were numerous but uncomplicated. Medical conditions commonly associated with diving in warm climates were of negligible importance. In summary, very few manhours were lost due to any medical problem.

RADIOLOGICAL SAFETY

Joint handling of the underwater radiological safety problem by the Diving Medical Officer and Staff Radiological Safety Officer proved a satisfactory arrangement. Both participated in planning the basic approach and in such matters as means of obtaining necessary measurements. The Diving Medical Officer took responsibility for preparing the "Divers' Radiological Safety Instruction", making actual measurements of underwater radioactivity, overseeing the divers' film badge procedures, and maintaining the special record of exposures related to diving. The Staff Radiological Safety Officer kept him informed constantly of cumulative readings obtained from divers' regular badges.

The AN/PDR-50(XN-1) radiac instruments arrived in time and proved extremely useful.

[redacted]

a. To protect the probes from damage, each was suspended on shock cord inside a faired aluminum cage.

b. The cables were marked with tape to indicate 10-foot increments of depth.

c. The instruments were recalibrated with a known source. One was found to be inaccurate. Although the "battery check" reading was correct, replacement of batteries corrected the defect.

d. As modified for protection, the instruments proved fully satisfactory in use.

e. The only suggested improvements were to:

(1) Decrease the weight.

(2) Improve rust prevention.

(3) Provide a portable calibration source, and

(4) Make the "battery-check" indication more reliable.

Regular provision of a protective cage like that constructed locally would be desirable.

Availability of the Task Group 7.1 diver-held instruments as a standby proved uncertain. Consequently, three AN/PDR-27 instruments were modified slightly and turned over to USS HOOPER ISLAND (ARG-17) for construction of pressure-proof cases. (These proved much too heavy for practical use, and it is well that they were not needed.)

The first diving operation after the UMBRELLA event required divers to go on the deck of the submerged target submarine at about 30 feet approximately four hours after the event.

a. The water in the area was light-colored and cloudy. Readings as high as 3.0 r (gamma) were obtained with the AN/PDR-50 when the area was first entered about 1½ hours post-shot. (Beta activity was believed to be approximately ten to twenty times the gamma values during the period concerned.) By the time the divers entered the water, readings at 30 feet had dropped to 0.6 or 0.65 r.

b. The divers were dressed in dry-type rubber suits, equipped with full face Scott Hydropak masks, and instructed concerning the hazard of any ingestion of water.

[redacted]

c. The divers were aboard an LCM in the area for about one hour before diving. The dive itself required only closing a few valves to surface the submarine, and within five minutes the divers emerged on the rising deck. They remained there approximately 20 minutes.

d. The dive badges indicated an exposure of approximately 200 mr for the whole procedure. The suits did not leak; and when they were removed, readings on the divers were scarcely above background.

e. Readings were obtained at other depths at this time. A value of 2.2 r was reached at 130 feet, and an abrupt rise to 30 r was noted at 140 feet, on or close to the bottom.

No more diving was done in the target array area until 11 June. At that time, probe readings were obtained in a number of areas where diving would be required. They can be summarized as follows:

a. Water -- no reading above 10 - 15 mr in any area except very close to bottom.

b. Bottom -- distances are from UMBRELLA zero.

2300 ft SW - 1.5 r

1500 ft NE - 3.6 r

1500 ft N - 6.0 r

2000 ft N - 1.7 r

1½ miles E - less than 5 mr

7½ miles NE - less than 5 mr

Brief SCUBA dives requiring little contact with the bottom were permitted in the 3.6 r area on 11 June. Divers found the bottom covered with a 6-8 inch layer of white, powdery material. There was little murkiness of the water, but the bottom material was very readily stirred into clouds that obscured visibility.

Film badges from divers who were on or close to the bottom for approximately three minutes in this area showed no exposure above 12 mr.

Subsequent dives in areas showing significant bottom readings were all made with SCUBA and involved little or no actual contact with the bottom. Film badges showed negligible exposures. Bottom readings obtained in similar areas on successive days indicated rapid decay. More distant areas that were

considered possibly subject to later contamination by currents at depth showed no evidence of such an effect.

During the week following UMBRELLA, few dive badges gave readings as high as 20 mr even from longer dives in radioactive areas. The highest film badge readings came from relatively long dives on the target SQUAW. At the end of the week, the "Divers' Radiological Safety Instruction" was cancelled. Divers continued to wear their regular film badges during dives, but no special measurements or procedures were prescribed.

Altogether, only three or four of the many film badges used underwater showed leakage. In every instance, the case showed evidence of damage due to mechanical blow or severe bending. Wetting with non-radioactive water apparently added approximately 180 mr to the reading because of resulting roughening of the emulsion, not because of darkening of the film. The badges used were properly known as "DuPont Dosimeter Film Packets, Type 559 with rigid acetate cases."

Cumulative dosages were obtained from divers' regular film badges as reported by the standard system. The divers had worn their regular badges as well as special dive badges during dives, but the total-dose figures for divers differed little from those of non-divers whose activities and locations were otherwise similar. The greatest dose indicated for any diver was 2660 mr-well below the limit applied. It is noteworthy that the diver with this total dose was a non-SCUBA qualified member of the diving team and had made few dives at any time and none following UMBRELLA.

The fact that underwater radiation was virtually no problem during Operation HARDTACK does not warrant the conclusion that precautions of the kind applied are not necessary. Other types of tests or other diving requirements might alter the picture radically. Although the "Divers' Radiological Safety Instruction" (enclosure (4) of CTG 7.3 INSTRUCTION 10470.1) went considerably beyond the actual needs of the situation, it can still be considered a sound approach to a problem of unknown magnitude; and it would probably have been adequate for handling a serious problem had one developed.

UNCLASSIFIED

UNCLASSIFIED

[redacted]

DIVING MEDICAL OFFICER

GENERAL

The presence of a Medical Officer trained in diving is mandatory in any operation requiring diving activity approaching the extent, depth, or difficulty of that involved in Operation HARDTACK.

QUALIFICATIONS

All types of diving were conducted during the Operation. (Helium-oxygen diving was not required but was conducted for training purposes by USS CHANTICLEER (ASR-7) while in the area.) SCUBA diving played an exceptionally important role and was employed at unusual depths. Familiarity with all types of diving, and particularly with the special problems of SCUBA, was therefore important for the Diving Medical Officer. As was the case with LCDR LANPHIER, few Medical Officers have had the formal SCUBA training required for "qualification" in the letter of regulations. In his case, exceptionally long experience with SCUBA provided compensation. Although doing actual divers' work is not the Diving Medical Officer's function, CTG 7.3 would be justified in insisting that the Medical Officer assigned have either formal SCUBA qualification or equivalent experience. Acquaintance with nuclear medicine, or at least the type of orientation received in the Weapons Orientation Advanced Course, is also highly desirable.

DATE OF REPORTING

Although earlier reporting of the Diving Medical Officer would have permitted more participation in the planning phase, this was compensated partially by the proximity of his previous duty station. Several of the preliminary tasks for which he was responsible were not fully completed by the time the actual diving operation began. However, most of these tasks should be less time consuming in subsequent operations. If the Diving Medical Officer can be associated with the Staff in the EPG for a full month prior to the beginning of extensive diving, this should be sufficient.

STAFF STATUS

As was appropriate, the Diving Medical Officer served mainly in an advisory capacity under the Mooring and Salvage Officer.

[redacted]

UNCLASSIFIED

a. He was given a virtually free hand and complete cooperation in areas such as the preparation of the diving instructions and its enclosures, maintenance of records, physical examination of divers, and other matters discussed elsewhere. In these areas, he was able to function in an appropriate and effective manner.

b. Invariably he was not, however, consulted in plans and decisions concerning the use of divers. On occasion, these involved health and safety, and sometimes he learned of them barely in time to take required action.

c. His position was especially anomalous and ineffective when he was required to act, without authority or adequate information as an intermediary between project personnel, the Mooring and Salvage Officer, and divers; attempting to schedule work for the Diving Team, and the like. However, when he was given substantial control of the Team and kept better informed (relatively late in the Operation), such activities seemed a logical aspect of his work in spite of their clearly non-medical nature. His thorough acquaintance with Task Group 7.3's diving capability and first-hand knowledge of many of the problems concerned proved very valuable in this connection.

d. Since the Diving Medical Officer is in any event obliged to have extensive knowledge of divers and diving operations, and since adequate attention to diving severely limits his ability to do other types of work, it is reasonable that he be given considerably more than purely medical responsibility for divers and their employment and that he be a party to all plans and decisions in these matters.

PREPARATION OF INSTRUCTIONS

This consumed a large amount of the Diving Medical Officer's time and was a necessary function. However, publication of Part I of the new U.S. Navy Diving Manual will place much of the information in the hands of those concerned by the time of the next Operation. For example, use of the new tables will be universal and will require no special instruction. In the future, CTG 7.3 diving instructions can be confined to matters of special local concern. Special material such as the Diver's Radiological Safety Instructions should be re-useable almost in present form.

PROCUREMENT OF MEDICAL MATERIAL

Preparation of lists and obtaining drugs and instruments also consumed considerable time and was likewise necessary. In the future, if diving ships have complied with the new manual in this matter, the Diving Medical Officer will need to be concerned only with:

a. Supplying himself with a medical bag that is adequately equipped and suitable for use both in a recompression chamber and under rough, wet conditions.

b. Seeing to it that appropriate first aid chests are in the diving boats.

c. Ascertaining that the resuscitators now in Task Group 7.3 possession are in operating condition.

RECORD-KEEPING

During Operation HARDTACK, maintaining the CTG 7.3 Diving Log was a formidable task that could not readily be delegated. The register of divers found numerous applications. The radiological safety data was obviously necessary. The detailed records of dives were required for continuous checking and later analysis of the performance of the new decompression tables as well as to permit keeping track of overall diving activity. However, since the tables proved so satisfactory, collection of detailed diving data would be superfluous in future Operations. A weekly summary of a ship or team's dives would be sufficient; and if this were submitted on a standardized form, the information would not require transcription.

PHYSICAL EXAMINATION OF DIVERS

Physical examination of divers was also a time consuming responsibility.

a. Articles 14-15(3) and 15-30 of the Manual of the Medical Department require that all divers be examined annually in January of each year. It was found that a considerable number of divers assigned to the Operation had not had these examinations. Difficulties of scheduling, transportation, and getting appropriate laboratory work and X-rays made these overdue examinations burdensome for all concerned; but they were accomplished in almost all cases. If all ships assigned to EPG operations would assure that these examinations were performed in advance, a sizeable nuisance would be avoided.

b. Article 14-15(4) of the Manual of the Medical Department also requires at least an initial physical examination of divers at the outset of an exten-

sive diving operation and indicates the desirability of examination before every dive. The latter was obviously out of the question here and is seldom practical anywhere; but initial examination of all divers was attempted. These examinations were not as complete as the divers' annual and did not require laboratory work; but even so, they were not accomplished in every case. Although very few significant defects were found among the many divers who were examined, the value of such an examination is undeniable.

PRESENCE DURING DIVING ACTIVITY

Much of his work could be done effectively only at Headquarters, and as many as four diving jobs were often going on at once in widely separated areas; so the "presence" problem was one that the Diving Medical Officer never solved to his own satisfaction.

a. During HARDTACK, there was little question of the competence of the diving ships or their diving hospital corpsmen. Therefore, being present with the Diving Team and other groups that sometimes operated independently seemed much more important because they had no diving hospital corpsman or chamber and usually worked from small craft at some distance from the diving ships. When this was the case, the Diving Medical Officer generally went along; and on the occasions when he could not do so, the Staff hospital corpsman took his place.

b. The most potentially serious problem was that getting the Diving Medical Officer to a ship promptly in an emergency was sometimes virtually impossible. On one occasion, fortunately not involving a serious emergency, nearly two hours elapsed in transit by boat. With the types of ships concerned, use of a helicopter was not considered very practical. However, it was felt that the Medical Officer could be lowered by sling into the water nearby or into an unobstructed small boat if the circumstances warranted. In all of the situations that actually arose, the Diving Medical Officer was readily located, voice communication by radio was good, and consultation by this means and going to the scene by boat were ample means of handling the situation. However, this might readily not have been the case in a serious emergency, but no better solution was apparent.

c. If the situation is similar in future Operations, having the Diving

[redacted]

Medical Officer based with the Staff will again probably render him most useful generally and reasonably accessible to the most ships. The expected reduction in paperwork should permit him to spend more time afloat. If only one ship were involved in major diving activity, his duties should probably be modified to permit him to remain aboard.

STAFF MEDICAL DUTIES

The division of the Staff caused a number of matters that would normally have been handled by the Staff Medical Officer to fall to the Diving Medical Officer. However, the resulting amount of work was generally small.

CLINICAL MEDICINE

The Diving Medical Officer had no assigned medical responsibilities except in connection with diving. However, he did perform non-diving physical examinations, take care of minor medical problems among the Staff, and assist when needed at the local dispensary, all to a limited extent. He was also frequently consulted about medical problems aboard ship. It appeared evident that with reasonably adequate regular medical facilities available, intervention of a Diving Medical Officer who has no regular place to work and little to work with generally contributes little. With the expected reduction in paperwork, the Diving Medical Officer in a future Operation could probably devote enough time to clinical medicine to make this worthwhile. However, it is doubtful that his diving duties would permit regular assignment to such duty or adherence to a definite schedule.

ASSISTANCE

The Diving Medical Officer received ample assistance from the Staff Hospital Corpsman and the Operations Department Yeoman. He should not require special help in future operations unless his duties are increased. If a diving hospital corpsman can be provided, he should be a regular member of the Diving Team but could assist the Diving Medical Officer when not diving. The Staff hospital corpsman's normal duties do not warrant assignment of a diving corpsman to this position.

[redacted]

SECTION 4

LOGISTICS

4.1 ORGANIZATION AND RESPONSIBILITIES

During the interim and pre-operational planning period, the Logistics Section consisted of the Logistics Officer, Supply Officer and Comptroller, and the Material and Ship Conversion Officer. During the pre-operational period an Assistant Logistics Officer was added to the Staff. Because of the two (2) Atoll concept and the necessity for a divided Staff it was planned that the Assistant Logistics Officer would operate with the Administrative Headquarters in the U.S.S. BOXER (CVS-21) while the major portion of the Logistics Staff would be located at ELMER Island, ENIWETOK. This assignment was carried out during the Operational Period.

4.1.1 LOCATION OF LOGISTICS SECTION

The necessity for the Logistics Section to operate at ENIWETOK was created by the following conditions:

a. All shipments of material via Military Air Transport Service (MATS), Military Sea Transportation Service (MSTS), or Reefer Ship (AF) are unloaded at ENIWETOK; transhipment by C-54, or T-LST for the BIKINI Area must be arranged by the pertinent Task Group.

b. The Logistics Officer as Senior Officer on the Staff under the Chief of Staff was assigned administrative duties at ENIWETOK as the Senior Staff Officer Present in that area.

c. The two underwater shots were scheduled for ENIWETOK and the resultant activity there demanded that the Material Officer remain in the ENIWETOK Area where the Repair Ship (ARG) was located.

d. The Logistics Officer as Senior Staff Officer Present was assigned the responsibility for coordinating preparations for the two (2) underwater shots scheduled for ENIWETOK.

4.1.2 PLANNING

During the pre-operational period the Logistics Section concluded

(4.1.2 Cont'd.)

its detailed planning in the following major areas:

a. Division of responsibility between the Bureau of Ships and Task Group 7.3 in connection with the underwater shots.

b. Transportation of Staff and Units to the ENIWETOK PROVING GROUND.

c. Requirements for boats and craft.

d. Towing arrangements for the Target Array.

e. Towing and lift of Boat Pool craft to the Eniwetok Proving Ground.

f. Modification of assigned Operating Ships.

g. Publication of the Administration and Logistics Operation Order.

h. Budgeting for Travel and Per Diem, Maintenance and Operation, and Administration.

i. Procurement of miscellaneous items for use in diving, communications, mooring, and weather data taking.

j. Replenishment of ships.

k. Logistical support of smaller units.

l. Construction and Services required in the Eniwetok Proving Ground.

m. Operation of the Task Group 7.3 Boat Pool and Boat Pool Detachment.

n. Billeting of personnel ashore in the Eniwetok Proving Ground.

o. Roll-up procedures for Material on Loan.

4.1.3 OPERATING PERIOD

During the Operation, planning was transformed into reality. No emergencies occurred. Mooring material ordered from all portions of the entire United States and even from Europe arrived by Military Sea Transportation Service (MSTS) and Military Air Transport Service (MATS) in time for designed usage. Replenishment of provisions and fuel operated smoothly. Units took their place ashore and afloat as previously scheduled.

4.1.4 FUNCTIONS OF LOGISTICS SECTION

Because of the lack of any Naval Base Command in the Eniwetok Proving Ground, the Logistics Section unavoidably also had to function to some extent as a field activity. Storekeepers and seamen drawn from various Task Group 7.3 Units were assigned to handle all incoming material for Task Group 7.3 Units arriving by MATS, MSTS or Navy Reefer Ships (AF). This material was delivered to ships, maintained in temporary storage, or invoiced and shipped on to destination. The following activities were organized and operated by the Staff Logistics Section:

a. An activity at FRED to meet all MATS Flights in order to receipt for, re-route, or store shipments intended for Task Group 7.3 Units.

b. A similar activity at ELMER to function in the same regard for material arriving by MSTS ships or in the USS KARIN (AF-33) and USS MERAPI (AF-38).

c. A smaller unit acting under SOPA (ADMIN) BIKINI to receipt for and deliver material to Units in the BIKINI Area.

4.1.5 STORAGE

Since the above activities had been planned on previous experience in the Eniwetok Proving Ground all details functioned properly. The Warehouse and Reefer Building on ELMER, and the Warehouse on FRED which had been constructed after REDWING proved vital to these activities.

4.1.6 PERSONNEL

Now that the Operation has been concluded it is evident that the Logistics Section should have been considerably expanded in order to cope in more orderly fashion with the many details of transportation, roll-up and disbursing which arose. The necessity for this expansion is covered in succeeding sections but at least one (1) Assistant Logistics Officer to handle transportation arrangements, a second to supervise roll-up and a Disbursing Clerk, First Class (DK1), for preparing disbursements for shore based personnel and small fleet units are called for in operations involving Underwater Shots.

4.2 SMALL CRAFT

4.2.1 SMALL CRAFT REQUIREMENTS

a. Small Craft requirements were planned on the basis of

[redacted] [redacted]

(4.2.1.a. Cont'd.)

providing:

(1) Ship-shore transportation at BIKINI and ENIWETOK.

(2) Assistance in moving craft and ships at BIKINI.

(3) Small Craft mooring buoys at ENIWETOK-BIKINI.

(4) Replenishment of ships at both ENIWETOK and BIKINI.

(5) Assistance to Holmes and Narver during evacuation periods.

(6) Towing assistance for the Target Array ships.

(7) The small craft support required for laying the Inside Moors for UMBRELLA.

(8) Logistics support and personnel transportation to the Target Array.

4.2.2 PROCUREMENT OF SMALL CRAFT

Small Craft requirements were submitted to CJTF SEVEN for forwarding to the Joint Chiefs of Staff and the Chief of Naval Operations, in December 1956 and were modified as late as July 1957. Prior to CJTF SEVEN ltr of 22 April 1957 the Bureau of Ships initiated procurement action with the Naval Repair Facility, San Diego so that LCMs could be readied in time for the Operation.

4.2.3 TYPES OF SMALL CRAFT REQUIRED

The list of craft required by CTG 7.3 was as follows:

a. At BIKINI.

(1) 2 LCM Pushers.

(2) 1 LCM Salvage Boat with A Frame.

(3) 10 LCM-3 Transportation and Replenishment.

(4) 1 LCM-3 Hydrographic Installation.

(5) 2 LCPR Inherent Boat Pool Transportation.

(6) 1 LCPL Inherent Boat Pool Transportation.

(7) 1 YFNB-20 for spare parts, berthing, messing, dispatching and Administrative Office space for Task Group 7.3 Boat Pool personnel.

b. At ENIWETOK.

(1) 1 LCPL - converted into Barge for CJTF SEVEN.

[redacted] [redacted]

(4.2.3.b. Cont'd.)

(2) 1 LCPL - converted into Barge for CTG 7.3.

(3) 7 LCM-3 - Transportation and Replenishment.

(4) 2 40' ML - For ship-shore transportation and SOPA (ADMIN).

(5) 1 Diving Boat - For shallow water Diving Team.

(6) 1 LCU - For Recreation trips ELMER to DAVID, and Logistic Support.

(7) 2 LCU - For Logistic Support to Target Array.

(8) 10 LCM-3 - For Joint Transportation support to Target Array.

(9) 2 LCM-3 (Pushers) - to move larger ships of Target Array.

(10) 2 YTBs - For movement of the Target Array, Barges, and for assistance in laying moors, both inside and outside.

4.2.4 BOAT POOL OPERATIONS

The above craft were sufficient to accomplish the missions assigned, although there never was sufficient boat transportation in the ENIWETOK Area to satisfy individual ship demands. Insufficiency of transportation was caused by such conditions as:

a. Heavy demands for transportation at very early and very late hours of the day. Most ships operated long hours, and timed return-to-port was impractical to plan.

b. The large number of ships in the ENIWETOK Area without boats or with a boat unsuited for use in the lagoon.

c. The considerable distance involved in boat trips from ships to ELMER, FRED, or DAVID.

d. The tremendous amount of logistic support and project support for underwater shots which Task Group 7.3 rendered to Task Group 7.1 and which involved use of small craft.

By provision of additional crews for each boat more trips could have been conducted at night and on week-ends. At least one and one-half crews per boat is necessary at ENIWETOK, to take care of the long working

(4.2.4 Cont'd)

hours and the many Saturday and Sunday trips needed for church and recreation. At BIKINI where fewer ships were stationed and the only runs were short hauls, the boat transportation was excellent; relief crews were not necessary here because an ample number of boats was available for carrying out a routine schedule.

4.2.5 YTB TUGS

The two (2) YTBs assigned for WAHOO and UMBRELLA were work horses. For future Underwater Events outside of the lagoon, three (3) at a minimum and probably four (4) should be utilized. The YTBs had to be employed for every imaginable type of work such as:

a. Moving target array ships.

b. Holding ATFs into the wind while laying moors.

c. Transporting personnel to Target Array Platforms.

d. Providing a platform for welding operations.

e. Assisting in the mooring of each YC platform.

f. Movement of barges within the lagoon.

4.2.6 RETENTION OF CRAFT FOR FUTURE OPERATIONS

a. In planning for HARDTACK procurement of LCMs commenced 12 months prior to the HARDTACK Operational Phase date of March 15, 1958. LCM-3s used by the Task Group 7.3 Boat Pool were in short supply and considerable funds estimated at about $6,000/LCM were required for activation and overhaul. Similarly about $50,000/LCU was required for activation, overhaul, and fitting out of these larger craft.

b. Conversations carried out with representatives of the Chief of Naval Operations, during the planning of HARDTACK, indicated the desirability of small craft being retained in the Eniwetok Proving Ground by the Atomic Energy Commission, in order to eliminate long lift requirements. This is now being accomplished with assignment of a second AFDL to the Atomic Energy Commission for use in overhaul.

c. As a matter of both good economics and wise planning it is considered that the craft, which the Task Group 7.3 Boat Pool needs for each succeeding Operation, should be retained by the Task Group 7.3 Boat Pool

(4.2.6.c. Cont'd.)

during the Interim Period. Consideration of time involved between the return of the boats to the continental limits of the United States and the need for procurement for the next Operation indicates about 7-9 months. By retention during this period the need for deactivation, reactivation, and overhaul is eliminated; in its stead the Task Group 7.3 Boat Pool Interim Allowance is only increased by a sufficient number of personnel to maintain all boats, overhaul the engines, and ready the craft for the succeeding Operation. A substantial saving is also realized in spare parts and fitting out gear in that the Task Group 7.3 Boat Pool will have on hand sufficient parts, and gear, and equipment to suit the boats previously provided. With LCM-3s becoming in increasingly short supply, action to retain the LCM-3s for Task Group 7.3 Boat Pool functions in the Eniwetok Proving Ground becomes of import, since the larger LCM-6s can not be carried in the same quantity as LCM-3s. Greater stabilization of the Task Group 7.3 Boat Pool will also result in a more permanent group with increased experience, and with greater efficiency than one which experiences major turnover of personnel after each Operation.

4.3 TOWING ARRANGEMENTS FOR TARGET ARRAY AND MISCELLANEOUS CRAFT

4.3.1 PLANNING THE SCHEDULE OF TOWS

a. Towing requirements are submitted to Commander in Chief, U.S. Pacific Fleet for approval. When requirements are approved, direct liaison is authorized with Commander Service Force, U.S. Pacific Fleet for details of scheduling. Close coordination is required with CJTF SEVEN, CTG 7.5, and CTG 7.1 to insure that all Joint Task Force craft are included in the towing schedule and that dates are satisfactory. On the spot coordination with Commander Service Force, U.S. Pacific Fleet is necessary to arrive at a final schedule of tows which meets the operational requirements and avails itself of opportune lift.

b. Submission to Commander Service Force, U.S. Pacific Fleet at least three (3) to six (6) months in advance is required because of the many tows required. Modifications to the schedule can be arranged by message.

4.3.2 TOWING ARRANGEMENTS

a. All tows were accomplished as planned. The USS STATEN

(4.3.2.a. Cont'd.)

ISLAND (AGB-5) towed three (3) DDs through a violent storm and required assistance. One DD flooded the after engine room due to a 3/4" stop plug deterioration. A blank flange on the outside had not been provided by the shipyard. The SQUAW and YFNB-12 also took a considerable beating from the storm. Minor repairs were necessary at the U.S. Naval Shipyard, Pearl Harbor, T.H.

b. In the Eniwetok Proving Ground the barge tows were broken up inside the lagoon by YTBs. The destroyer and SQUAW were retrieved outside but the swells and wind created a considerable problem and some slight damage resulted. The EC-2 and YOS-32, were towed into the lagoon at short scope before retrieving because of the smoother waters inside the lagoon.

4.3.3 RETURN TOWS

a. Return tows were planned using the towing craft assigned to CTG 7.3. If there are too many craft to tow, opportune lift is requested from Commander in Chief, U.S. Pacific Fleet and Commander Service Force, U.S. Pacific Fleet. Craft other than barges require caretakers to remain with the craft until opportune lift is afforded. For HARDTACK, opportune lift was requested for YTB-182 which has been reassigned to U.S. Naval Station, SUBIC.

b. The YFNB-20, in tow by the USS CREE, suffered damage and minor flooding enroute Pearl Harbor. Flooding was due to working of the vessel in heavy seas which caused cracks in hull bottom and resultant additional damage to electrical equipment stowed in #3 hold. After completion of temporary repairs by Naval Shipyard, Pearl, the YFNB-20 was allowed to continue to San Diego. Flooding was again experienced enroute to San Diego from Pearl Harbor, but the YFNB-20 arrived safely.

4.4 LIFT AND MAINTENANCE OF BOAT POOL CRAFT BY LSD TYPE SHIPS

4.4.1 PLANNING

a. In planning the lift of small craft to the Eniwetok Proving Ground advantage was taken of the LSD rotational policy which Commander Amphibious Force, U.S. Pacific Fleet employed for HARDTACK. The two (2) LSDs which arrived in the Eniwetok Proving Ground in early March 1958 carried

(4.4.1.a. Cont'd.)

out the Task Group 7.3 Boat Pool personnel and craft plus three (3) LCUs. A relief LSD in mid-April carried out the Task Group 7.3 Boat Pool Detachment with its 12 LCMs. Other opportune lifts for the many LCUs on loan to Holmes and Narver were planned with Commander Amphibious Force, U.S. Pacific Fleet and advantage was taken of LSDs both going to and returning from WESTPAC. Early planning enabled all boats to be sent to the Eniwetok Proving Ground without undue difficulty. Discussions with Commander Amphibious Force, U.S. Pacific Fleet were held both by telephone and visit in arranging the above lifts.

4.4.2 OPERATION AND MAINTENANCE OF BOAT POOL CRAFT BY LSDS

a. As orginally planned, the Task Group 7.3 Boat Pool operated from the beach at NAN Island. Using this method of operation the boat pool functioned without difficulty. The LSD assigned to BIKINI was utilized for inter-atoll lifts, off-atoll site construction, and later movement of vehicles and cargo to Johnston Island. Although it had not been planned to operate the Task Group 7.3 Boat Pool Detachment at ENIWETOK on the beach, the necessity for the USS MONTICELLO (LSD-35) to be used for Johnston Island transportation, inter-atoll lift, and relief Flagship at BIKINI, soon dictated that this Detachment had to operate ashore at ENIWETOK also. This was accomplished by placing spare parts in the Task Group 7.3 Warehouse at ELMER. Arrangements were made with Holmes and Narver to lift boats onto the beach when hull work was required.

4.5 MOVEMENT TO FORWARD AREA AND ASSEMBLY OF SUBORDINATE UNITS

4.5.1 PLANNING

a. It was realized early in the planning stage that the matter of getting ships and units to the Eniwetok Proving Ground in proper phase presented an intricate problem. The schedule indicated below was finally resolved:

ARRIVAL DATE EPG	UNIT FUNCTION
Mid-JAN 1958	An advance group to supervise and install equipment in the ELMER Communications Center, and to commence operations prior mid-March.
Late-JAN 1958	First Echelon of Marines and Helos to furnish Air Transportation for BIKINI.

[redacted] RE[redacted]

(4.5.1.a. Cont'd.)

Early-FEB 1958	USS MOCTOBI (ATF-105) - To assemble mooring equipment and lay Inside Moors.
Early-FEB 1958	Lift of two (2) YTBs, three (3) LCUs and personnel to assist in laying moors at ENIWETOK. Two (2) Storekeepers to assist in locating and issuing equipment.
Late-FEB 1958	Lift of Task Group 7.3 Boat Pool personnel and craft to BIKINI and ENIWETOK for furnishing boat transportation.
Early-MAR 1958	USS BOXER (CVS-21) and Task Group 7.3 Staff contingent to direct and coordinate Task Group 7.3 matters in the Eniwetok Proving Ground.
Mid-MAR 1958	Remainder Task Group 7.3 Staff - Records Flight - 183 boxes - 7740 lbs - 312 cu. ft.
Mid-APR 1958	Arrival Target Array Units and Task Group 7.3 Boat Pool Detachment.

4.5.2 OPERATIONS

a. The schedule as set forth above turned out to be most practical. The WAHOO and UMBRELLA ready dates were met within a day of the planned schedule. The USS MOCTOBI (ATF-105), which arrived early in February to assemble and lay the inside moors, was not able to fully utilize its time because of difficulties in locating the mooring equipment and coordinating necessary assembly of equipment ashore. However, all inside moors were assembled and placed inside the lagoon in approximate position. Shifting these moors to the exact positions required for UMBRELLA was quite easily accomplished because of the use of crown buoys over each anchor.

b. In late April the last of the Task Group 7.3 units arrived in the USS MONTICELLO (LSD-35) and USS RENVILLE (APA-227). Both the Task Group 7.3 Boat Pool Detachment and Task Group 7.3 Decontamination Unit had been held until last because their missions were directly concerned with WAHOO and UMBRELLA. The small boat transportation to be furnished by the Task Group 7.3 Boat Pool Detachment was none to early. With the many operating ships, plus Target Array ships and craft, many more boats would have been welcome at least two (2) weeks earlier. Recreation trips had suffered because of the use of boats for required services.

4.6 CONSTRUCTION AND SERVICES IN THE EPG

4.6.1 CONSTRUCTIONS

[redacted]

(4.6.1 Cont'd.)

a. Construction in the Eniwetok Proving Ground may be divided into two (2) classes: First, that which is part of the long range construction program submitted by CJTF SEVEN via the Atomic Energy Commission or Army Channels for approval by Congress and, Second, that construction of less than $25,000 which can be authorized under Operation and Maintenance Funds.

b. Each Task Group is represented at the Construction Conference held at CJTF SEVEN Headquarters and submits its construction requirements at that time. Task Group 7.3 has only minor construction requirements relative to the other Task Groups; however, each item is essential for future Operations and the conditions and size of these buildings must be known in order to properly plan for future operational requirements.

c. During HARDTACK, Task Group 7.3 occupied the following buildings:

BUILDINGS	FUNCTIONS
Four Office spaces ELMER, Building 221.	Staff and SOPA (ADMIN) Headquarters.
One Office space, ELMER, Building 221.	Office CTG 7.3
Communication Center, Building 221.	Task Group 7.3 Communications.
Warehouse and Reefer Building, ELMER	In transit storage of Task Group 7.3 provisions and supplies. Boat Dispatcher.
Warehouse Building, FRED	In transit storage of Task Group 7.3 supplies.
Camps PARSONS, DAVID ENIWETOK	Recreation.
Camp BLANDY, NAN, BIKINI	Recreation.
SOPA (ADMIN) Building, NAN, BIKINI	Administration and Task Group 7.3 Boat Pool functions.
Hangar, Office Space, Base Radio and Tents, NAN	Marine Helicopter and UF-1 Operations.
VP-28 Buildings - KWAJALEIN	Squadron Operations and Maintenance.
Barracks and Tents, ELMER and NAN	Billeting of Personnel.

d. CTG 7.3 letter serial 1283 of 31 May 1958 submitted to CJTF SEVEN requirements for maintenance of the above buildings during the

[redacted]

[redacted]

(4.6.1.d. Cont'd.)

Interim Period. The letter also stated requirements for minor installations which would be necessitated by future Operations and which fall into the operating fund category. Such minor requirements should be restated to CJTF SEVEN prior to the next operating period.

e. At the Construction Conference held by CJTF SEVEN during HARDTACK, CTG 7.3 submitted two (2) items for the Fiscal Year 1960 long range construction program. One item is for construction and equipping of a Command Post at the ELMER Headquarters, and the second is for necessary constructions required for support of a VP Squadron at Kwajalein. Investigation is now being made by CJTF SEVEN regarding the feasibility of operating the VP Squadron from FRED in lieu of Kwajalein.

4.6.2 SERVICES

a. Services for operating ships in the Eniwetok Proving Ground are almost non-existent. Diesel oil for smaller units can be obtained by prior agreement with the AEC from the Deep Water Pier at ELMER. Water supply will only be furnished in an emergency due to the limited supply. The YOS-32 moored at ENIWETOK can furnish NSFO, and arrangements have been made for its retention in the Eniwetok Proving Ground during the Interim Period. By prior arrangement with Commander U.S. Army Task Group 7.2 certain provisions or supplies can be ordered if sufficient advance notice is given.

b. For personnel ashore in the Eniwetok Proving Ground living accomodations, messing, and laundry facilities are available.

4.7 POL ASHORE AND AFLOAT IN THE EPG

4.7.1 POL AFLOAT

During REDWING CTG 7.3 was furnished an AO for operating ships about 4½ weeks out of each six (6) weeks. During HARDTACK an AO was furnished on a continuing basis and the services of the AO were lost for 3 weeks during the periods that it was sent to Pearl, to replenish and return. While the AO was absent, fuel oil was supplied to various units by YOS-32 which was moored at ENIWETOK, or by the USS BOXER (CVS-21) at BIKINI.

4.7.2 REQUIREMENTS

The number of ships which comprise Task Group 7.3, and in addition

[redacted]

(4.7.2 Cont'd.)

the division of Task Group 7.3 ships between BIKINI and ENIWETOK requires the use of an AO for replenishment at least once monthly over about a ten (10) day period. For the remainder of the month the DDs can refuel from a larger unit or the YOS-32; the diesel powered units and larger ships have sufficient fuel for at least six (6) weeks.

4.7.3 AVGAS

The loading of the AO with 10M bbls of Aviation Gas (115/145), 14M bbls of Diesel, and 74M bbls of NSFO provides a satisfactory balance. Although Aviation Gas was only furnished to the USS BOXER (CVS-21) or the POL Barge at BIKINI, the Aviation Gas is also available as an emergency back-up for the Aviation Gas supply at FRED. In the event of such a need, the Aviation Gas must first be transferred to an AOG which in turn can replenish the POL farm. The proximity of the POL buoys closeness to the reef at ENIWETOK prevents an AO from mooring near the POL Farm.

4.7.4 POL ASHORE

The Point to Point POL supply ashore at FRED, ELMER, and BIKINI is coordinated by CTG 7.4 with Commander Sub Area Petroleum Office, Hawaii. Five (5) AOGs furnish routine resupply of Jet Fuel, Aviation Gas, Diesel Oil and Mobile Gas for shore based units.

4.8 EVACUATION

4.8.1 PRE-SHOT EVACUATION

a. Complete Pre-Shot Evacuation for all personnel at BIKINI was only required for two (2) events. For the SYCAMORE Event the USS BOXER (CVS-21) and USNS FRED C. AINSWORTH (T-AP-181) combined to evacuate about 1200 personnel. For the later POPLAR Event the USS MONTICELLO (LSD-35) and USNS FRED C. AINSWORTH (T-AP-181) combined to evacuate about 1050 personnel. Helicopters were evacuated in BOXER (SYCAMORE) and MONTICELLO (POPLAR). YFNB-20 and helo landing barge were towed to sea by ATF. Each evacuation was carried on without incident. Prior to some events, partial evacuation was required for certain personnel who were normally billeted on the island which had been designated hazardous for particular shots. These persons were evacuated to the AINSWORTH.

[redacted]

(4.8.1 Cont'd.)

b. At ENIWETOK for the OAK Event it was found necessary to evacuate all light aircraft and helicopters from FRED. This was accomplished by flying helicopters onto the USS BOXER (CVS-21) prior to dark on D-1. All light aircraft, L19s and L20s escorted by an SAE-16 aircraft orbited over the USS BOXER (CVS-21) at a safe distance (35 miles) from ENIWETOK from H-1 hour until the shock wave had passed. The time of the event was such that orbiting was accomplished during daylight hours.

c. At ENIWETOK a water wave of some consequence occurred at ELMER during the OAK Event. Water covered the personnel pier, ELMER and then receded leaving the entire swimming area at ELMER dry before the wave returned. Small boats secured to the mooring buoys in close to shore were affected. CJTF SEVEN Barge and one (1) Motor Launch suffered slight damage to the hulls in scraping the bottom when the water receded. Prior to this event all ships had been placed at anchorages and small craft removed from alongside of larger units.

4.8.2 EMERGENCY EVACUATION

a. The possibility of emergency evacuation of either ENIWETOK or BIKINI Atolls exists after an event occurs at either Atoll although it is quite unlikely that BIKINI would be affected by an event at ENIWETOK.

b. For the above reasons, Commander Task Group 7.3 is charged with the responsibility of maintaining an evacuation capability at both Atolls in addition to being prepared to evacuate natives at off-atoll sites if the emergency occurs.

c. The population of BIKINI (about 1200 maximum) is such that any one large ship in that vicinity can provide the emergency evacuation capability. At ENIWETOK Atoll, however, the population at FRED reached a maximum of about 3200 and at ELMER about 2700. In this area at least two (2) large ships are required for Emergency Evacuation.

d. When the TEAK and ORANGE Events were rescheduled for Johnston Island, it became necessary to assign both the USS BOXER (CVS-21) and an LSD for NEWSREEL Operations.

e. CTG 7.5 also required both T-LSTs for operations removed

[redacted]

(4.8.1.e. Cont'd.)

from the Eniwetok Proving Ground. The departure of all of these ships from the Eniwetok Proving Ground created the problem of how to best maintain the emergency evacuation capability at ENIWETOK. It was accomplished by very tight scheduling of available ships and use of opportune MSTS ships.

4.9 SHIP MODIFICATIONS

To fulfill specific requirements, certain HARDTACK assigned ships received special installations. A brief resume follows (Installation in support of NEWSREEL are contained in Section 8):

4.9.1 USS BOXER (CVS-21)

BOXER was designated to act as Flagship for CTG 7.3; to provide communication services for embarked staffs; to lift and service Marine Helicopter Transport Squadron (Light) 361 (HMR(L)-361) helicopters; to provide a launching platform for the YUCCA balloon shot, including launching, firing and telemetering installations; to conduct pre-shot and emergency evacuation of BIKINI; to provide an Air Operations Center in Combat Information Center (CIC) for Task Group 7.4 Air Controllers; to lift devices from the continental limits of the United States to the Eniwetok Proving Ground; and to carry certain van mounted instrument stations for project participation by Task Group 7.1. To carry out these missions, the following installations were made by the Long Beach Naval Shipyard during the period 28 October 1957 to 7 January 1958:

a. Timing and Firing equipments, including Zero Rack, transmitters, antennas and cabling, installed in Flight Deck Crew's Shelter, B-0301-L.

b. Special Communication installations (See Section 5).

c. Installation of three (3) status boards in Flag Plot.

d. Installation of interim water washdown system.

e. Improvements to Flag Cabin spaces.

f. Installation of one (1) RD-115 recorder in Air Operations.

g. Conducted 45,000 pound dynamic test on boat crane for handling vans and trailers.

h. Extend air conditioning ductwork to wardroom staterooms

[redacted]

(4.9.1.h. Cont'd.)

245 and 247.

i. Manufacture of strongbacks for lifting vans and trucks.

j. Modification of the following spaces for office

(1) Ready Room #1.

(2) Ready Room #3.

(3) Starboard Squadron Office.

(4) Port Squadron Office.

4.9.2 NAVAL SHIPYARD WORK

Close liaison with the Long Beach Naval Shipyard was maintained during the installation period, in order to reduce to a minimum the effects of unavoidable delays in delivery of equipments, which were to be received from many different sources. Because of these delays, and because of the late date at which the BOXER was assigned to support the operation, the installation was completed on 6 January 1958 rather than on 20 December 1957 as originally scheduled.

4.9.3 TWIN SIDEBAND INSTALLATION

A Collins Radio Company representative was contracted to assist in the Twin Sideband installation and to ride the ship during HARDTACK in order to assist ships force in operating and maintaining the equipment. This arrangement was very satisfactory.

4.9.4 SERVICE ENGINEERS

Two (2) Philco Company engineers (1 communication equipment expert and 1 radar engineer) made courtesy calls 26 April - 4 May 1958 in the BIKINI Area and while aboard the USS BOXER (CVS-21) were very helpful in accomplishing repair work and in advising ship's force.

4.9.5 EVACUATION SHIP MODIFICATIONS

USNS FRED C. AINSWORTH (T-AP-181) was designated to serve as pre-shot and emergency evacuation ship for Task Group 7.1 and Task Group 7.5 at BIKINI. To carry out these functions, certain communications installations and office space re-arrangements were required. This work was performed in San Francisco under the direction of Commander Sea Transportation Service, Pacific Area, Fort Mason, San Francisco during the period 10-20 January 1958,

(4.9.5 Cont'd.)

as outlined below:

a. Special communications installations (See Section 5).

b. Install office furniture in certain spaces to be used as offices.

c. Remove bunks from sick bay spaces to make office space.

4.9.6. AUTOMATIC TELEPHONE SYSTEM INSTALLATION

The telephone system referred to in sub-paragraph 5.2.2.2.a (Section 5 Communications) was purchased by CJTF SEVEN and installed in USNS FRED C. AINSWORTH (T-AP-181) for Operation REDWING. During roll-up after REDWING this system was removed and stored. The power supply was returned to Navy Stock and had to be re-procured for HARDTACK. Arrangements then were made to retain this system on board the USNS FRED C. AINSWORTH (T-AP-181) (in storage) during the Interim Period to prevent any other items from going astray.

4.9.7 FUTURE TELEPHONE SYSTEM

When the above telephone system is re-installed, it is recommended that one instrument be installed in the Pilot House and one instrument be installed in the Master's Cabin to permit him to use this facility.

4.9.8 WATER WASHDOWN SYSTEM

Interim water washdown had been installed in USNS FRED C. AINSWORTH (T-AP-181) for REDWING, and was satisfactorily tested prior to deployment for HARDTACK.

4.9.9 GANGWAY

The gangway manufactured for REDWING was overhauled and restored to service for HARDTACK.

4.9.10 GANGWAY FLOAT

The gangway float obtained for REDWING had been stored in the Eniwetok Proving Ground and was ready for use upon the USNS FRED C. AINSWORTH (T-AP-181) arrival. It proved advantageous.

4.9.11 INSTALLATIONS ON USS MUNSEE (ATF-107)

USS MUNSEE (ATF-107) was designated to moor, tend and recover instrument coracles for Project 2.3. In order to perform this function, the

(4.9.11 Cont'd.)

following installations were made by a tender at the U.S. Naval Station, San Diego during the period 14 December 1957 to 6 January 1958.

a. Installation of Markey Hydrographic Winch and Controller on the boat deck, starboard side, aft, in a former 40MM mount location. Installed foundation and power cabling.

b. Installation of working davit at outboard edge of main deck.

c. Installation of Kahl Metering Sheave on working davit.

d. Fabricate and install over-the-side platform to work under davit.

e. Installation of AN/UQN-1B Fathometer to accurately find depth and hear the ball-crusher take the bottom.

f. Interim water washdown was installed by ship's force during this same period. All installations were accomplished in time and without difficulty.

4.9.12. INSTALLATIONS ON USS FLOYD B. PARKS (DD-884)

USS FLOYD B. PARKS (DD-884) was designated to receive a modification to the Gun Fire Control System to permit tracking of long range targets using the computer. Comparative tests of the modified system against hand plotting with the unmodified system were made. The modification is the upper air wind tracking Ordnance Alteration for the MK-1A computer. It consists of installing in the plotting room, a specially modified synchro amplifier in the tracking range circuit to divide this quantity by three, so that it will be of a value which the computer will accept. Installation was done by the U.S. Naval Repair Facility, San Diego during the period 16 December 1957 to 3 January 1958.

The LOKI Dart Rockets were modified to fire from the barrel of a 5"/38 gun, using a modified empty cartridge case for firing circuits. This did away with the requirement for an external launcher attached to the gun barrel.

4.9.13 INSTALLATION ON LSDS

USS BELLE GROVE (LSD-2) and USS TORTUGA (LSD-26) had helicopter decks removed to permit overhead clearance necessary to transport shot barges

(4.9.13 Cont'd.)

between ENIWETOK and BIKINI. In addition, these ships received Ship Alteration LSD 348 (Diesel Oil Purifier and Ready Service Tanks) to insure capability of delivery of purified diesel oil to units of the Task Group 7.3 Boat Pool.

4.9.14 INSTALLATIONS ON APAS

USS RENVILLE (APA-227), USS MAGOFFIN (APA-199) and USS NAVARRO (APA-215) received Ship Alteration APA 803 (Personnel Decontamination Station), and Ship Alteration APA 895 (Interim Water Washdown). Since these ships were designated to carry the Decontamination Unit which would clean up target units following WAHOO and UMBRELLA, it was essential that all facilities for their use be intalled and loaded aboard.

4.9.15 INTERIM WATER WASHDOWN

Interim Water Washdown was installed in all active ships participating in HARDTACK. The Bureau of Ships procured kits for installation by ship's force, and assigned two (2) Engineers to visit each ship, assist in the layout, and expedite material delivery to ships. All installations were made without difficulty, and after a trial operation, all equipments worked satisfactorily, giving adequate coverage.

4.9.16 GAS TURBINE DRIVEN PUMPS

Solar Gas Turbine-driven pumps were installed on board the following target units for water washdown:

a. Ex-DD-474 - four (4) pumps.

b. Ex-DD-592 - four (4) pumps.

c. Ex-DD-593 - four (4) pumps.

d. EC-2 - four (4) pumps.

e. YFNB-12 - two (2) pumps.

f. 8 YC and BC Barges - eight (8) pumps.

Following the initial test of the pumps installed in EC-2 in Long Beach, the salt water ends were not flushed out with fresh water. As a result, salt corrosion of the cast aluminum pump housing, impeller and wearing rings occurred, freezing up the pump. Since no tools or spare parts were provided, it was impossible to overhaul the damaged pumps. Accordingly, a request for assistance brought out an Engineer from Solar Aircraft Company

(4.9.16 Cont'd.)

completely equipped with tools and spare parts. He was able to remedy the difficulty, and remained to train all operating personnel in the technique of care and maintenance of the Solar Units.

4.9.17 BOAT POOL RADIO EQUIPMENT

Boat Pool Radio Equipment AN/SRC-15 was installed in each participating unit. This increased communications flexibility to a degree, in that an additional channel was available for emergency use, as well as for coordination of boating.

4.9.18 INSTALLATION OF "A" FRAME ON USS GRASP (ARS-24)

USS GRASP (ARS-24) was outfitted for handling the WAHOO and UMBRELLA device, for lowering the weapon beneath the shot buoy, and for handling the firing cable. An A-Frame, extending over the fantail and for a short distance over the stern, with a working platform over the stern, was built by the Pearl Harbor Naval Shipyard for use during the feasibility tests conducted off Oahu, T.H. in December 1957. This A-Frame was then transported to the Eniwetok Proving Ground for use during the underwater shots. It was stored ashore until needed on board. It was removed between shots, and re-installed for the second event.

4.9.19 INSTALLATIONS ON BARGES

Six YC and two BCs were used for mooring buoys for the WAHOO shot. Each of these barges received a gasoline driven winch, Berger Fairleads for each mooring wire, water washdown system, and a fuel supply for the Solar Gas Turbine Pump.

4.9.20 YOS-32

YOS-32 (ex-YON-182) had her diesel driven cargo pumps and Chrysler fire pump activated by the U.S. Naval Station, Kwajalein. In addition, Kwajalein prepared the craft for tow, including the installation of running lights.

4.10 SHIP MOVEMENT OF DEVICES AND COMPONENTS TO EPG

4.10.1 BOXER

The USS BOXER (CVS-21) was designated to lift certain devices and components to the Eniwetok Proving Ground which were to be used in the

(4.10.1 Cont'd.)

Department of Defense Events.

4.10.2 LOADING

Loading was effected at the U.S. Naval Air Station, North Island. All items arrived by rail and custody was transferred from the AEC to the Commanding Officer, USS BOXER (CVS-21) at pier side. Security for the shipment and loading operation was handled by Commandant ELEVENTH Naval District. Normal safety precautions in handling these components were controlled by the Ordnance Officer, U.S. Naval Air Station, North Island. A special Weapons Unit, consisting of 1 officer and 9 men, was assigned to monitor and control the materials in transit to the EPG. Shipboard security was provided by the Marine Detachment, USS BOXER (CVS-21).

4.11 SERVICES IN THE ENIWETOK PROVING GROUND

4.11.1 SHIP'S FORCE WORK

a. Throughout the Operational Period, all ships were expected to be completely self supporting as much as possible. This meant that every job which developed was primarily a ship's force responsibility. A complicating feature was the extremely busy operating schedule for the greater number of ships participating. Of particular note were:

(1) The ATF-ARS type ships which were fully employed with preparations for the underwater shots.

(2) The DDs employed continuously on weather station and lifeguard station duties.

(3) The LSDs employed for off-atoll support, inter-atoll barge and LCU lift, and support of Johnston Island. This was in addition to the normal support of USS MONTICELLO (LSD-35) provided to the Task Group 7.3 Boat Pool Detachment.

b. Routine maintenance was on a catch-as-catch-can basis. It was impossible to grant ships even an at-anchor period for maintenance, in the face of current operational requirements until after completion of the underwater shots, at which time a modest upkeep availability program was iniated by very tight scheduling. An alleviating factor in the maintenance situation was the rotational policy applied to DDs, APAs and LSDs. Compounding the heavy work load was the requirement that, on shot days, all ships were

[redacted]

(4.11.1.b. Cont'd.)

required to be on 15 minutes notice for getting underway, in case need for emergency evacuation arose. Of course, this prevented major disassembly of machinery for maintenance. This set of circumstances forces ships of the Task Group to retreat from a program of full preventive maintenance to one of general preventative maintenance and casualty restoration. The Task Group was extremely fortunate to have the services of USS HOOPER ISLAND (ARG-17) available which, time and again, averted what otherwise would have been a real crisis by timely and effective repair assistance. When USS PERKINS (DDR-877) arrived at ENIWETOK, she brought with her an 18 inch crack in her hull plating beneath #3 Boiler suffered during heavy weather enroute to the Eniwetok Proving Ground. This was temporarily repaired by ship's force by welding and shoring. However, the crack was beside an existing plate weld, and appeared to be lengthening at the time of inspection. Accordingly, the USS PERKINS (DDR-877) was sailed to Guam where the ship was drydocked and permanent repairs effected.

4.11.2 REPAIR ASSISTANCE

Assistance from other ships or Boat Pool was freely given, time after time. Of particular note were the services of divers, from ships so equipped, to perform underwater inspections and emergency underwater repairs. Another outstanding example of this willingness to help was the occasion of the Boat Pool repair team which assisted the USS TORTUGA (LSD-26) to make emergency hull repairs following her grounding on UTERIK reef. This grounding ripped out about 45 feet of USS TORTUGA (LSD-26) bottom, and flooded her two forward tanks. USS TORTUGA (LSD-26) repair personnel, assisted by the Boat Pool repair team, strengthened the remaining structure in Tank A-402-W and installed extensive shoring and truss work in five other compartments which were weakened by the damage to the ship's structure. Again on this job, divers made important contributions to the final strengthening. USS TORTUGA (LSD-26) was able to continue her support mission in the Eniwetok Proving Ground, and upon completion of her assignment to Operation HARDTACK, was able to steam to Pearl Harbor for permanent repairs.

[redacted]

4.11.3 ELECTRONIC REPAIRS

In the field of electronic repairs, major ships frequently helped out smaller units with ET assistance, and spare parts if available. Electrical and Machinery Repair parts were exchanged as needed by ships of the Task Group.

4.11.4 ASSISTANCE BY HOLMES AND NARVER

Support by Holmes and Narver was arranged in advance of the Operation, through funds provided by the Bureau of Ships. These funds were applicable to target units, active ships and the Task Group 7.3 Boat Pool. This support proved very valuable, and in many cases, it was the only way of solving a maintenance problem. Most work was accomplished on a ship-to-shop basis. However, there were some notable exceptions to this. Among these were:

a. USS GRASP (ARS-24) suffered a casualty to her evaporator, and continued efforts by ship's force proved fruitless. In response to a job order, Holmes and Narver distillation plant sent men to assist the ship in restoring the equipment to service. The repair was not quick and easy, and required many days of continued work by ship's personnel. However, the work of Holmes and Narver personnel was an important contribution and was appreciated.

b. USS GRASP (ARS-24) suffered a series of casualties to the Cooper Bessemer FS-6 diesels driving ship service generators. After extensive repairs by ship's force, USS GRASP (ARS-24) requested assistance from the Holmes and Narver Diesel Shop to verify final alignment readings obtained after reassembly. This service was promptly furnished.

c. In several instances Holmes and Narver furnished portable skid-mounted generators for the EC-2 to provide power, following damage to the ship's generators in WAHOO.

d. Rigging and crane service afloat was provided by motor crane in a LCU on a number of occasions. This capability was used in repairs to the diesel and the cargo pump in the YOS-32.

e. In response to a request for shore marks to enable the USS MOCTOBI (ATF-105) to plant the UMBRELLA moorings, Holmes and Narver moved three (3) Bilby towers from NAN Island at BIKINI to GLENN, HENRY AND KEITH

[redacted] [redacted]

(4.11.4.e. Cont'd.)

at ENIWETOK. On several occasions, and on very short notice, Holmes and Narver draped and re-draped these towers with high visibility bunting to facilitate positioning of ships and moorings both in the WAHOO and UMBRELLA array.

4.11.5 PHILCO FIELD ENGINEERS

Support by Field Engineer Services was uniformly excellent. Two (2) Philco Electronics Field Engineers were obtained on contract by the Bureau of Ships, and were administered by the USS HOOPER ISLAND (ARG-17). These men were able to serve electronics installations at both ENIWETOK and at BIKINI. Their services were extremely valuable, both in restoring casualties and in conducting on-the-job training for shipboard ET's. In preparation for Operation NEWSREEL at Johnston Island, an additional two (2) Engineers were made available by the Bureau of Ships to work at that location.

4.11.6 ASSISTANCE FROM COLLINS RADIO CORP

One (1) Collins Radio Corporation Engineer was obtained by CJTF SEVEN for services on board the USS BOXER (CVS-21) to assist with installation, operation and maintenance of the Twin Sideband Collins Radio Transmitters, associated receivers and terminal equipment installed. A second Collins Engineer was contracted to serve the FRED terminal of the Sideband Link. This engineer not only successfully maintained the Sideband circuit in continuous operation, but also rendered valuable assistance to the USS BOXER (CVS-21) electronics personnel at other times.

4.11.7 ASSISTANCE FROM SOLAR AIRCRAFT COMPANY

Solar Aircraft Company representatives arrived in the Eniwetok Proving Ground to assist with the maintenance of gas turbine-driven water washdown systems, as earlier outlined in Paragraphs 4.9.16.

4.11.8 SHIP PROTECTION ENGINEERS

Two (2) Ship Protection Marine Engineers from the Bureau of Ships participated both in the Planning and Operational Phase for the purpose of installing and operating water washdown systems. Their contribution was very valuable.

[redacted] [redacted]

[redacted]

4.11.9 REPAIR SHIP ASSISTANCE

The USS HOOPER ISLAND (ARG-17) was assigned to Operation HARDTACK, and began serving Task Group ships even before arriving in the EPG. The USS HOOPER ISLAND (ARG-17) accompanied the USS STATEN ISLAND (AGB-5), which was towing three (3) Target DDs from Pearl Harbor to Eniwetok, and accepted ship-to-shop work by high line enroute. Upon arrival in ENIWETOK, USS HOOPER ISLAND (ARG-17) took the three (3) Target DDs alongside, and gave them electricity and other services to help them prepare for participation in WAHOO and UMBRELLA. All other Task Group 7.3 ships submitted work to the USS HOOPER ISLAND (ARG-17) on a ship-to-shop basis. When requested, USS HOOPER ISLAND (ARG-17) sent Repair Department personnel to undertake work on board other ships and craft. Short alongside availabilities were scheduled for the USS BELLE GROVE (LSD-2) and (6) ATF-ARS types. There was scant opportunity to make full use of alongside availabilities. However, during her stay, the USS HOOPER ISLAND (ARG-17) completed a total of 752 jobs for 46 ships or other activities. The USS HOOPER ISLAND (ARG-17) contribution to the continued material readiness of the Task Group was extremely valuable.

4.12 COST REPORTING

A requirement for gathering all costs of an Operation in the Eniwetok Proving Ground was established by paragraph E of the "Agreement between the Atomic Energy Commission and the Department of Defense, on costs and responsibilities for Operations at Pacific Proving Ground" dated 1 July 1955. The responsibilities of gathering these costs were further set forth in CJTF SEVEN Standing Operation Procedure No. 172-603 of 9 August 1957. CTG 7.3 was assigned the mission of collecting and reporting all support costs incurred by Navy participation in Operation HARDTACK with the exception of scientific costs, which were the responsibility of the Armed Forces Special Weapons Project to secure. Standing Operating Procedure No. 172-603 also established a system for collecting and reporting costs incurred by the different departments. This system was initiated for all Navy Department Command and Units by Commander Task Group 7.3 letter FF3/7.3/45:vb L1 Serial 286 of 29 August 1957 to the Comptroller of the Navy and the cost reporting system implemented by NAVCOMPT INSTRUCTION 7030.8 of 25 October 1957 and

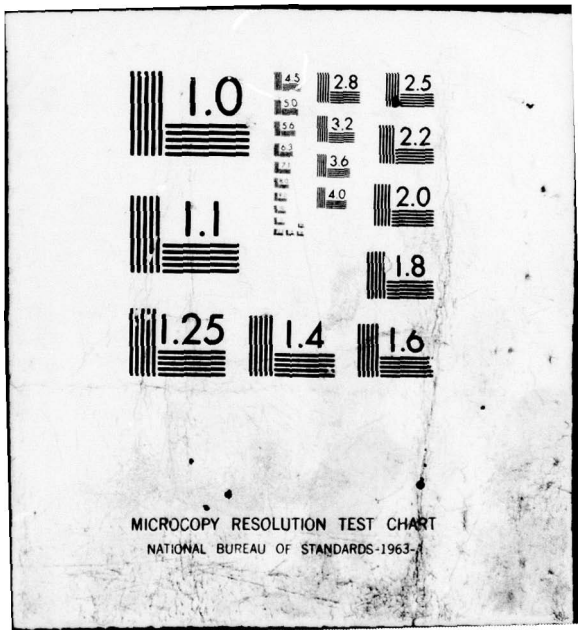
[redacted]

AD-A078 572 TASK GROUP 7.3 FPO SAN FRANCISCO 96333 F/G 18/3
OPERATION HARDTACK, ENIWETOK PROVING GROUND, MARCH-AUGUST 1958.(U)
1958

UNCLASSIFIED AEC-WT-1155 NL

3 OF 3
AD
AD78572

END
DATE FILMED
1 → 80
DDC


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

(4.12 Cont'd.)

NAVCOMPT INSTRUCTION 7030, of 5 December 1957. The Comptroller of the Navy also furnished statistical cost factors for selected vessels and aircraft to CTG 7.3. These factors were used to compute the costs of operating ships under the operational control of Task Group 7.3. Tables of costs for Operation HARDTACK incurred by the Navy Department, as reported through 30 June 1958, are included as Table V to this section of the report.

4.13 BUDGETING CONCEPT

Since CTG 7.3 is a component command of CJTF SEVEN it follows that administrative expenses of CTG 7.3, and expenses of carrying out specific missions assigned to CTG 7.3 are provided for by CJTF SEVEN. (While the above statement is essentially true, because of the number of agencies involved, the funding concepts for Joint Task Force SEVEN are relatively complicated as is indicated in the funding section below and there is no single rule applicable).

4.14 SOURCE OF FUNDS

The Army has been made the Department of Defense Agency responsible for budgeting funds for CJTF SEVEN at its component commands. Therefore, the CTG 7.3 organization is presently funded for from the Appropriation Maintenance and Operating Army. (See CJTF SEVEN pamphlet and booklet "Funding Concepts - Joint Task Force SEVEN" of 1 December 1956.)

4.15 BUDGET SUBMITTALS

Based on past experience, and on as many factors as can be determined regarding future plans, CTG 7.3 compiles a budget and forwards it on request to CJTF SEVEN for review and consolidation with other Task Group submittals. This is in turn passed to Armed Forces Special Weapons Project, then to the Department of the Army, and thereon through the normal budgetary steps through the Department of Defense, Bureau of Budget and finally to Congress.

4.16 BUDGET PROCEDURE

Budgets are always planned, prepared and submitted within the last quarter of a Fiscal Year at or on a date specified by CJTF SEVEN. There are two phases of submitting a budget. The first phase is a planned estimate of the Fiscal Year following the next Fiscal Year. This gives CJTF SEVEN

[redacted]

(4.16 Cont'd.)

a chance to prepare its budget and submit it for approval. The second phase is a firm budget submitted to CJTF SEVEN for approval for the next Fiscal Year. CJTF SEVEN, upon receipt of the firm budget, reviews it and issues Advise of Allotments for the Funds granted. Funds are provided on a quarterly basis.

4.17 ALLOTMENTS RECEIVED

The following paragraphs list allotments of funds received from CJTF SEVEN for Fiscal Year 1958 under Maintenance and Operation Army, and give a brief resume of types of expenses covered.

4.17.1 TRAVEL OF PERSONNEL (FY 1958 OBLIGATIONS $462,238.00)

2182020 M&O Army 821-3100 P2763 S88-021. This was by far the largest of all projects from CJTF SEVEN funds. There have been approximately 1,000 sets of orders and 300 TR's cut against this project. This project funds for all travel and per diem (except for Military Air Transport Service outside the continental limits of the United States), for Task Group 7.3 Staff, Task Group 7.3 Boat Pool, Boat Pool Detachment, Decontamination Unit, Special Projects Unit and Marine Helicopter Transport Squadron (Light) 361. Authority was also granted to Commander Naval Air Force, U.S. Pacific Fleet to cover per diem costs of UF pilots and crews. The large number of Naval Personnel required for "WAHOO" and "UMBRELLA", and their deployment changes, made a constant job of keeping various orders separated for per diem obligations purposes. This project was very closely and effectively figured and funded for prior to leaving the continental limits of the United States. Considerable travel money was saved by transporting some of the larger units to and from the EPG via Navy ships.

4.17.2 TRANSPORTATION OF THINGS (FY 1958 OBLIGATIONS $500.00)

2182020 M&O Army 821-3200 P2763-03 S88-021 is used for shipments of material required by the Task Group where there are no Government Facilities for shipping. Also used for shipping personal effects of all Staff personnel while on temporary additional duty orders under M&O funds as authorized by the Bureau of Supplies and Accounts Manual and Navy Travel Instructions.

[redacted]

4.17.3 COMMUNICATIONS (FY 1958 OBLIGATIONS $3,000.00)

2182020 M&O Army 821-3300 P2763-04 S88-021 is used for various projects of a communication nature. For Fiscal Year 1958, approximately $3,000.00 was spent under this project to secure engineering layouts of the ELMER Island Communications Center completed by the U.S. Naval Gun Factory personnel.

4.17.4 ADMINISTRATIVE OVERHEAD (FY 1958 OBLIGATIONS $1,000.00)

2182020 M&O Army P2763-08 821-3410 S88-021. At the current time, and on previous Interim Periods, all administrative expenses at CTG 7.3 Washington Headquarters (located in Naval Gun Factory) are funded for by the Chief of Naval Operations. However, it is planned at present to bring Task Group 7.3 under CJTF SEVEN funds for this expense. The administrative overhead (office equipment and supplies) for the active Operating Phase in the Eniwetok Proving Ground is funded for by Task Group 7.2, as set forth in Paragraph 4.25 of this report.

4.17.5 OPERATIONAL AND LOGISTICAL SUPPORT (FY 1958 OBLIGATIONS $61,000.00)

2182020 M&O Army P2763-07-08 821-3480 S88-021. These funds were sued for various missions and projects assigned to Task Group 7.3, including the providing of support to weather ships and stations which require large amounts of helium, lighting units, and other aerological supplies. A substantial amount of diving equipment and materials was required in support of "WAHOO" and "UMBRELLA". These funds were used to obtain this equipment from various sources. Repair parts and batteries for radiac instruments were also procured with these funds, as well as spare parts for CJTF SEVEN installed equipments placed on ships.

4.17.6 FUNDS

Maintenance and Operations Army funds were sufficient to carry out the assigned missions of the Task Group, although additional funds were requested from CJTF SEVEN from time to time to carry out missions assigned to the Task Group after the Planning Phase. These funds, for the most part, were well-planned and required very little change in the original plans during the Operational Phase. These changes and additions were for the most part brought on by the Johnston Island phase of the Operation.

4.17.7 FUNDING RESPONSIBILITIES

In Operation HARDTACK, considerably more latitude was granted to CTG 7.3 by CJTF SEVEN in the area of determining funding responsibilities, and in independently procuring materials and services required to carry out its mission. In order to properly budget funds for such purposes, a firm agreement should be reached with CJTF SEVEN on Task Group 7.3 responsibility to provide what-and-how material during an Operation (such as aerological materials and helium).

4.17.8 OBLIGATIONS

For comparison purposes, the table below sets forth actual obligations for Fiscal Year 1958, and funds requested for Fiscal Years 1959 and 1960 by allotments. These budget figures were reached by determining the number of men required for an Operation. (See Allotment submittals for details).

	3100	3200	3300	3410	3480
1958	$462,238.00	$ 500.00	$3,000.00	$ 1,000.00	$ 61,000.00
1959	222,000.00	6,600.00		12,000.00	20,000.00
1960	557,000.00	1,000.00		15,000.00	135,000.00

4.18 PROCUREMENT

Due to the varied types of material required by Task Group 7.3 for HARDTACK, the methods of procurement were varied. The paragraphs below go into detail on methods of procurement and reimbursement.

4.18.1 MILITARY INTER-DEPARTMENTAL PURCHASE REQUEST

Military Inter-Departmental Purchase Requests (MIPR's) were used frequently, as Task Group 7.3 comes under Army funds and the major part of the materials were ordered from Naval Supply sources. This required cross disbursement between Army and Navy to pay for materials required. This was handled by the supplier submitting a Standard Form 1080 to Commander Task Group 7.3 for certification. Commander Task Group 7.3 would certify the Standard Form 1080 and forward it to an Army Finance Office for payment.

4.18.2 LETTERS OF REQUEST

Letters of Request were used for a large part of the equipment used in HARDTACK. Due to the type of equipment needed and to the fact it was

(4.18.2 Cont'd.)

not feasible to purchase equipment for the short time it was needed, most equipment was requested from Navy Bureaus, Navy Offices and the Department of the Army on a loan basis. This was handled by letters of Request. The applicable Bureau Office or Department of the Army forwarded the requests to those stock points that had the equipment on hand and could loan the material to Joint Task Force SEVEN or Task Group 7.3 as applicable. This equipment was taken up in the roll-up records quoting these letters of requests as authority.

4.18.3 PURCHASE ORDERS

Purchase Orders were used to a certain extent to procure items of a technical nature from the open market. This was handled by obtaining verbal bids from merchants, comparing prices and buying at the lowest cost possible, in accordance with the many procurement directives. Also, the procurement section of the U.S. Naval Gun Factory Supply Department was requested to procure items quoting CTG 7.3 funds in order to obtain professional help and compliance with procurement regulations. The vendor would submit his bill for payment to Commander Task Group 7.3. Commander Task Group 7.3 would, in turn, certify the bill and forward it for payment to the nearest U.S. Army Finance Office.

4.18.4 REQUISITIONS

Requisitions were used to procure material from Naval sources under the Navy funds provided the Task Group 7.3 Boat Pool. These requisitions were submitted to various Naval Supply Activities and to U.S. Navy ships. These ships, in turn, furnished the material and summarized invoices or the material against the Boat Pool allotment.

4.18.5 JOB ORDERS

Job Orders were prepared in the Eniwetok Proving Ground and submitted to Holmes and Narver for repair work on equipment, and for miscellaneous supplies under funds posted with Holmes and Narver.

4.18.6 ARMY ISSUE SLIPS

Army Issue Slips were used to procure supplies and equipment as needed from Task Group 7.2. These supplies were drawn from Task Group 7.2

(4.18.6 Cont'd.)

as needed on a non-reimburseable basis. The equipment drawn on Army Issue Slips were returned to Task Group 7.2 on completion of the Operation.

4.18.7 PROCUREMENT

Some major examples of procurement are listed in the paragraphs below. It is to be noted that certain types of materials were procured by more than one method.

a. There was a large amount of communications and electronics material required to set up a complete Communications Center on ELMER Island and elsewhere (10 installation segments in all). This was procured by letters of request on the Bureau of Ships. The Bureau was also requested to provide electronic repair parts allowance list of supplies needed to supplement the normal allowance lists of Naval ships and small craft. The ERPALS for all communications equipment was furnished on a non-reimburseable basis by the Bureau of Ships. All communications equipment was provided on a loan basis for the duration of HARDTACK.

b. Due to the fact the Navy was assigned the mission of furnishing weather data from destroyers in the Eniwetok Proving Ground, a large amount of Aerology materials were needed. A letter of request for the equipment was submitted to the Bureau of Aeronautics for action, based on a CJTF SEVEN assignment of supply to CTG 7.3. Bureau of Aeronautics forwarded the letter to the U.S. Naval Air Station, Alameda, California who issued the equipment needed on a loan basis for the duration of HARDTACK. CTG 7.3 was also charged with the procuring helium for the weather balloons. This helium was ordered on MIPR's from the U.S. Naval Air Station, Moffett Field, California, U.S. Naval Supply Center, Pearl Harbor, T.H. and U.S. Naval Station, Kwajalein, M.I. These MIPR's were established well in advance of the Operational Period, so gas would be available in the amounts required in the Eniwetok Proving Ground. Due to the large amount of money involved, the helium bottles were obtained, by approval of the Bureau of Supplies and Accounts, on a loan basis from General Stores Supply Office with the agreement that CTG 7.3 would reimburse General Stores Supply Office for any bottles lost. Task Group 7.3 also furnished other items needed in the Eniwetok Proving Grounds

[redacted] [redacted]

(4.18.7.b. Cont'd.)

by submitting MIPR's to the Aerological Distribution Center, Barbers Point, T.H. All weather balloons were procured by CJTF SEVEN.

c. Diving equipment was procured in various ways. Compressors, a diving work boat and items of a major nature were procured on a loan basis by a letter of request. Diving outfits and diving suits were procured by MIPR's from Naval Supply Sources. Other equipment required, such as Scuba Diving equipment and a rescusitator were purchased on the open market.

d. Repair parts for radiac instruments were procured on MIPR's from the Electronic Supply Office and the U.S. Naval Supply Center, Pearl Harbor, T.H. Electronic Supply Office forwarded MIPR's to applicable supply sources. Batteries for radiac instruments presented a problem, as the instruments used in some cases would not take standard batteries. This required emergency procurement from commercial sources. This could be solved by having all instruments to be used in future Operations checked for battery type prior to departing the continental limits of the United States. Stocks of these batteries could be obtained and placed aboard ships using the instruments.

e. Office equipment and administrative expense for the offices on the different Islands during the Operation were furnished by Task Group 7.2. The requirements for the Task Group were set forth in letters to Task Group 7.2 prior to leaving the continental limits of the United States. The office equipment furnished was very satisfactory as all desks, chairs and file cabinets were either new or completely renovated. The office supplies furnished were for the most part satisfactory. However, some articles were in short supply and were practically impossible to procure in the Eniwetok Proving Grounds. This could be alleviated by closer liaison by Task Group 7.3 with Task Group 7.2. Task Group 7.2 also furnished typewriters for general office use on ELMER Island. These typewriters were new and required adjustment several times before they could be used. An automatic mimeograph machine was also furnished. This was a new machine and was invaluable in running off Operation Orders.

[redacted] [redacted]

[redacted]

(4.18.7 Cont'd.)

f. Administrative supplies for the Staff aboard the Flagship were procured with a stub requisition from the Supply Department of the Flagship, and charged to the flag allotment set up for this purpose.

g. Job Orders were established with Holmes and Narver for emergency repairs to shipboard equipment, boat repairs, automotive repairs, office equipment repairs, and for miscellaneous repairs, supplies and services. Cooperation from Holmes and Narver was excellent and in certain cases they were instrumental in furnishing material required for the mooring element, without which there would have been a possibility of delays in laying of the moors.

h. The office equipment for the Flag Office on the Flagship was shipped from the Task Group 7.3 offices in Washington, D.C. Several typewriters were damaged enroute.

i. A MIPR was established for $5,000.00 at the U.S. Naval Supply Center, Pearl Harbor, T.H. for use of the USS BOXER (CVS-21) for operational support of CJTF SEVEN equipment on board her and various other ships. In addition, another MIPR for $5,556.00 was furnished the BOXER for a large amount of ditto paper, pre-printed communications ditto mats and mimeograph paper. The ditto paper and communications mats were required for the large amount of messages processed by communications on the BOXER. The mimeograph paper was used to run a daily newspaper on the BOXER for morale purposes. This paper was distributed to all ships and units under CTG 7.3 and a limited number of copies to other Task Force Units.

j. Administrative supplies and equipment were furnished by the Chief of Naval Operations during the Interim Period in Washington. This also included utilities and telephone costs. All office equipment such as desks, office machines, etc., belong to the Chief of Naval Operations.

k. The Communications Center on ELMER Island was required to guard several communication channels on teletype, and due to the large volume of messages, a special ditto roll that would run through the teletype machines was needed. These rolls were procured direct from the Ditto Corporation by purchase order as they were not available through any government supply source.

[redacted]

(4.18.7 Cont'd.)

1. All mooring gear for WAHOO and UMBRELLA was furnished by the Bureau of Ships. The requirements for this material were laid down by the Bureau of Ships with the advice of Commander Robert K. THURMAN, USN, an expert in these matters. All materials arrived in the Eniwetok Proving Ground prior to arrival of Staff personnel and only miscellaneous supplies of an emergency nature had to be requisitioned in addition to the planned equipment.

4.19 TRANSPORTATION

General transportation responsibilities and procedures were adequately set forth in Annex B to CTG 7.3 Administrative Plan No. 1-58. Basic responsibilities and procedures were set forth in CJTF SEVEN Standing Operating Procedure 75-1 and changes thereto. No major problems in transportation developed. Both air and water transportation were sufficient, and no hampering backlogs developed during the build-up and Operating Period for either passengers or cargo. Air transportation of emergency material requirements from both the continental limits of the United States and Pearl Harbor was excellent with LNOs Travis and Hickam doing a fine expediting job. See TABLE II for a summary of transportation funding responsibilities.

4.19.1 PASSENGER TRANSPORTATION

Bookings for Military Air Transport Service (MATS) transportation of passengers were carried out in three increments in accordance with instructions contained in CJTF SEVEN Standing Operating Procedure 75-1. The JTF-7-T-8 report provides firm estimates of lift (passenger, cargo, mail) for the fourth succeeding month and estimates of the fifth and sixth months, followed by the JTF-7-T-10 report which indicates passenger lift requirements for the following month by days in numbers only. The third increment is to provide the JTF SEVEN LNO at Travis a firm schedule of personnel by names and dates of arrival at Travis prior to the Eniwetok Proving Ground deployment of personnel in order that firm bookings by flight number can be made and personnel advised when to reach Travis. The same procedure obtained in making bookings with Commander U.S. Army Task Group 7.2 for return of passengers to the continental limits of the United States. It is noted that effective 1 July 1958, Task Groups were provided a passenger and cargo fund allocation

[redacted]

(4.19.1 Cont'd.)

for Military Air Transport Service (MATS) transportation outside the continental limits of the United States.

4.19.2 MILITARY AIR TRANSPORT SERVICE (MATS)

Military Air Transport Service (MATS) bookings were carried out in accordance with CJTF SEVEN Standing Operating Procedure 75-1. Personnel of CTG 7.3 are usually transported by Naval vessel; however, at the end of Operation HARDTACK, arrangements were made to transport approximately 200 personnel to the continental limits of the United States by Military Sea Transportation Service (MSTS) vessel.

4.19.3 INTER-ISLAND

Inter-Island (ENIWETOK to BIKINI) bookings of air passengers were made by SOPA (ADMIN) BIKINI and ENIWETOK. There were no difficulties in securing needed space. Ordinarily, one cargo and one passenger flight was made daily each way. Helicopter flights and L-20 flights were made frequently between ELMER and FRED at ENIWETOK.

4.19.4 LIFT FIGURES

For guidance purposes, TABLE I to this Section contains a schedule of passenger and cargo actually shipped by month in the major channels by CTG 7.3. Provisions should be made for approximately 25 emergency leave cases per month during Operation, based on a total Naval population afloat and ashore of approximately 6,000 personnel.

4.19.5 FUNDING

Funding procedures for passengers traveling via Military Air Transport Service (MATS) have been set forth in CJTF SEVEN Standing Operating Procedure 170-3 of 19 June 1958. Payment for commercial air transportation was provided under allotment 3100 granted to CTG 7.3 by CJTF SEVEN. Total obligations for commercial air transportation for Fiscal Year 1958, covering the build-up period of Operation HARDTACK, approximate $28,000.00.

4.19.6 CARGO TRANSPORTATION (MATS)

Regulations pertaining to estimating and booking of air and water cargo are contained in CJTF SEVEN Standing Operating Procedure 75-1, and CJTF

[redacted]

[redacted] [redacted]

(4.19.6 Cont'd.)

SEVEN Standing Operating Procedure 170-3 covers funding for Military Air Transport Service (MATS) cargo. Shipments generated directly by CTG 7.3 were easily controlled since an AMD had to be secured in advance from the JTF SEVEN LNO. However, frequently requests for materials were passed to Bureaus, and in turn to Supply Demand Control Points and then to the shipping activities, resulting in shipments via Military Air Transport Service (MATS) chargeable to CTG 7.3 cargo allocations but with no direct control by CTG 7.3. Because of the relatively minor amounts of such cargo involved, no trouble was encountered. In general, all air cargo requirements of CTG 7.3 were met without difficulty, including emergency requirements of spares for ships. See TABLE I for total tonnages shipped and charged to CTG 7.3 cargo allocations.

A special records flight, transferring CTG 7.3 records and office equipment from Headquarters in Washington, D.C. to the Eniwetok Proving Ground, was set up on 8 March 1958 by CJTF SEVEN. The CTG 7.3 shipment comprised 183 boxes weighing 7,740 pounds and 330 cubic feet. Approximately 10,000 pounds of material were returned to CTG 7.3 Headquarters in Washington, D.C. at the end of the Operation.

4.19.7 CARGO TRANSPORTATION WATER

Shipments via water were primarily made on Naval vessels, including the YFNB-20, and the major part of target mooring gear being transported to the Eniwetok Proving Ground on the target vessels. Ten (10) helicopters plus organizational supplies of Marine Helicopter Transport Squadron (Light) 361, were shipped via Military Sea Transportation Service (MSTS), with a later increment of the squadron transported on the USS BOXER (CVS-21). The BOXER also transported a considerable amount of trailers, vehicles, etc., for other Task Groups. The BOXER aided in transporting scientific trailers and airplanes to Pearl Harbor from the Eniwetok Proving Ground and from Pearl Harbor to CONUS.

4.19.8 INTER-ATOLL WATER TRANSPORTATION

Shipments were made on an as-available basis, on either Naval vessels, or via T-LST. No major difficulties were encountered although schedules were not held to, particularly after the Johnston Island phase began. Inter-Atoll

[redacted] [redacted]

[redacted]

(4.19.8 Cont'd)

transportation schedules were provided by CJTF SEVEN and Holmes and Narver.

4.19.9 VEHICLES

Vehicle requirements in the Eniwetok Proving Ground were requested in advance from, and furnished by, Commander U.S. Army Task Group 7.2, with the exception of Marine Helicopter Transport Squadron (Light) 361 on NAN, which brought its own vehicles as part of the squadron organizational equipment. Requirements were satisfactorily met as follows:

ELMER

1 - Jeep, Flag use.

1 - Jeep, Building 221.

1 - Jeep, Building 221 SOPA (ADMIN) ENIWETOK.

1 - ½ Ton Pickup Truck, Building 221.

1 - 1½ Ton Truck for Warehouse Operations.

1 - Fork Lift, 6000 pounds capacity.

FRED

1 - 1½ Ton Truck for Warehouse Operations.

1 - 1½ Ton Truck for Passenger and Baggage pickup at MATS.

1 - Fork Lift, 6000 pounds capacity.

DAVID

1 - 3/4 Ton Truck (4 wheel drive essential) for Camp PARSONS Operations.

NAN

1 - Jeep, SOPA (ADMIN) BIKINI.

1 - ½ Ton Truck for Boat Pool.

1 - 3/4 Ton Truck (4 wheel drive) SOPA (ADMIN) BIKINI (Mail and Cargo)

1 - 2½ Ton Truck (4 wheel drive) Cargo Operations.

1 - Fork Lift, 6000 pounds capacity.

* USS BOXER (CVS-21) had four (4) vehicles ashore to aid in cargo and personnel transportation and for running of Camp BLANDY.

4.20 REPLENISHMENT

Provisions replenishment responsibilities and procedures were set forth in Annex A to CTG 7.3 Administrative Plan 1-58 and in CTG 7.3 NOTICE 04235 of 8 January 1958, and the scheduling of reefer ships (AF) was set forth in Appendix 2 to Annex A. The overall system based on experience gained in

[redacted]

(4.20 Cont'd.)

Operation REDWING and past operations, and results were excellent, although several ships stated it was difficult to plan requirements and submit requisitions 30 days in advance of the on-berth date at Pearl Harbor of the reefer ship (AF). Quality of fresh provisions varied, but was generally good.

The USS KARIN (AF-33) and USS MERAPI (AF-38) had ample capacity to provide for the Navy, Commander U.S. Army Task Group 7.2, and Holmes and Narver requirements, plus general stores ordered by ships and units of Commander Task Group 7.3.

The presence of the USS BOXER (CVS-21) at BIKINI was mandatory to take overflow provisions and to hold provisions for units operating out of BIKINI that could not be scheduled for replenishment during the reefer's stay there. The four (4) 600 cubic feet capacity reefers at the ELMER Warehouse (2 chill and 2 frozen) were used to capacity on several occasions to otherwise hold provisions for non-present units at ENIWETOK.

Reefer (AF) ships anchored at BIKINI and deliveries were made by LCMs, with ships furnishing hold working parties. At ENIWETOK, reefer (AF) ships were brought alongside the pier, and provisions were discharged outboard for ships and simultaneously discharged dockside for Commander U.S. Army Task Group 7.2 and Holmes and Narver. It was found that four (4) LCMs (Two working alternately at the chill hatch and two at the freeze, to deliver to individual vessels) plus an LCU bow to bow at the #2 hatch to receive and deliver dry stores for all vessels, made a fast working combination. Holmes and Narver provided stevedores and winchmen at ENIWETOK.

Comments contained in CTG 7.3 letters L17-6 Serial 1121 of 28 April 1958 and L17 Serial 1255 of 3 June 1958 respectively, to the Commanding Officer, USS KARIN (AF-33) in answer to recommendations of procedures other than those used are of interest.

4.21 FUNDING

The responsibility for funding CTG 7.3 operations in the Eniwetok Proving Ground is basically set forth in the following noted papers. The "Agreement Between Atomic Energy Commission and Department of Defense on Costs and Responsibilities for Operations at Pacific Proving Grounds"

[redacted]

(4.21 Cont'd.)

outlines funding responsibilities of Atomic Energy Commission and the Department of Defense. The "McNeil letter" (OPNAV INSTRUCTION 7140.3 of 4 October 1956) sets forth basic rules pertaining to the division of funding responsibilities between the services and the Task Force. Additional guide lines are contained in Part 3 of the Armed Forces Special Weapons Project Manual for Budgeting of 1 April 1957. CJTF SEVEN has published a Funding Guide containing the above references as well as tabular charts that aid in placing funding responsibility.

In addition to the above written guidelines, funding responsibilities in doubtful areas have in many cases been set by precedence. These are generally understood and can be obtained by discussion with experienced comptroller personnel of CJTF SEVEN and other Task Groups. An example during HARDTACK is that the Bureau of Ships budgeted substantial funds to pay for ships, mooring gear, equipment, and personnel, including travel, engaged in WAHOO and UMBRELLA events which normally would have been budgeted for as a scientific project under Armed Forces Special Weapons Project.

There are three (3) major areas in which budget submittals for Fiscal Years 1959 and 1960 may differ in respect to funding responsibilities as against past precedence. They are as follows:

a. The plan to charge all CTG 7.3 administrative expenses in Washington, D.C. Headquarters to CJTF SEVEN funds instead of to the Chief of Naval Operations, as in the past.

b. The plan to charge the per diem of P2V patrol squadron personnel, when deployed to Kwajalein, to CJTF SEVEN funds rather than to have the Commander Naval Air Force, U.S. Pacific Fleet provide such funds, based on the premise that such support is over and above that normally furnished by the Navy, and to bring the funding responsibility more in line with support funds furnished by CJTF SEVEN to CTG 7.3 and CTG 7.4.

c. The funding by CJTF-7 for additional barracks and other construction required on Kwajalein by a P2V patrol squadron for another operation.

[redacted]

(4.21 Cont'd.)

A study regarding the feasibility of basing the P2V patrol squadron on FRED instead of Kwajalein is presently being made, and a decision to do so would eliminate the requirement enumerated in sub-paragraph c above. CJTF-7 would still have to provide squadron per diem funds as set forth in sub-paragraph b above.

The Procurement and Budgeting and Cost Report Sections of this report give indications of the requirements and sources of funds provided directly to CTG 7.3. It is a duty of the CTG 7.3 Comptroller, prior to an Operation, to also see that all activities having Navy support responsibilities for an Operation have understood and budgeted for such responsibilities. Cases in point are the U.S. Naval Station, Kwajalein responsibilities, and the CTG 7.3 letter Serial 027 of 11 March 1957 to the Chief, Bureau of Ships which outlines budgetary responsibilities as determined by CTG 7.3 planning. There is also the responsibility to see that Type Commanders understand that active ships attached to the Task Group will undoubtedly require augmentations in target allotments to prepare for extended overseas operations. (See also paragraph 4.24 of this section of this report).

In addition to the above, CTG 7.3 was unofficially responsible for aiding in controlling expenditures of funds against two (2) other financial sources; the Bureau of Ships allotment to the Task Group 7.3 Boat Pool, and the Bureau of Ships funds granted to cover work performed for target and active ships in the Eniwetok Proving Ground by Holmes and Narver. The funds and control procedures were set forth in CTG 7.3 INST 7302.1 of 17 February 1958, and worked extremely well.

4.22 SUPPLIES AND SUPPLY SERVICES

CTG 7.3 Administrative Plan 1-58, and pertinent Annexes thereto, outlined procedures and responsibilities in regard to supplies and supply services. Comments on individual subjects are contained below.

4.22.1 PAY AND PER DIEM

Although paragraph 2c(12) of Annex A to CTG 7.3 Administrative Plan 1-58 authorized disbursing officers to carry four (4) months supply of money, several ships were short of cash to make payments.

[redacted]

(4.22.1 Cont'd.)

Paragraph 8 of the Administrative Plan, and paragraph 3 of Annex C to the plan covered disbursing responsibilities, with the following comments:

The assignment in advance of major vessels to pay elements of CTG 7.3 without disbursing facilities did not work out too well because of the constant movement of the assigned vessels.

The Task Group 7.3 Boat Pool at BIKINI was manned with one (1) DK2, who was of great aid in providing disbursing information, keeping track of pay accounts, arranging pay days, and helping assigned ships in computing pay due. Similar services at ENIWETOK for approximately 39 officers and 509 enlisted men became an additional burden of the Supply Officer.

The placing of additional pay accounts (plus per diem payments) on shipboard Disbursing Officers created a considerable burden.

The Finance Officer of Commander U.S. Army Task Group 7.2 provided aid in computing and making payments of temporary additional duty (TAD) for personnel of the Special Projects Unit.

CTG 7.3 letter Serial 1296 of 4 June 1958, concerning per diem, indicates that personnel who are quartered and messed on board the YFNB, LCUs, and YTBs do not rate per diem in accordance with a Bureau of Naval Personnel decision. CJTF SEVEN letter J-1/200.3 of 9 May 1958, contains information on limitations of payment of per diem for periods in excess of 180 days in any one location.

4.23 FOREIGN MERCHANDISE

After securing necessary approval of the Commander Service Force, U.S. Pacific Fleet and the Chief, Bureau of Supplies and Accounts (See CTG 7.3 letter Serial 0109 of 10 July 1957 and subsequent correspondence in the Logistics L-4 files) a program for procurement of foreign merchandise from Hong Kong and Yokosuka was promulgated by CTG 7.3 INSTRUCTION 04230.1 of 30 December 1957.

The first increment of the plan called for the USS BOXER (CVS-21) to purchase a stock inventory of foreign merchandise for equitable distribution to all ships. In practice, most of the merchandise (amounting to approximately $28,000.00 in cost) was sold on the BOXER before arrival in the

[redacted]

(4.23 Cont'd.)

Eniwetok Proving Ground of other vessels who could have participated. Unfortunately, the BOXER was at BIKINI while the preponderance of CTG 7.3 personnel and units were at ENIWETOK. It is believed that a $50,000.00 inventory could have been sold as readily, particularly if it had been more available to ENIWETOK based personnel and ships.

The second increment of the plan allowed personnel to make special orders of foreign merchandise. The USS BOXER (CVS-21) alone placed 2,278 individual orders worth approximately $75,000.00 for personnel of her crew and for CJTF SEVEN, CTG 7.1, CUSATG 7.2, CTG 7.3, CTG 7.4, CTG 7.5 and HMR(L)-361 personnel. A number of other ships with Ship's Stores aboard independently placed special orders also. Ships ordering merchandise from Hong Kong included the USS BOXER (CVS-21), USS MONTICELLO (LSD-35), USS MUNSEE (ATF-107), USS BOLSTER (ARS-38), USS GRASP (ARS-24), USS HOOPER ISLAND (ARG-17) and USS CACAPON (AO-52).

As evidenced by correspondence available in files, supervision of the foreign merchandise program took substantial time and effort. The USS BOXER (CVS-21) did an outstanding and indispensable job in taking, coordinating and placing orders, and in effecting deliveries. Although CTG 7.3 INSTRUCTION 04230.1 covered only "Navy personnel", Commander Service Force, U.S. Pacific Fleet had no objection to personnel of other Task Groups, including civilians, participating.

Yokosuka merchandise was received in the Eniwetok Proving Ground on the 20th of May, 1958 by the USS MERAPI (AF-38), and the Hong Kong merchandise on the 13th of June 1958, by the USS KARIN (AF-33), in what amounted to perfect condition. Outstanding effort and cooperation were provided to the program by the Navy Purchase Branch, Hong Kong, and by the U.S. Naval Supply Depot, Yokosuka, as well as the U.S. Naval Supply Center, Pearl Harbor and Commander Service Force, U.S. Pacific Fleet.

CTG 7.3 NOTICE 5840 of 23 April 1958, contained information on customs clearance procedures applicable to foreign merchandise purchased.

Although requiring tremendous additional effort by all concerned, the program was a distinct success, and provided a substantial morale booster

[redacted]

(4.23 Cont'd.)

in what was otherwise a long and arduous tour of duty for participating personnel.

4.24 SHIP'S SUPPLY

Annex A to CTG 7.3 Administrative Plan 1-58 set forth ship's supply responsibilities and procedures, as well as such additional sections as paragraph 1c(1) of the basic plan which states that each ship would be considered to be self-supporting. The following comments are made:

Ships were specifically requested to have 100% of allowance on board of engineering spare parts, communication and teletype equipment, and radiac instrument batteries. In general, the allowance list status of ships appeared to be good, and no major problems developed for lack of technical spares. When required, parts were secured from other ships, from Holmes and Narver (particularly engineering parts) and if necessary, by air delivery from U.S. Naval Supply Center, Pearl Harbor, T.H. Supply support of items stocked at U.S. Naval Supply Center, Pearl Harbor, T.H. was excellent. Supply support, when passed to continental limits of the United States supply activities, was relatively poor.

In spite of the fact that estimated ship requirements for radiac batteries were given by CTG 7.3 in advance to U.S. Naval Supply Depot, San Diego, U.S. Naval Supply Center, Pearl Harbor, T.H., and Electronics Supply Office; the supply system was not adequately stocked with some items. In addition, certain battery requirements were not contained in the original estimated requirements letter.

In the area of general stores and clothing and small stores, most ships underestimated requirements, and mainly because of the large demands made on them by the smaller vessels such as the ATFs, ARSs, etc., and by the CTG 7.3 Boat Pool, Boat Pool Detachment, etc., personnel. Shortages were also felt in such areas as gray paint, rags, office supplies and other fast consumables. An exception to the above was the USS BOXER (CVS-21), which was extremely well loaded and acted in effect as a fleet supply ship in providing general stores to numerous units. Issue statistics are set forth in the USS BOXER (CVS-21) final report. Ships did not utilize as much as possible the

[redacted]

(4.24 Cont'd.)

general stores resupply system from U.S. Naval Supply Center, Pearl Harbor, T.H. via the USS KARIN (AF-33) and USS MERAPI (AF-38). (See paragraph 1, Annex B to CTG 7.3 Administrative Plan 1-58).

The comments in the paragraph above also apply to Ship's Store Stock. Again, the USS BOXER (CVS-21) had a wide range of stores and transferred items to many ships. The BOXER was also the major source of supply for canned soft beverages, candy, peanuts, fritos, etc., sold by both Camps PARSONS and BLANDY.

It should be noted that many ships hesitated to transfer general and technical stores to either CTG 7.3 or to ships of other administrative commands, even on requisitions providing chargeable funds, because credits for such cash sales or transfers do not revert to the operating target allotment of the issuing ship, which would claim it could not get an increase from its Administrative Command to replace the issued items.

4.25 CTG 7.3 STAFF SUPPLY

Under the concept of a split Staff type of organization in Operation HARDTACK, provisions had to be made for administrative supplies, equipment, and services for the Staff element on the USS BOXER (CVS-21) (and including SOPA (ADMIN) BIKINI) and for the CTG 7.3 Staff Detachment, ENIWETOK (including SOPA (ADMIN) ENIWETOK).

The USS BOXER (CVS-21) Flag Allowance of office equipment was supplemented by shipping typewriters, etc., from the CTG 7.3 Headquarters in Washington, D.C. Letters in advance of deployment were sent to the USS BOXER (CVS-21) estimating total administrative supply requirements of CTG 7.3 and requested the BOXER to stock such quantities. Actual usage rates of major items of supply are set forth in TABLE III to this Section. Supplies were paid for as follows:

a. Those supplies normally chargeable to a Flag afloat were charged to the Flag Allotment provided by Commander Service Force, U.S. Pacific Fleet.

b. Those supplies (the majority) pertaining to administrative requirements of CTG 7.3 as Deputy CJTF SEVEN for Navy were charged to the

[redacted]

(4.25.b. Cont'd.)

CTG 7.3 M & O Army allotment 3480.

In accordance with CJTF SEVEN Administrative Plan 1-58, Commander U.S. Army Task Group 7.2 was given the responsibility of issuing without reimbursement all expendable housekeeping and office supplies to Air Force and Navy elements. This was interpreted to mean other than for active Navy ships. CTG 7.3 letter Serial 181 of 11 July 1958 was written to Commander U.S. Army Task Group 7.2 "laying on" expected requirements. Supply response was in general good, with some items, such as ditto mats, in short supply. Actual consumption of more important items is listed in TABLE IV to this Section for guidance purposes.

Typewriter repair service was furnished by Holmes and Narver, as well as numerous other services, such as sign painting, etc., provided under, CTG 7.3 letter Serial 195 of 18 July 1957 to CJTF SEVEN listed office furniture and equipment requirements at the Eniwetok Proving Ground. In general, requirements at Eniwetok were filled by Commander U.S. Army Task Group 7.2 and at BIKINI by the Atomic Energy Commission (Holmes and Narver). There were no shortages or difficulties.

CTG 7.3 letter Serial 0115 of 19 July 1957 and subsequent correspondence determined office equipment and furniture, including BOQ and barracks furniture required by U.S. Naval Station, Kwajalein in support of the Patrol Squadron (VP-28). These items were provided by CUSATG 7.2.

4.26 SUBSISTENCE

CTG 7.3 letter Serial 0114 of 16 July 1957 to the Naval Subsistence Office requested a 25% increase in the ration allowance for ships under operational control of CTG 7.3 while deployed in the forward areas. This was granted, as in past operations.

The 25% differential was very popular and did provide for better feeding and morale. At the same time, it did not lead to wastage, and while CTG 7.3 did not get copies of all provisions returns, indications are that it was not necessary to use it entirely. For example, the actual cost or rations for the Task Group 7.3 Boat Pool personnel subsisting on small craft for April 1958 was $1.24 as compared to a total allowance of $1.64 per ration.

[redacted]

(4.26 Cont'd.)

One ship did state that the increase in ration allowance was not particularly helpful because it was still restricted from selecting some of the better grades of food because of Bureau of Supplies and Accounts Manual limitations; for example, it still had to adhere to the standard percentages of boneless beef. This could be clarified in future instructions with Bureau approval.

CTG 7.3 INSTRUCTION 07330.2 of 11 February 1958 provided accounting instructions for subsistence of small craft in accordance with Navy Subsistence Office letter Serial 03 of 10 January 1958. The provision for the assignment of mother ships in paragraph 3 of the later letter was not workable because of the constant movements of such ships.

4.27 CLASS "X" CLOTHING

Class "X" clothing consisted of khaki shirts and shorts provided to all shore-based CTG 7.3 personnel at BIKINI and ENIWETOK (4 sets per man) on a loan basis by Commander U.S. Army Task Group 7.2. Quantities by size were requested by Commander U.S. Army Task Group 7.2 prior to operational deployment, and all demands were met. Clothing was returnable to Commander U.S. Army Task Group 7.2 at the end of the Operation. It is understood that such clothing will not be furnished in future Operations.

4.28 WAREHOUSE OPERATIONS

The Navy operated two (2) warehouses during the Operational Period, both 4,000 square feet in capacity. Building 651 in the Navy Warehouse on FRED, and Building 517 at ELMER. Both had adequate outside storage space. Any storage requirements at NAN were provided by Holmes and Narver. Office supplies were stored in transportainers outside of the Headquarters Building 221, ELMER.

ELMER warehouse was used primarily as a transit warehouse. General cargo from Military Sea Transportation Service (MSTS) ships and Navy reefer (AF) ships consigned to Task Group 7.3 ships was off-loaded at ELMER by Holmes and Narver, and delivered or reshipped as applicable by the CTG 7.3 warehouse personnel. Approximately 85 tons of general cargo passed through this warehouse each month, during the Operation Period. Helium, weather balloons and other aerological supplies were stored at the warehouse for issue

(4.28 Cont'd.)

to the destroyers. Issues and receipts of empty cylinders were accountable for on memo invoices. One (1) SK and three SN were assigned to this warehouse. This number was adequate.

Four 600-cubic foot reefers are also located at ELMER warehouse; two (2) chill and two (2) freeze. Reefers were filled to approximately 2/3 capacity each time a reefer (AF) ship came in with provisions for ships operating out of port. Approximately 35M tons of dry, chill and freeze cargo provisions were handled every three (3) weeks.

The FRED warehouse handled all air freight cargo arriving by Military Air Transport Service (MATS). Cargo was picked up at MATS terminal by warehouse personnel and recorded, then delivered or reshipped as applicable. Approximately 20 tons of cargo passed through this warehouse each month. Material to be stored for any length of time was handled there. Warehouse personnel also met each incoming MATS flight to assist Task Group 7.3 personnel to get to their destination. Due to planes arriving at various hours day and night, a continuous watch was maintained. Four (4) personnel were assigned to this warehouse. The number was adequate.

The following reports were rendered by warehouse personnel to the Supply Officer to provide movement control:

a. Air Cargo undelivered over two (2) days as occuring.

b. Surface Cargo undelivered over five (5) days as occuring.

c. Weekly inventory of helium and other aerological supplies maintained for issue.

Cargo manifests for incoming water shipments by Military Sea Transportation Service (MSTS) or Navy vessels were forwarded in advance of the vessel's arrival to CTG 7.3 Supply Officer by the Commander U.S. Army Task Group 7.2 Transportation Officer. Manifests were checked off by warehouse personnel and returned to Commander U.S. Army Task Group 7.2 for report purposes.

Outgoing air shipments were turned over to the Holmes and Narver Shipping and Receiving Section, who cut the bill of lading, and transferred the material to FRED to the Military Air Transport Service (MATS) Terminal.

(4.28 Cont'd.)

Inter-Island air shipments were booked and delivered to the cargo terminal by FRED warehouse personnel. Outgoing water shipments were packed, marked and Navy bills of lading prepared by ELMER warehouse personnel and delivered to Navy ships directly, or turned over to Holmes and Narver for booking and handling on Military Sea Transportation Service (MSTS) ships.

In general, warehousing, shipping, and receiving operations were carried out on an expeditious and effective manner, and no recommendations regarding personnel, procedures, or equipment changes are deemed necessary.

4.29 ROLL-UP

The procedure of rolling up from an Operation can be considered to break down into three (3) separate but related tasks:

1. Roll-up of ships and craft, including lifts and tows.

2. Roll-up of personnel, phased out as determined by requirements either by air or water.

3. Roll-up of material.

In turn, roll-up of material breaks down into three (3) related tasks:

1. The recording of all requests for equipment on loan installed in ships, and securing, providing,and rewriting of disposition instructions to ships for such equipment. Ordinarily, the physical shipping documentation, packing and shipping of such equipment is the responsibility of the receiving ship. CTG 7.3 NOTICE 07320 of 25 October 1957, established procedures that worked effectively for this portion of the material roll-up.

2. The returning to Commander U.S. Army Task Group 7.2 of non-expendable materials and equipments furnished in the Eniwetok Proving Ground to CTG 7.3 on a loan basis. This includes a wide variety of items, including vehicles (with special turn-in requirements), tents, office equipment, etc.

3. The returning of equipment borrowed for CTG 7.3 Staff itself, such as the equipment for the ten (10) communications installations in the Eniwetok Proving Ground. In this case, material is physically packed and shipped by CTG 7.3 (or by job order on Holmes and Narver) and returned to the proper source. At the end of HARDTACK, approximately 15 men and 1 officer

[redacted]

(4.29.3 Cont'd.)

remained after other personnel had departed to complete the roll-up and turn-in procedures. The CTG 7.3 warehouse on ELMER was mainly used for this purpose.

4.30 CONCLUSIONS

1. That for future operations the Logistics Officer, Comptroller, Material Officer, Assistant Logistics Officer and necessary storekeepers and the disbursing clerk should conduct operations from ELMER Headquarters Building, whether or not the main Task Group 7.3 Headquarters is located at ELMER or aboard a Flagship at BIKINI.

2. That the allowance of the Task Group 7.3 Boat Pool should contain sufficient personnel to provide for nine (9) personnel to carry out storekeeper and warehousing functions at ELMER, FRED and NAN.

3. That the Logistics Section should be expanded to include one (1) LT for transportation functions to arrive on board by October of the calendar year preceding the operation; that an Assistant Logistics Officer of the grade of LCDR should also be provided for assistance in procurement and managing all details and records concerning all equipments on loan and the roll-up thereof; that a Disbursing Clerk, First Class (DK1) should also be provided to handle disbursement records in the Eniwetok Proving Ground.

4. That 1½ boat crews per LCM should be provided in order that sufficient boat trips may be run at late hours and also on week-ends.

5. That at least 3 YTBs and preferably 4 YTBs should be provided in the event that an underwater shot similiar to WAHOO is conducted in the future.

6. That LCM-3s should be provided in lieu of LCM-6s for future operations since the LSD can not carry as many of the latter; in this regard the LCM-3s used on HARDTACK should be retained since it was apparent prior to HARDTACK that they were becoming increasingly short in supply.

7. That the YFNB-20 should be retained by the Task Group 7.3 Boat Pool at Coronado during the interim period since it has been specially configured and fitted out for operations of the Task Group 7.3 Boat Pool in the Eniwetok Proving Ground; it contains thousands of dollars worth of spare parts and equipage and equipment peculiar to Task Group 7.3 Boat Pool. Its loss could make preparations for the next operation much more difficult and

[redacted]

[redacted] [redacted]

(4.30.7 Cont'd.)

furthermore it can be retained in proper condition by the Task Group 7.3 Boat Pool during the interim period with some increase in personnel over that number retained after REDWING.

8. That about six (6) months prior to deployment a close study should be made of the scheduled deployments of both LSD type ships and ATF towing ships of Commander Service Force, U.S. Pacific Fleet in order to take advantage of opportune lifts.

9. That all planning for the Task Group 7.3 Boat Pool operations should be based on the Task Group 7.3 Boat Pool and Task Group 7.3 Boat Pool Detachment being based ashore at NAN and at ELMER; this allows the LSD to be used for the many and varied requirements initiated by CTG 7.1 and CTG 7.5; that sufficient funds should be obtained from the Bureau of Ships to provide for hull work by the contractor in the Eniwetok Proving Ground.

10. That CTG 7.3 letter Serial 1283 of 31 May 1958 should be reviewed about one (1) year prior to deployment and a check made in the Eniwetok Proving Ground with the contractor and the Atomic Energy Commission Representative to determine if all requirements are being met.

11. That an AO be permanently assigned to Task Group 7.3 or one (1) provided on a rotational basis for ten (10) days out of each monthly period should suffice for replenishment if a YOS is also stationed at ENIWETOK.

12. That an emergency capability for evacuation by ship is necessary at both BIKINI and ENIWETOK Atolls; this requires at least one (1) ship the size of a CVS or LSD or TAP or perhaps an LST at BIKINI and requires at least two (2) large ships at ENIWETOK preferably an APA plus 2 LSTs.

13. Complete and early planning is of vital importance in successful accomplishment of ship modifications for an operation of this scale.

14. By following CJTF SEVEN's Standing Operating Procedure 88-1 of 22 April 1957, most requirements for ship modifications were submitted in a timely and orderly manner.

15. The number of late submissions of "hitherto-unplanned" ship modifications was kept to a minimum by establishing a cut-off date for requirements.

[redacted] [redacted]

(4.30 Cont'd.)

16. Personal contact with other Task Groups, Naval Type Commanders, ships and shipyards was of vital importance in the successful accomplishment of the ship installation phase.

17. The presence of a Repair Ship in the Eniwetok Proving Ground was extremely valuable in maintaining ships of the Task Group in adequate material readiness and in caring for target ships.

18. In spite of proper markings on equipment sent out to the Eniwetok Proving Ground in advance of Task Group 7.3 personnel, shipments do go astray after arrival in the Eniwetok Proving Ground.

19. For a split operation there is a need for a barge or gig at each location.

20. Although there were inevitably a number of minor shortages and problems, the general supply and supply support procedures were effective and did the job with a minimum of personnel involved. CTG 7.3 Administrative Plan 1-58 was a sound and workable basic document.

21. Because of the fact that the destroyer divisions, and APA's rotated, and due to uncertain schedules, ships were hesitant in ordering general stores, clothing and small stores, and ship's store stock via AF delivery. The scheduling of a General Stores fleet issue ship to the Eniwetok Proving Ground two or three times during the operation would have been definitely useful.

22. The 21-day replenishment schedule of the AF's, combined with the 4 reefers at the warehouse, ELMER, provided as workable a system as could probably be devised under the basic operating conditions present at the EPG.

23. The special order portion of the foreign merchandise program was too ambitious and required too much work by the many people and activities involved. It should be de-emphasized, and increased emphasis given to allowing all ships to stock foreign merchandise in the ship's store. This should be discussed with the Navy Ship's Store Office in planning for a future operation.

[redacted] [redacted]

4.31 RECOMMENDATIONS

1. That the Logistics Section be expanded during the pre-operational period to include an Assistant Logistics Officer for transportation, another for roll-up and related procurement functions, and a Disbursing Clerk.

2. That the Logistics Section be stationed at ELMER during the operational period.

3. That the Task Group 7.3 Boat Pool allowance provide for at least nine (9) personnel to carry out warehousing functions at ELMER, FRED and NAN.

4. That 1½ boat crews per LCM be provided in order to insure sufficient transportation.

5. That 3 or 4 YTBs be provided in the event of a future operation involving an underwater shot similar to WAHOO.

6. That LCM-3s be provided for Task Group 7.3 Boat Pool operations in the Eniwetok Proving Ground.

7. That the YFNB-20 be retained by the Task Group 7.3 Boat Pool during the interim period.

8. That an advantage be taken of the scheduled deployment of both LSD and ATF towing vessels in planning the lift of small craft and tows to the Eniwetok Proving Ground.

9. That sufficient large ships be provided in order to maintain an emergency evacuation capability.

10. That all planning should be based on operating the Task Group 7.3 Boat Pool and the Task Group 7.3 Boat Pool Detachment ashore at ELMER and NAN.

11. That all Task Groups be required to submit their complete requirements for ship installations at an early date.

12. That all Task Groups follow to the letter CJTF SEVEN's Standing Operating Procedure 88-1 of 22 April 1957 on Ship Modifications, to insure complete and timely submission of requirements through the proper channels.

13. That a cut-off date for submitting requirements for ship modifications be published for each ship when availability dates are established.

14. That a program of close personal contact be established and maintained with other Task Groups, Naval Type Commanders, ships and shipyards.

[redacted] [redacted]

(4.31 Cont'd.)

15. That non-standard installations be avoided in so far as possible. It appears that the most suitable and economical installation is the use of shelf items, on which all testing and experimenting has been completed by somebody else.

16. That in any future operation involving roughly the same number of ships, a Repair Ship or Tender be included in the Task Group to support the material readiness of other ships assigned.

17. That an advance party of Task Group 7.3 personnel arrive in the Eniwetok Proving Ground some four (4) months before the beginning of the operational period to attend to this Task Group's affairs, such as follows:

a. Storekeepers as necessary to receive, record, and store incoming material.

b. Communications personnel to install and activate Task Group 7.3 equipment.

c. YOS crew to activate machinery and receive initial load of NSFO. This crew will be available to deliver fuel to the first ships arriving in the Eniwetok Proving Ground for off-atoll construction.

d. A small office staff to set up the Task Group 7.3 office, to draw and distribute vehicles, etc.

Members of this advance party could be rotated back to the continental limits of the United States Headquarters to prevent the hardship of unequal tours in the Eniwetok Proving Ground.

18. That a requisition serial number be applied to every letter of request for material or equipment to aid in control of such items, and aid in accountability and roll-up control.

19. That two additional 3/4 Ton Pickup Trucks be requested from CTG 7.2 for next Operation in lieu of four ship's vehicles, plus an additional jeep for duty officer, ELMER and for passenger use at Warehouse, FRED.

20. That pay responsibilities be left flexible in the Administrative Plan.

(4.31 Cont'd.)

21. That a Disbursing Clerk be included on the Staff operational allowance list for any future operation and that the Marine Helicopter Squadron also have a Disbursing Clerk assigned to it.

22. That Administrative Commands be requested, prior to an operation, to increase the Disbursing Clerk (DK) allowance so that one (1) additional one would be available at both BIKINI and ENIWETOK to aid in payments. For example, Commander Amphibious Force, U.S. Pacific Fleet placed an additional Disbursing Clerk (DK) on the USS RENVILLE (APA-227), but the man was not transferred to the relieving ship, the USS MAGOFFIN (APA-199), which had an extremely heavy pay burden with one (1) Disbursing Officer and only one (1) Disbursing Clerk, Third Class (DK3) on board. It is noted that Disbursing Officers were reluctant to compute and pay diver's pay.

23. That on a future operation one (1) ship at BIKINI and one (1) at ENIWETOK be designated to stock foreign merchandise for the early order stage.

24. That radiac battery requirements be carefully figured in advance and given to the Electronics Supply Office so that the supply system can be properly stocked to meet requirements.

25. If time permits, it is recommended that the CTG 7.3 Staff Supply Officer visit ships prior to the next operation to discuss supply problems before their departure to the Eniwetok Proving Ground.

26. That the problem of ships allotments and non-creditable transfers be discussed with all Administrative Commands prior to a next operation, with the goal of participating ships being given permission to automatically increase their operating target allotments by the amount of such transfers.

27. That in future, requirement lists with the Federal Standard Stock Number included be furnished to Commander U.S. Army Task Group 7.2 and follow-up be made prior to operational deployment. Actual consumption of the more important items are listed in TABLE IV to this Section for guidance purposes.

28. That the provision for the assignment of mother ships be eliminated in future operations.

29. That provision be made for at least two ham stations during the

[redacted]

(4.31.29 Cont'd.)

next operation.

30. That provision be made for installation of cyphony to various operating locations of the staff for classified phone calls.

31. That buoys be put in at Bikini to eliminate use of LCMs to push DDs broadside for weather observations.

32. That NSC Pearl, prior to departure of provision ships, dispatch all CTG 7.3 ships a list of preferred items, such as fresh pineapples, papaya, etc., that are not ordinarily known about by the ships and not usually requisitioned 30 days before the on-berth date of the AF.

33. That a flag allotment be not requested in a future operation and that shipboard flag requirements be funded from the O & M Army allotment. The Flag allotment provides an unnecessary complication and additional work for the ship concerned.

34. That a general stores ship be routed via EPG at least three times during the next operation.

35. That issue and control of all aerological supplies be made from the beach in a future operation.

[redacted]

[redacted]

TABLE I - AIR TRANSPORTATION PASSENGER AND CARGO

EASTBOUND		PASSENGER	CARGO
OCT 1957	HIK-SUU	4	0
JAN 1958	ENI-SUU	3	0
FEB 1958	ENI-SUU	3	0
	ENI-HIK	2	0
	ENI-KWA	2	0
MAR 1958	ENI-KWA	2	0
	ENI-HIK	13	.5
	ENI-SUU	30	0
	KWA-HIK	1	0
APR 1958	KWA-HIK	1	0
	HIK-SUU	1	0
	ENI-KWA	7	1
	ENI-HIK	12	1
	ENI-SUU	30	0
MAY 1958	KWA-HIK	1	0
	HIK-SUU	5	0
	ENI-KWA		0
	ENI-HIK	3	0
	ENI-SUU	59	.5
	ENI-JON	1	0
JUNE 1958	KWA-HIK	41	0
	HIK-SUU	8	0
	ENI-KWA	1	0
	ENI-HIK	51	0
	ENI-SUU	97	0
	ENI-JON	2	0
	KWA-SUU	4	0
JULY 1958	KWA-HIK	75	0
	HIK-SUU	39	1.6
	ENI-HIK	29	3
	ENI-SUU	129	0
	ENI-KWA	3	0
	ENI-JON	2	2.5
	KWA-SUU	2	0
AUG 1958	KWA-HIK	19	0
	HIK-SUU	23	0
	ENI-KWA	1	0
	ENI-HIK	7	1.5
	ENI-SUU	133	0
	ENI-JON		4
SEP 1958	KWA-HIK	1	0

WESTBOUND		PASSENGER	CARGO
SEP 1957	SUU-HIK	4	0
	SUU-ENI	4	0
	KWA-ENI	3	0
OCT 1957	HIK-ENI	5	0
	KWA-ENI	1	0
	SUU-HIK	4	0
	SUU-ENI	4	.6
NOV 1957	HIK-ENI	2	0
	KWA-ENI	5	0
	SUU-ENI	11	2
DEC 1957	HIK-ENI	1	0
	SUU-ENI	9	.1
JAN 1958	HIK-ENI	5	1.2
	KWA-ENI	6	0
	SUU-HIK	2	1.8
	SUU-ENI	108	25.4
	HIK-KWA	5	0
FEB 1958	HIK-ENI	5	1.7
	KWA-ENI	1	0
	SUU-HIK	2	1
	SUU-ENI	51	2.7
MAR 1958	HIK-ENI	16	3.6
	KWA-ENI	14	0
	SUU-HIK	1	0
	SUU-ENI	97	5.7
	HIK-KWA	3	0
APR 1958	HIK-ENI	12	7.8
	KWA-ENI	6	0
	SUU-ENI	44	10.5
MAY 1958	SUU-HIK		
	HIK-KWA		
	KWA-ENI	3	
	SUU-ENI	45	7.9
	HIK-ENI	39	3.8
	KWA-GUAM	1	
JUNE 1958	SUU-HIK	1	
	HIK-KWA		
	KWA-ENI	7	
	SUU-ENI	33	1.4
	HIK-ENI	24	2.8
	KWA-TYO	2	
JULY 1958	SUU-HIK	3	.1
	HIK-KWA	1	
	KWA-ENI		
	SUU-ENI	73	2.3
	HIK-ENI	42	2.2
	SUU-JON	2	
AUG 1958	SUU-HIK		
	HIK-KWA		
	KWA-ENI		
	SUU-ENI	2	.5
	HIK-ENI	4	.5
	SUU-JON	1	
SEP 1958	SUU-ENI	2	.1
	HIK-ENI	5	
	HIK-JON	1	
	KWA-JON	1	

[redacted]

TABLE II - TRANSPORTATION FUNDING RESPONSIBILITY

LOCATION	CARRIER	FUNDING RESPONSIBILITY
		CARGO
CONUS	COMMERCIAL	AEC, ARMY, NAVY, AND AIR FORCE PAY FOR SUPPLIES AND EQUIPMENT TO TIDEWATER, ETC. JTF-7 AND TASK GROUPS PAY FOR ORGANIZATIONAL SUPPLIES AND EQUIPMENT MOVED WITH HEADQUARTERS DURING OPERATION.
TIDEWATER TO EPG	MSTS	JTF-7 PAYS FOR ALL CARGO USED IN SUPPORT OF OPERATIONS.
EPG TO TIDEWATER	MSTS	JTF-7 PAYS FOR ALL CARGO RELATED TO THE OPERATION.
TRAVIS TO EPG EPG TO TRAVIS	MATS	BILLINGS WILL NOT BE MADE UNTIL 1 JULY 1958. BILLING PROCEDURE HAS NOT BEEN DETERMINED BY MATS AS YET.
CARGO HANDLING AT TIDEWATER	NONE	JTF-7 REIMBURSES OAKLAND NSC FOR ONLY JTF-7 CARGO HANDLED.
		PERSONNEL
CONUS	COMMERCIAL	JTF-7 PAYS FOR TDY EXPENSES OF JTF-7 PERSONNEL AND CERTAIN MILITARY OR CIVILIAN PERSONNEL PERFORMING DUTIES FOR JTF-7. ALL PCS OF PERSONNEL FIRST REPORTING TO JTF-7 WILL BE BORN BY THE SERVICE CONCERNED.
TIDEWATER TO EPG EPG TO TIDEWATER	MSTS	JTF-7 PAYS FOR JTF-7 PERSONNEL.
TRAVIS TO EPG EPG TO TRAVIS	MATS	NOT REIMBURSABLE UNTIL 1 JULY 1958. BILLING PROCEDURE HAS NOT BEEN WORKED OUT BY MATS.

TABLE III - USAGE OF ADMINISTRATIVE SUPPLIES - USS BOXER (CVS-21)

Listed below are items, with usage data, that represent the higher cost items for Flag use aboard the USS BOXER (CVS-21) per average month:

NOMENCLATURE	STOCK NUMBER	USAGE
PAPER, Mimeograph 8 X 10½	7530-244-2678	128 reams/month
PAPER, Teletype	7530-223-7970	300 rolls/month
PAPER, Bond 8 X 10½	7530-254-1030	12 reams/month
PAPER, Duplicating (white)	7530-228-2096	320 reams/month
PAPER, Duplicating (pink)	7530-228-2095	32 reams/month
MATS, Ditto 8 X 10½	7530-634-2827	11 boxes/month
FLUID, Duplicating liquid	7530-278-9800	16 gallons/month
BAGS, Burn	7530-174-0869	500/month
TAPE, Teletype	7530-272-9422	96 reels/month
MATS, Ditto	7530-277-5190	8200/month
STENCILS	7530-740-1567	15 quire/month

TABLE IV - USAGE OF ADMINISTRATIVE SUPPLIES AT ELMER ISLAND FROM 15 MARCH TO 15 MAY 1958 FOR PLANNING PURPOSES

NOMENCLATURE	QUANTITY	UNIT
BOOK, Record 188 Pages	20	EA
TELETYPE, Ribbons	10	EA
GLUE, Paper	2	BTL
PAPER, White Bond 8 X 10½	12	RM
PAPER, Manifold White 8 X 10½	46	RM
PAPER, Manifold Pink 8 X 10½	26	RM
PAPER, Manifold Green 8 X 10½	12	RM
PAPER, Pads Writing	90	PDS
ENVELOPES, 3 7/8 X 8 7/8	55	CTN
ENVELOPES, 8 1/2 X 11 1/2	5.5	CTN
ENVELOPES, 9 1/2 X 12	18	CTN
ENVELOPES, 10 X 15	5	CTN
ENVELOPES, 4 1/2 X 9 1/2	40	CTN
PAPER, Carbon 8 X 10½	19	BX
PAPER, Carbon 8 X 13	3	BX
ERASERS, Typewriter	12	EA
CLIPS, Paper	85	BOX
RUBBER, Bands	4	BOX
STAPLES	37	BOX
MACHINE, Stapling	6	EA
PERFORATOR, Paper, 2 Hole	12	EA
SHARPENER, Pencil	4	EA
TAPE, Masking 2"	10	RL
INK, Blue Black	1	BTL
INK, Stamp Pad, Red	6	BTL
INK, Stamp Pad, Black	6	BTL
PENCILS, Lead #1	144	EA
PENCILS, Lead, Red	144	EA
PENCILS, Lead, Blue	72	EA
PENCILS, Lead, Drawing	10	EA
PAPER, Mimeograph 8 X 13	5	RM
PAPER, Mimeograph 8 X 10½	50	RM
STENCILS, Mimeograph	10	QR
TAPE, Scotch	16	RL
CALENDARS W/Stands	20	EA
TYPEWRITER, Ribbon	33	EA
PAPER, Ditto, White	415	RM
PAPER, Ditto, Pink	8	RM
PAPER, Ditto, Yellow	3	RM
PAPER, Ditto, White 8 X 13	25	RM
FLUID, Ditto	25	GL
MATS, Ditto	12	BOX
PAPER, Teletype, 3 Ply	48	RL
TAPE, Teletype	80	RL
PAPER, Teletype, Single Ply	84	RL
OIL, Teletype	1	QT
INK, Mimeograph	20	CNS
FASTENERS, Paper	30	BOX
BOARD, Clip	10	EA
FOLDERS, File Legal	500	EA
FOLDERS, File Letter	300	EA
PENS, Sets	12	EA
PADS, Stamp	1	EA
BLOTTERS	12	PKG
BINDERS, 3 Ring	6	EA
RULERS, 12"	12	EA
CARDS, Salmon 5 X 8	2	PKG

[redacted] [redacted]

TABLE V - OPERATION HARDTACK NON-SCIENTIFIC NAVY COSTS; PARTIAL

Direct support costs incurred for Operation HARDTACK by Navy for period 1 September 1956 through 30 June 1958. This does not include scientific costs, which are reported to CJTF-7 separately via AFSWP, although they are Navy appropriations (BuOrd, BuShips, laboratories, etc.)

1.	Travel, material and military pay for: CTG 7.3 Staff Boat Pool Boat Pool Detachment Special Projects Unit Decontamination Unit	$2,034,564
2.	BuShips Costs: Supplies and Equipage Alterations Activations Inactivations, Preservation Charter and Hire (LST's) Travel and Per Diem Project Support (Mooring gear, etc.)	$5,994,865
3.	BuPers (Training books, decontamination)	$ 700
4.	Navy Research Lab	$ 20,500
5.	Operation maintenance and military pay VP-28 Squadron and UF Squadron	$1,296,935
6.	Operations, maintenance and Military Pay HMRL-361	$ 571,093
7.	Full statistical operating costs all active Naval Vessels while chopped to CTG 7.3	$8,949,443
	TOTAL	$18,868,100

Note: (1) BuShips estimates fiscal year 1959 deactivation, alteration and roll-up costs at $5,000,000.

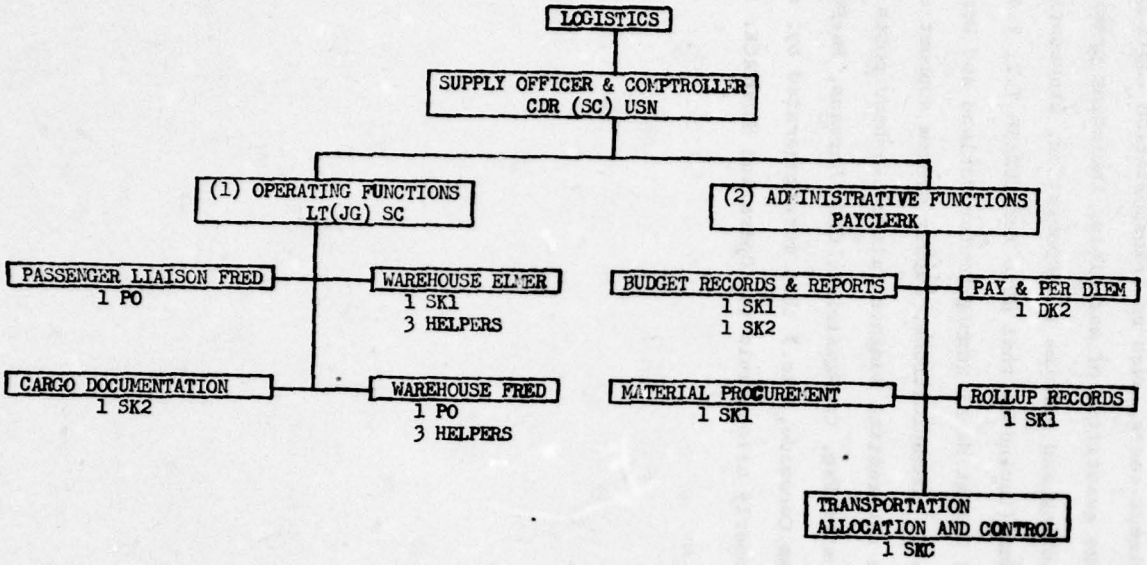
(2) Above figures do not include cost of EC-2 destruction.

[redacted] [redacted]

TABLE V - OPERATION HARDTACK NON-SCIENTIFIC NAVY COSTS: PARTIAL (CONT'D)

(3) Above figures do not include very substantial indirect costs, such as transportation costs on large quantities of materials, including premium handling and premium transportation, stevedoring costs (including that done for CUSATG 7.2, 7.4 and 7.5 at Naval Supply Center Oakland and Pearl, etc.), communications, supply system support costs, and substantial administrative overhead costs (ComServPac, ComNavAirPac, CNO, Bureaus, NavPhib-Base Coronado, etc.) that were generated by, and properly allocatable to, Operation HARDTACK.

TABLE VI - PROPOSED FUNCTIONAL STRUCTURE OF SUPPLY; OPERATING PERIOD



(1) Includes: Shipping and Receiving.
Material Follow-up.
Material Forwarding.
Warehousing Functions.
Cargo Estimating and Booking.
Storage including records and reports.
Control of reefers, provisions deliveries.
Material segregation and delivery.
Small craft requirements (shipping).
Passenger allocations, controls, and bookings.
Vehicle maintenance and control.

(2) Includes: Cost analysis and reports.
Fiscal procedures and control.
General supply correspondence and files.
Budgeting and reporting.
Pay records and schedules.
Supervision rollup correspondence and records.
Material procurement and follow-up.
Equipment accountability, records and reports.

SECTION 5

COMMUNICATIONS

5.1 GENERAL

The mission of the Communication Section was to provide reliable, secure, and fast communications to the Task Group Commander and to the Task Group ashore and afloat; further to supply communication services to embarked elements of other Task Force Commands.

In the initial planning stage of the Operation, the Communication Officer was required to work in close coordination with fellow Staff officers to determine individual and overall requirements. Liaison with communication personnel of other task groups and the Task Force was necessary in determining requirements, procurement, and installation.

5.2 MATERIAL

Large amounts of equipment were borrowed from BuShips, USAF, and the Army Signal Corps to increase the capabilities of the flagship and to establish the communication center ashore. Close liaison with Code 881 of BuShips was required. All equipment was ordered six months prior to the scheduled commencement of the Operation. The various items were then shipped from CONUS to the EPG via MSTS to arrive not later than ten weeks prior to the scheduled commencement of the Operation. Equipment so shipped was marked numerically, COMM-1 through COMM-10, to assist the recipients in the EPG to determine proper location.

5.2.1 SHORE COMMUNICATIONS INSTALLATIONS AND ELECTRONICS

5.2.1.1 CONSTRUCTION

A change in operating concept from that followed in Operation REDWING was that of a Staff split between USS BOXER (CVS-21) and ELMER Island. As a result, a Task Group 7.3 Communication Center was built as a part of the new Task Group 7.3 office spaces in Building 221. Equipment for this Communication Center was obtained on a loan from the Bureau of Ships. The preliminary engineering for inter-connection of equipments and the manufacture of a patch cabinet was done by the Electronics Division of the U.S. Naval Gun Factory.

(5.2.1.1 Cont'd.)

In addition to furnishing the prime equipments, Electronics Supply Office prepared Electronics Material Parts Allowance Lists to support all loaned equipment for 180 days, and various supply activities assembled and shipped these parts to CTG 7.3 in the forward area. These parts were funded by the Bureau of Ships. Preliminary installation work in the Communication Center was commenced by Holmes and Narver communications personnel. Major installation, hookup and test was performed by an advance party of Task Group 7.3 communications personnel. Holmes and Narver installed one long wire receiving antenna, one whip antenna, and one dipole antenna. The major problems connected with this installation were:

a. Late completion of the structure to house the Communications Center.

b. Difficulty in finding equipment which had been shipped out earlier. Components were located in many warehouses, and on several different islands; even on different atolls. The "easter egg hunt" aspect of this job could have been prevented if Task Group 7.3's warehouse had been completed earlier to serve as a collection point, and if an early party of Task Group 7.3 storekeepers had been in the Eniwetok Proving Ground to keep track of incoming material marked for Task Group 7.3.

c. The late completion of the island telephone system delayed the in-use date of the Communication Center. Specifically, sufficient telephone pairs with protective devices were not initially available for keying lines, audio lines, and control lines between the Communication Center and the Navy transmitters installed on FRED Island.

5.2.1.2 TRANSMITTERS

To provide sufficient transmitters to handle planned Navy circuits, four AN/SRT-14 and three AN/SRT-15 transmitters were installed in the Joint Transmitter Site, Building 4, FRED. This required erection of new antennas and feed lines. The final completion of this installation was delayed awaiting receipt of antenna baluns, coaxial connectors, and an antenna patch panel. Upon receipt and installation of all items, this facility operated in a very satisfactory manner.

[redacted]

5.2.1.3 SOPA COMMUNICATIONS

To support SOPA (Admin) Bikini certain communication equipments were installed by Holmes and Narver in the Port Facilities Building, located on the seaward side of Camp Blandy. Equipments installed were TED-AN/URR-13, AN/SRC-15(Y), and TCS for Primary Tactical/Administrative Net, Boat Pool Net, and Harbor Common (Voice).

5.2.1.4 MARINE HELICOPTER UNIT

For control of Marine helicopter operations at NAN, TED-AN/URR-13 equipments were installed and maintained by Holmes and Narver.

5.2.1.5 TELEVISION STATION

CTG 7.3 operated a television broadcasting station on NAN during Operation HARDTACK. This station was installed in a trailer van obtained at no cost from the U.S. Army Major Items Supply Management Agency, at Letterkenny Ordnance Depot, Chambersburg, Pennsylvania. The television equipment was provided by the Office of Armed Forces Information and Education (OAFIE), and was the same as that provided for installation in USS BADOENG STRAIT (CVS-116) during Operation REDWING. During the interim period the equipment was overhauled at the Dage Plant, Michigan City, Indiana. It was installed by the Dage Plant in the trailer van during December 1957 - January 1958. Air conditioning and trailer preparation was funded by a grant from the Bureau of Naval Personnel. The engineering, planning and installation of equipment was funded by CJTF SEVEN. Two Staff ETs participated in this installation and later operated the equipment in the EPG. Earlier training for the operators consisted of an indoctrination period at Station WTOP in Washington, D.C. Upon completion of the trailer installation, it was towed cross-country and lifted by USS BOXER to Bikini. The beginning of broadcasting schedules was delayed due to lack of power supply from the island utility system. Film programs were routed to Bikini from OAFIE Armed Forces Television Station, Eniwetok and a continuous ample supply was available. Coverage of the NAN anchorage and the island of NAN was good. Quality of the transmitted program was excellent. The van air conditioner motors required rewinding on two occasions, but since there were three independent units, this was not a serious casualty.

[redacted]

5.2.1.6 AMATEUR RADIO STATION

A Ham radio station was established at Camp Blandy on NAN Island, and some needed equipment was provided to the EG&G Station in the administrative compound on ELMER. The EG&G station was made available to Task Group 7.3 badged personnel. More than 4000 personal telephone "patches" were made during the Operation. For the station at Camp Blandy, the following equipment was obtained on loan from the Chief of Naval Operations (Op-302J).

a. Transmitter, type AN/URT-17.

b. Receiver, type R-390-A.

c. Beam Antenna, type 10-15-20 meter, 3 element, HY-gain.

For the station at ELMER the following equipment was obtained from the Hallicrafter Company:

a. Transmitter SSB Generator, type HT-32 Hallicrafter.

b. Amplifier, type HT-33 Hallicrafter.

c. Receiver, type SX101 Hallicrafter.

d. Beam Antenna, type 10-15-20 meter, 3 element, HY-gain.

5.2.2 SHIPBOARD COMMUNICATIONS INSTALLATIONS

Major additions to the communications and electronics systems aboard the USS BOXER and the USNS FRED C. AINSWORTH were made in West Coast shipyards prior to the Operation, as outlined below.

5.2.2.1 USS BOXER

a. Four RCA radio transceivers with ten remote consoles for Task Group 7.1 use on the following nets:

(1) Channel 1 - Radiological Safety.

(2) Channel 2 - Task Group 7.1 Command.

(3) Channel 3 - Task Unit 2.

(4) Channel 4 - Task Group 7.1 Administrative.

b. Inter-communication system between Sandia "N" trailer, EG&G control room, CIC, Project 1.10 trailer, and Flag Plot.

c. Ship's service telephone to four trailers.

d. Power to four trailers.

e. Single Side Band radio systems, including two AN/GRA-32 and associated components.

[redacted]

(5.2.2 Cont'd.)

f. Two ship-shore radio telephone systems, AN/TRC-35, including telephone terminals AN/TRC-3, and telegraph terminals AN/TCC-20, and ciphony equipments TSEC/KY-5.

g. Addition of two trunk lines to telephone switchboard.

h. Manufacture and installation of tripod mast on forward starboard side of flight deck to support directional antenna array, UHF/DF antenna, RCA transceiver antennas and AN/TRC equipment antennas.

i. Installation of supplementary mast to support receiving long wire antennas.

j. Installation of 60 foot whip antenna for single sideband transmitter.

k. Installation of two 35 foot whip antennas for single sideband receivers.

l. Installation of four AN/GRC-27 UHF radio transceivers, complete.

m. Installation of six AN/SRT-15 HF radio transmitters.

n. Installation of two AN/ARC-1 VHF radio transceivers.

o. Installation of three AN/SRC-15 VHF radio transceivers.

p. Teletype equipments:

(1) AN/FGC-9 (Mod 19) each 2.

(2) AN/FGC-13 (Mod 15) each 3.

(3) TT/45-FG (Mod 14) each 2.

(4) AN/FGC-12 (Mod 14) each 3.

q. Installation of eight R-390A radio receivers.

r. Installation of three frequency shift converter comparators AN/URA-8A.

s. Installation of one frequency shift converter CV-60/URR.

t. Manufacture and installation of a communications switching system in Combat Information Center (CIC) for evaluator and controllers.

u. Installation of IFF controls on VK and AN/SPS-9 radar scopes in Combat Information Center (CIC).

[redacted]

[redacted] [redacted]

5.2.2.2 USNS FRED C. AINSWORTH (T-AP 181)

a. Installation in the Communication Center (Children's Playroom) of a 25 line automatic electric telephone switchboard.

b. Installation of telephone lines and instruments in twenty-eight spaces.

c. Installation of antennas, antenna and power cabling and control lines for three AN/VRC-18 radio equipments.

d. Install in radar equipment room the following equipment:

(1) AN/TRC-35 - each 1.

(2) AN/TCC-3 - each 2.

(3) AN/TCC-20 - each 2.

e. Furnish and install air conditioning to radar equipment room. Insulate complete space.

f. Fabricate and install foundations for five RCA transceivers in radar equipment room. Install five antennas, antenna and power cabling as required.

g. Install three voice channels from telephone attendant's cabinet to AN/TCC-3 equipment.

h. Install microphone control cabinet to ship's public address system in Communication Center.

i. Install one full duplex ship-to-shore teletype circuit consisting of:

(1) AN/FGC-9 - each 1.

(2) AN/FGC-10 - each 1.

(3) TT-103/FG - each 1.

j. Install necessary teletype lines connecting these lines with AN/TCC-20 in radar equipment room.

k. Install off-line crypto facility consisting of:

(1) AN/FGC-9 - each 1.

(2) TT/103/FG - each 1.

(3) AFSAM-399/A - each 1.

l. Install following Task Group 7.3 communications equipment:

(1) TED UHF transmitter - each 1.

[redacted] [redacted]

[redacted]

(5.2.2.2 Cont'd.)

(2) AN/URR-35 UHF receiver - each 2.

(3) AN/SRC-15Y transceiver -each 1.

(4) CV/60-URR frequency shift converter - each 1.

(5) TT-48A/UG teletype page printer - each 1.

(6) TBL-12 transmitter - each 1.

5.2.3 ANTENNAS

5.2.3.1 TWIN SIDEBAND RECEIVER

Previous operations indicated a need for a tuned antenna for the twin sideband receiver. No suitable system was available from military or civilian sources. Components of Tuning Unit BC-939 and Remote Tuning Group AN/ARA-19 were assembled to satisfy the requirement for an antenna tuner and its remote control system. When the tuner was properly adjusted, antenna performance was improved considerably over an untuned antenna. The remote control system, however, was generally unsatisfactory, due to excessive drag in the tuner.

5.2.3.2 TWIN SIDEBAND TRANSMITTER

The antenna for the twin sideband transmitter represented a compromise between optimum radiation efficiency and physical limitation. The original specifications called for an 85 foot tower and whip combination, tuned by Antenna Tuning Group AN/SRA-18. Mechanical problems dictated that the antenna length be reduced to 60 feet, consisting of a standard 35 foot whip mounted on top of a 25 foot section of five inch steel pipe, guyed and insulated from the deck.

At the frequencies to be used, it was felt that the shorter antenna would create voltages beyond the limits of the AN/SRA-18; therefore a service test model of a tuning group manufactured by the Technical Material Corporation was procured and installed by Long Beach Naval Shipyard. This system promptly burned out, and it was later discovered that it was designed for use in 70-Ohm feed systems, and specifically for a 35 foot whip.

As little time remained, the Navy Electronics Laboratory at San Diego designed a lumped - constant loading and coupling coil, with a manually operated switch, which worked successfully throughout the Operation, with very

[redacted]

(5.2.3.2 Cont'd.)

little attention. Overall radiation efficiency was of the order of 25% which, while not as good as desired, was sufficient for the purpose.

5.2.3.3 AN/TRC-35 ANTENNA (USS BOXER)

Original plans for the AN/TRC-35 radio system provided omni-directional antennas of the "discone" type used in previous operations. A late operational requirement arose for deployment beyond the range of the discone antennas. No suitable antenna system could be found either in military or commercial stocks, although components used for similar purposes were available. A selection of such components were requisitioned and placed aboard the USS BOXER to be assembled into a system when time permitted. Long Beach Shipyard personnel devised a "hay-wire" assembly to demonstrate the practicability of the technique. USS BOXER personnel, over a period of months, worked to to assemble the system and to overcome the difficulties inherent in the make-shift character of the installation. By Johnston Island phase of the Operation, the system had been improved to the point that it worked essentially as intended.

5.2.3.4 AN/TRC-35 ANTENNA (USNS FRED C. AINSWORTH)

A high gain rotating antenna, controlled by a UHF Direction Finder and a multicoupler were supplied to the USNS FRED C. AINSWORTH for use with the AN/TRC-35 ship-to-shore equipment. This was a duplicate of the installation used in the USS BOXER and similar difficulties were experienced.

5.2.4 USS BOXER ELECTRONIC PROBLEMS

a. In March the antennas (AT-197/GR) installed on the flight deck tripod mast crossarm proved to be inaccessible for maintenance so that an access platform was built and installed by ship's force.

b. Because ambient temperatures in KY-5 room were about 20° higher than the maximum designed temperature limits of the equipment, two one horsepower room type air conditioners were ordered to be installed by the ship's force. Even though these air conditioners were not received in time for installation during the Operation, performance of the KY-5 equipment was adequate.

[redacted]

(5.2.4 Cont'd)

c. On 16 April 1958 RF plumbing in AN/SPS-6b radar was damaged beyond repair by arcing. Temporary repairs were made in 48 hours to provide the IFF function. Emergency requisitions for replacements parts were submitted and the radar was fully operable on 3 May 1958.

5.3 OPERATIONAL COMMUNICATIONS

5.3.1 FREQUENCIES

The Task Group frequency requirements for Operation HARDTACK were determined during the planning phase. Frequencies required were requested from and supplied by CJTF SEVEN. Frequencies required were not all received prior to the distribution of CTG 7.3 Operation Order 1-58 but were received in time for the Operation.

5.3.1.1 HARBOR COMMON

2836 KC caused interference with the radio station at Kwajalein and its use was discontinued. This did not hamper operations as it was found that this circuit (harbor CW common) was not needed.

5.3.1.2 TASK GROUP BROADCAST

The Task Group Broadcast experienced interference and fading at distant stations, particularly weather stations, during night hours. The Task Group CW net was used to deliver traffic during these periods.

5.3.1.3 CI NET

Two frequencies were provided for the CI net. One would have sufficed. However, the additional frequency was from time to time used as an alternate for the Primary Tactical. Since the Primary Tactical caused interference to certain scientific projects, it was desirable to have an alternate available.

5.3.2 TACTICAL AND ADMINISTRATIVE COMMUNICATIONS

Tactical and administrative communication in the UHF range was excellent and reliable. Circuit discipline was poor during the early phases of the Operation. The HF voice frequency was less successful due to interference at long ranges (greater than 20 miles) at night. However, the HF CW circuit was useful and reliable in passing operational and administrative traffic.

[redacted]

[redacted]

5.3.3 VISUAL COMMUNICATIONS

Visual communications was not extensively used since there were no shore signal towers at Eniwetok or Bikini and the smaller ships and MSTS ships lacked personnel for standing visual watches. However, since there was unused capacity on Channel 4, the task group broadcast, there was no real need for visual communication.

5.3.4 FLAGSHIP COMMUNICATIONS

Flagship communications were satisfactory for CTG 7.3 as well as CJTF SEVEN and other task groups when embarked. As the ship-to-shore relay for Task Group 7.3, the flagship efficiently relayed all traffic. The ship's routing system was retained without necessitating any major changes. The physical location of the communications spaces was unsuitable, and caused problems in processing the very high volume of traffic. Communication personnel maintained continuous watches in seven spaces simultaneously. This resulted in very severe control problems as the CWO and supervisor were physically separated from operators.

5.3.4.1 COMMUNICATION OFFICER

The flagship communication officer was relieved during the period the ship was in shipyard availability for the installation of communication equipment.

5.3.5 TELEPHONE SWITCHBOARD

A four-trunk switchboard aboard USS BOXER was used to handle one voice channel of the sideband and two voice channels of AN/TRC-24. In addition, one channel of AN/TRC-24 direct to Station 70 passed through the switchboard. The physical installation was satisfactory, but service was never satisfactory because of personnel. Because of a shortage of qualified personnel, Marines were assigned as switchboard operators in addition to their regular duties. Frequent rotation of duty assignments prevented most of the operators from becoming fully qualified. Provision should be made for permanent operators.

5.3.6 AEROLOGY COMMUNICATIONS

The flagship had direct teletype and facsimile communications with JTF SEVEN Weather Central, Eniwetok. Primary link was via the sideband

[redacted]

[redacted]

(5.3.6 Cont'd.)

with an alternate over the AN/TRC-24 and Tropospheric Scatter System. Facsimile was generally satisfactory but night reception was poor.

5.3.7 ACAN COMMUNICATIONS

The flagship and PARRY Communication Center were made tributory stations of the Army Command and Administration Net (corresponding to Navy NTX). This provided rapid teletype communications into and out of the EPG. Routing indicators were made effective prior to the time the system was turned to traffic.

5.4 PERSONNEL

5.4.1 FLAGSHIP RADIOMEN

Flagship communication personnel problems were anticipated. A number of personnel, by rate, to man the flagship was evolved. CNO and BUPERS met this requirement by increasing the Staff allowance rather than the BOXER allowance. Prior to departure for the EPG, the flagship received the top 25 men who had just completed the Radioman Class "A" School. This (numerically) filled the new Staff allowance. The Type Commander had previously numerically filled the flagship allowance. The number of personnel was adequate.

5.4.2 FLAGSHIP ELECTRONICS TECHNICIAN MATES

The flagship was short of electronic technicians mates and those aboard were not familiar with much of the specially installed equipment.

5.4.3 OTHER SHIPS RADIOMEN

All of the smaller ships of the task group arrived in the EPG with a minimum number of communication personnel. This necessitated a continuous watch system with no allowance for sickness, emergency leave, etc. For this reason it was necessary to employ operators who were not fully qualified which in turn lowered the circuit discipline and efficiency.

5.4.4 PARRY COMMUNICATION CENTER PERSONNEL

Enlisted personnel assigned to the Task Group 7.3 Communication Center, PARRY Island were drawn from radiomen assigned to Task Group 7.3 Boat Pool and Detachment, Special Projects Unit, Decontamination Unit, and Headquarters allowances. Personnel allowance was originally planned at two officers and twenty-three men. The tempo of the Operation and amount of traffic handled

[redacted]

[redacted]

(5.4.4 Cont'd.)

necessitated augmentation with an additional eight radiomen from the flagship. Three Chief Radiomen were used as Communication Watch Officers. Three men were assigned to Joint Crypto Center. The majority of the radiomen assigned were newly graduated from Class "A" School or of limited experience. This inexperience limited the capabilities of the Communication Center during the early phase of the Operation. However, intensive on-the-job training enabled the Communication Center soon to exceed its planned capacity.

5.5 REGISTERED PUBLICATIONS AND CRYPTO

5.5.1 CTG 7.3 ALLOWANCE

a. USS BOXER. CTG 7.3 was authorized a modified Class 5 cryptographic allowance including a CSP 3000 and associated devices. This allowance was used in the Crypto Center aboard BOXER. Equipment saturation was never reached although the number of devices available assured rapid handling of classified traffic.

b. Ashore. Ashore at PARRY Island the CTG 7.3 Communication Center utilized the services of the Joint Crypto Center established by CJTF-7. This Crypto Center held Class 5 Navy crypto devices.

Non cryptographic publications held in the BOXER allowance proved adequate for Staff needs.

5.5.2 TASK GROUP ALLOWANCE

All units of the Task Group with the exception of civilian manned ships were increased to a Class 3 Afloat allowance including a machine (KL-47).

5.5.3 DELIVERY

The Registered Publication Issuing Office, Pearl provided ROB publications by courier flight into the EPG.

5.5.4 CIPHONY (KY-5)

5.5.4.1 CIPHONY EQUIPMENT

The Ciphony (KY-5) equipment was obtained by CJTF-7 on loan from the National Security Agency. The equipment was installed in the BOXER in San Diego with assistance of a Motorola engineer and by the ETs assigned to operate the equipment. The system operated as a secure radio telephone link between BOXER and various shore command posts. Since BOXER was programmed to operate

[redacted]

[redacted]T

(5.5.4.1 Cont'd)

primarily from Bikini, no requirement existed for a shore terminal at Eniwetok; hence when BOXER was in the Eniwetok area the Ciphony was not used. During shots requiring evacuation of Bikini lagoon, two electronic patches were made at the Bikini Ciphony terminal to patch the firing bunker Bikini, and BOXER, and CJTF-7 Command Post and BOXER together.

5.5.4.2 CIPHONY PERSONNEL

Four Navy ETs were assigned, at the request of CJTF-7, to attend KY-5 school for the operational maintenance of ciphony equipment. This instruction was given by Motorola Corporation, Chicago, Illinois. Due to time involved these men started school prior to receipt of final security clearance. At a later date, one man was temporarily relieved pending clarification of his clearance.

5.6 RADIO AND TELEVISION STATIONS (MORALE)

5.6.1 AMATEUR RADIO STATION

An amateur radio station was installed at Bikini under the direction of SOPA (Admin). A radioman with an amateur radio operator's license was assigned to operate and maintain the station. Licensed amateurs from forces present also operated the station under the club license. The use of the station for phone calls to dependents contributed greatly to the morale of forces. Over 1000 phone patches were made. The equipment was in operation on single sideband approximately 608 hours and on AM approximately 20 hours.

5.6.2 TELEVISION STATION

The television station operated at Camp Blandy, Bikini. An ETC and an ET2 were ordered to the Staff six months prior to the commencement of Operation HARDTACK to operate and maintain the equipment. Neither man had had previous experience in the field. With the assistance of OAFIE arrangements were made for them to observe operations of a commercial television station prior to proceeding to Dage Television Corporation. Three months were spent at WTOP-TV, Washington, D.C., observing all facets of operation including mobile. This was followed by a one month period at the Dage Television Corporation observing the installation and operation of the equipment in the trailer. After arrival in the EPG the station operated originally from 1730 to 2300 daily. Hours were

[redacted]

(5.6.2 Cont'd.)

changed to 1600 to 2200 daily in order to provide entertainment during the period from knock-off work until taps. Operation ceased 16 July after a period of 20,000 scheduled minutes of air time with a loss of only 80 minutes due to equipment failure.

5.6.3 RADIO BROADCAST STATION

Although original plans called for BOXER to re-broadcast the AFRS broadcast originating in Kwajalein, the equipment in BOXER would not have provided sufficient fidelity. Therefore a broadcast was originated from BOXER. The combination of frequency (730 KC), power output limitations (50 watts antenna input) and available transmitter (AN/SRT-14) resulted in numerous transmitter failures due to attempts to operate the transmitter at power output significantly lower than designed. Upon request, CJTF-7 allocated a new frequency until such time as a new transmitter could be obtained. The frequency provided (1550 KC) was unfortunately subject to a good deal of interference. The Philco and Collins technical representatives worked in conjunction with the flagship personnel to provide a modification of the transmitter. After successful testing of the modification, broadcast on 730 KCS was resumed.

5.7 TRAFFIC ANALYSIS

Traffic volume was greater than expected. Less than five percent of all traffic was classified. More than one third of all traffic was of greater than routine precedence. The Communication Center ashore handled approximately 70% more traffic than had been planned. Because of this, space became critical although communication channels never became overloaded.

UNIT	MAXIMUM DAILY AVERAGE MESSAGES HANDLED
BOXER Comm Center	414
TG 7.3 Comm Center PARRY	284
Typical destroyer	30
Typical ATF	20 or less
SOPA (Admin) Bikini	11

5.8 BOAT POOL COMMUNICATIONS

All small craft assigned to the Task Group 7.3 Boat Pool and

(5.8 Cont'd.)

Detachment were equipped with AN/VRD-10 or AN/VRC-12 transceivers operated off six volt batteries. These multi-channel voice radios were ideal for their assigned use. The equipment was obtained on loan from the Army Signal Corps. It was extremely rugged and reliable, operating with a minimum of failures.

5.9 MOVEMENT TO THE FORWARD AREA

The Assistant Communication Officer, who was to be in charge of the Communication Center, ELMER, deployed with a nucleus of personnel in late January. Upon arrival in the EPG, it was found that construction of the Task Group 7.3 Communication Center of Building 221 was not completed. The Communication Center was without electricity, soundproofing, and power outlets. Equipment was scattered throughout Task Group 7.2 warehouses, site FRED, and Task Group 7.5 warehouses at site ELMER. The equipments were assembled and moved into Building 221, a process which took approximately two weeks. Wiring and installation was accomplished by the advance echelon with the assistance of Holmes and Narver. Delays were further caused by a lack of necessary materials and parts to complete installation. The arrival of the flagship in early March found the Communication Center only partially operable. The keying lines to the transmitter site were inoperative. The FCC equipment was unable to operate during this period because of a lack of air conditioning equipments. Arrival of these equipments allowed the Communication Center to become fully operative in the latter part of March.

5.10 TASK GROUP BROADCAST

The Task Group broadcast was operated (60 WPM teletype) on two frequencies simultaneously, a third frequency was held in standby for use during periods of interference and poor reception. The broadcast enabled all units of the Task Group to be reached by a single transmission. The broadcast covered both the Eniwetok and Bikini areas. All the operating ships were equipped with teletype for this purpose during the planning phase of the Operation. Traffic originated by the flagship, to the Task Group, was sent to the Communication Center for relay on the broadcast. High precedence traffic was relayed to the entire Task Group in less than three minutes from the time it was sent from the flagship. Interference was experienced at Bikini and by the destroyers on

(5.10 Cont'd.)

weather stations between 2000 and 0200 nightly. Alternate means of delivery were used during these periods to ensure receipt of traffic (CW delivery on Tactical/Admin Net).

5.11 FLEET BROADCAST

The Communication Center was designated to guard the "HR" fleet broadcast for all the small ships assigned to the Task Group. This service was also available to the larger units upon request. All traffic addressed to units, for whom the Communication Center had the guard, was relayed on the Task Group broadcast. Complete schedules were reproduced and distributed daily through guard mail.

5.12 VOICE COUNTDOWN

CJTF SEVEN arranged to have Task Group 7.1 broadcast the voice countdown on the UHF distress frequency (243 MC). Ships received the broadcast on Channel 24 (243 MC). CTG 7.3 published an instruction including a script to insure that pertinent safety information would be broadcast over each ship's public address system. During the YUCCA shot countdown was originated at sea in the EG&G timing and firing room aboard BOXER. For the benefit of Navy ships, the SOPA (Admin) in each location re-broadcast the voice countdown on the Primary Tactical Net (277.8 MC).

5.13 CONCLUSIONS

1. That the Communication Plan and Organization were adequate to meet all requirements.

2. That a schedule of planning be prepared to include personnel training and movement to the EPG.

3. That a system be derived for accountability and receipt of communication equipment shipped to the EPG.

4. That reports on construction in the EPG did not reflect progress on installation of communication equipment.

5. That the number of channels in the Communication Annex of CTG 7.3 Operation Order 1-58 were adequate.

6. That the space allocated in the Communication Center, Eniwetok was not adequate to permit command use.

(5.13 Cont'd.)

7. That a visual signalling capability ashore at Eniwetok and Bikini is not necessary for an operation of this size unless the number of large ships present warrant the implementation.

8. That the flagship communication spaces were not suitable for this type of operation. That the division of communication spaces did not provide adequate supervision of watch personnel.

9. Aerological communication facilities were in general adequate. However, where telephone service was limited, as when BENNER was reporting weather from Bikini, facilities were overloaded.

10. That the ACAN system was the most reliable and expeditious means of handling traffic into and out of the EPG both ashore and aboard the flagship.

11. That the late reporting date of communication personnel to the flagship allowed no time for advance training prior to arrival in the EPG.

12. That the crypto allowance and equipment ashore and aboard the flagship were satisfactory to meet all requirements.

13. That the mail and courier service for delivering Registered Publication System material and basegrams was adequate to meet the needs of the Task Group and Staff.

14. That the assignment of a field engineer was necessary to direct maintenance and operation of sideband (Collins) equipment installed on the flagship.

15. That the Ciphony (KY-5) was adaptable for shipboard use with the AN/TRC-24. That assignment of personnel with interim vice final clearances for Ciphony training was unavoidable at the time.

16. That the television trailer was an asset in aiding morale both afloat and ashore at Bikini. That the equipment functioned well throughout the Operation, and van installation of the equipment proved satisfactory and economical.

17. That the Armed Forces Radio broadcast was not as successful as planned because of movements of the flagship and troubles with the transmitter.

(5.13 Cont'd.)

18. That the establishment of an Amateur Radio Station ashore at Bikini was highly successful and a great aid to morale.

19. That the traffic handling capacity of the flagship be 350 messages a day. That the Communication Center, Eniwetok be capable of handling 250 messages per day.

20. That Boat Pool communication equipment was excellent and well suited for the assigned tasks.

21. That the deployment of personnel to the Communication Center at Eniwetok two months prior to the commencement of the Operation was of great advantage.

22. That the Task Group broadcast was successful.

23. That the assumption of fleet broadcast guard by the Communication Center was of great value to the smaller (ATF) ships of the Task Group.

24. That the voice countdown was successfully received by all ships of the Task Group.

25. Attempts to satisfy unusual requirements, through assembling non-standard components designed for other uses, were only partially successful, and were seriously hindered by the lack of time available for experimenting and design. The problems associated with the directional AN/TRC-35 antennas on the USS BOXER clearly demonstrate this point.

26. Interference to Navy frequencies was at times caused by frequencies used in scientific projects. This was particularly true of interference to the Fleet Common (277.8 KCS).

27. That Philco engineers should be employed in future operations.

5.14 RECOMMENDATIONS

1. That a similar Communication Plan and organization be developed for future operations.

2. That the Communication Section prepare a calendar schedule for ordering equipment, deployment of personnel and training.

3. That communication equipment be shipped to the EPG on a receipt and accountability basis to the AEC communication representative. Further that advance copies of shipping papers be furrished to aid in tracing missing equipment.

(5.14 Cont'd.)

4. That the AEC communication representative in the EPG make a monthly report on the progress in installation of communication equipment.

5. That frequencies be assigned as early as possible to allow dissemination to the ships of the Task Group. That extra frequencies not be assigned but held until needed. This would allow room for substitution of frequencies when found to be subject to high interference.

6. That a Command Post be constructed and located adjacent to the Communication Center to provide duplicate use of equipment, antennas, and other installed facilities. That this space be provided with necessary facilities for control of all tactical and administrative channels.

7. That the tactical and administrative channels be located in the CTG 7.3 Command Post rather than in the Communication Center, Eniwetok. This would provide better command control on these channels.

8. That the tactical and administrative UHF voice and HF CW channels be retained. That emission on the long range voice channel be single sideband on a frequency compatible for use with equipment presently installed on destroyer types. This would provide positive command control of patrol and weather ships at all times.

9. That the location of communication spaces and facilities be considered in the assignment of a flagship so that operation and control of communications can be suitably handled by a limited number of supervisory personnel.

10. That similar aerological facilities and equipment be used in future operations.

11. That both the flagship and Communication Center ashore should be in the ACAN system.

12. That communication personnel be ordered to the flagship a minimum of two months prior to the commencement of future operations. This would allow a sufficient period for training and familiarization with installed special equipment.

13. That similar crypto allowances and equipment be used ashore and aboard the flagship in future operations.

[redacted]T

(5.14 Cont'd.)

14. That in future operations arrangements be made with U.S. Naval Communication Station, Pearl Harbor for similar mail and courier delivery of RPS material and basegrams.

15. That channelization of sideband equipment be determined prior to the arrival of the flagship in the EPG.

16. That Collins twin sideband be installed on the flagship in future operations and a field engineer again be assigned to aid in the maintenance and operation of this equipment.

17. That similar ciphony equipment and facilities be installed aboard the flagship. That the Command Post at Eniwetok be provided with an extension of the equipment ashore to provide facilities for rapid classified transmission and coordination between the two elements of the Staff.

18. That final security clearances of personnel be obtained prior to assignment for training in the operation and maintenance of ciphony equipment.

19. That the television trailer be returned to provide the same broadcast facilities at Bikini in future operations. It is recommended that the personnel to run this trailer be ordered to the Staff four months prior to the commencement of the operation to provide a sufficient period for training.

20. That a more suitable transmitter be provided capable of continuous operation on 730 KCS with a 50-watt output for the Armed Forces Radio Station. That this equipment be located ashore at Bikini instead of aboard the flagship in future operations. That personnel allowance of the Task Group 7.3 Boat Pool be increased to provide operators for this station.

21. That similar single sideband equipment be obtained to provide amateur radio facilities ashore at Bikini. Two sets of equipment should be provided.

22. That the same type of communication equipment be used by the Boat Pool and be used in the same manner on future operations.

23. That a nucleus of personnel be deployed to the Communication Center, Eniwetok two months prior to commencement of operations. This group should supervise final installations and testing of all equipment installed.

[redacted]

[redacted]

[redacted]

(5.14 Cont'd.)

That the remainder of the personnel for this station deploy one month prior to the operation to provide the necessary familiarization with the equipment, mission and operating procedures to be employed.

24. That the communication facilities of the flagship be sufficient to handle an average of 350 messages per day. That the facilities of the Communication Center, Eniwetok be expanded to provide less crowded facilities to handle an average of 250 messages per day.

25. That all ships assigned to the Task Group be RATT equipped to receive the Task Group broadcast. That the Task Group broadcast be continued and assigned one medium frequency to provide better long range reception at night.

26. That in any future operation the Communication Center, Eniwetok guard the fleet broadcast for all ATFs and smaller ships. All action traffic for these ships should be relayed on the Task Group broadcast and complete schedules disseminated by guard mail.

27. That voice countdown be provided to all Task Group ships. It is recommended that the same frequency (243.0 MCS) be used. Further, that all ships receive a similar voice countdown script to be broadcast on the general announcing (1 MC) system.

28. That unless there are to be more large type ships than were present for HARDTACK, no facilities for visual communications be constructed ashore. Unless commensurate traffic capacity is added the expense in construction and personnel is not warranted.

29. Assign scientific projects frequencies that do not cause interference to established Navy frequencies.

30. Employ Philco field engineers in future operations.

[redacted] [redacted]

SECTION 6

TECHNICAL ASSISTANCE TO TARGET ARRAY SHIPS

6.1 GENERAL

6.1.1 MISSIONS

The following missions were assigned:

6.1.1.1 PROVIDE SERVICES FOR THE TARGET ARRAY SHIPS

Services for the target array ships were normally provided by USS HOOPER ISLAND (ARG-17), in addition to her acting as a repair ship. The Destroyers and USS BONITA (SSK-3) were nested alongside. Since the EC-2 was not an operating target, it required only electric power, which was supplied by a 60KW diesel generator on board.

6.1.1.2 COLLECT SCIENTIFIC DATA AS DIRECTED

CTG 7.3 was directed to collect certain sonar data in connection with an operational training exercise conducted during WAHOO. Details are contained in CTG 7.3 Secret letter *Serial 0075 of 6 July 1958*.

6.1.1.3 ASSIST, AS REQUESTED, IN INSTALLATION OF INSTRUMENTATION

The major portion of the instrumentation had been installed in the Long Beach Naval Shipyard, prior to tow, but a certain amount of assistance was required in the EPG. This consisted of such things as minor wiring, fabrication of simple instrument mounts, welding, burning, and the like. This was taken care of by ship's force, and in some cases by the USS HOOPER ISLAND (ARG-17).

6.1.1.4 PROVIDE ASSISTANCE IN COORDINATION WITH CTG 7.1 IN DATA COLLECTION

Some difficulties were encountered. An unstated but tacitly understood mission was to assist in the attainment of the scientific objectives of the two underwater shots, WAHOO and UMBRELLA. This unfortunately was not an unqualified success. On WAHOO no EG&G timing signals were received on either DD-474 or DD-592, which resulted in an almost complete lack of records on these two ships. Nevertheless, the principal objective of the underwater shots was to get delivery information on the ASROC and ASTOR weapons. This was met. Full instrument coverage was secured on both shots, with the exceptions mentioned above.

(6.1.1.4 Cont'd.)

The timing failure led to a procedure which should be followed in subsequent operations. It was determined that the EG&G equipment had two identical radios in parallel, either one of which was sufficient to activate the timing signal relays. Both had taken power from the same source, however. These were divorced. One was then wired to the ship's service (turbo) generator, and the other to the 100KW emergency diesel generator. Unused feeders were employed in both cases. To signal loss of power to the EG&G equipment, a visual tell-tale was devised. This consisted of a pair of plywood shapes hoisted to either yard, where they were held in place by a spring-loaded and solenoid-restrained catch. The solenoids took power from the feeders supplying the EG&G radios, one to the turbo-generator and the other to the diesel generator. Failure of power from either source would result in dropping of the appropriate shape, which were being monitored continuously from observing ships. This installation was installed on all destroyers, the EC-2 and the YFNB, and worked very well. It is described in more detail in the Technical Director's Confidential Memorandum to Officers in Charge, of 5 June 1958, copies of which are available in the Task Group files.

6.2 ORGANIZATION

The initial organization of the technical component of the Staff, CTG 7.3, provided for:

1 Captain, 1400, Technical Director

1 Commander, 1400, Assistant Technical Director

1 Commander, 1730, Scientific Machinery Officer

1 Lieutenant Commander, 1100, Scientific Fiscal Officer.

It was soon determined that the Fiscal Officer was not required, and he was diverted to other duties. The money involved in target preparation was exclusively Ships and Facilities, Navy, which was budgeted for and controlled by the Bureau of Ships. Accounting was done by a civilian clerk, GS-9, of that Bureau; higher-priced help for this job did not appear necessary. In February 1958, the Technical Director retired from the Navy and was relieved by his Assistant; the Staff was thus reduced to two officers. This was considered adequate.

6.3 TARGET PREPARATION

6.3.1 INITIAL PLANNING

Planning for the preparation of the targets (3 destroyers, an EC-2, and a submarine) began in the Bureau of Ships about April 1957. None of the Technical Staff had reported on board at that time, and the Bureau of Ships appointed a 1400 officer as Assistant for Operation HARDTACK as additional duty. This was not a satisfactory arrangement. The officer in question had one full-time job already. There is currently no Code in the Bureau of Ships which could logically assume the task of planning for a nuclear test of diverse scope. There should be, and recommendations to this effect have been made via Bureau of Ships channels. Despite the organizational weakness, however, a Circular of Requirements for the preparation of the destroyers and the merchant ships was hammered out and circulated within the Bureau for comments. A copy was sent to the Long Beach Naval Shipyard, which had been selected to do the work, and their comments worked into the final copy. Few subsequent changes were necessary. The Circular was completed within a few days of the reporting of the Technical Director; in other words, most of the major planning had been completed.

6.3.2 TARGET DESTROYER CREWS

Crews were required for the operation and maintenance of the destroyer plants in the EPG. Their composition conformed essentially to a recommendation made by the Bureau of Ships at the request of CTG 7.3 and consisted of an Officer in Charge, about 25 engineering petty officers, a couple of engineering strikers, and half a dozen deck ratings, mostly seamen. They were provided by the Task Group 7.3 Special Projects Unit, which was based in San Diego. Since the targets were in Long Beach, it was necessary to pay per diem to the engineering force for several months. This was not too expensive, as the crews, except the officer, lived in a barracks in the U. S. Naval Station, Long Beach. Further, the crews could not move their families to Long Beach and were thus subjected to an additional period of separation from their permanent duty station. In retrospect, it is apparent that the crews were too small. For a similar operation, it would be recommended that crews at least twice as large be provided if permitted.

6.3.2.1 SECURITY WATCHES

It was immediately apparent that CTG 7.3 could not accept custody

(6.3.2.1 Cont'd.)

of the targets until the last possible minute; a crew of 33 men could simply not maintain adequate security on a ship the size of a destroyer. It was, therefore, arranged that custody would be retained by the Long Beach Naval Shipyard, and the security patrols would be provided by that Command and paid for by the Bureau of Ships. This cost about $200 per day per ship, or about $135,000 total, for security watches alone.

6.3.2.2 ACTIVATION OF MACHINERY PLANTS

Since the ships were legally in the custody of the Shipyard, and the ships' crews reported to another Command, the crews could not be permitted to do any ship's force work on board. The Shipyard, therefore, activated the machinery plants. This task could easily have been accomplished by the crew, at a considerable saving in cost. No ship's force in the usual sense was available. It is axiomatic that the best assurance of a good overhaul is an alert ship's force. Moreover, this was strictly a non-standard job, and Shipyards not only require, but actually welcome assistance on such jobs. This is not to be construed as a criticism of the Long Beach Naval Shipyard. The work done was excellent, but it is the opinion that a ship's force per se would have reduced the cost somewhat.

6.3.2.3 TRIAL CREWS

The Shipyard was required to provide operating engineers when necessary to run the plants. Long Beach has never been a building yard, and have not found it necessary to build up "trial crews" with actual operating experience. Personnel with this experience are therefore scarce, and the Shipyard had to undergo considerable inconvenience to get together an operating crew.

6.4 CONCLUSIONS

1. That by the time the Technical Director reported for duty, the concept of the Operation was approved, the scientific planning completed, and the major portion of planning for target preparation done. The Technical Director was thus in a position of carrying out plans without a truly complete knowledge of their basis. His job would have been considerably easier had he been aware of the reasons behind a given facet of target preparation. Further, his presence during the planning phase would probably have benefited the Operation.

(6.4 Cont'd.)

2. That the Technical Staff having been given additional duty orders to the Bureau of Ships, where they formed a Code in that Bureau, gave CTG 7.3 direct access to technical assistance in the Bureau, direct control of the funding for the targets, and management control of a sort in the Shipyard. Also, it was found possible to set up a small fund against which Holmes and Narver services in the Eniwetok Proving Ground could be charged; a great convenience.

3. That the Staff in the Bureau consisting of one Marine Engineer, GS-13; one clerk, GS-9; one typist, GS-3; and a Task Group 7.3 yeoman, was considerably short-handed. It was found necessary for the Machinery Officer and the Marine Engineer to spend nearly all their time in Long Beach. While this left quite a load on the one officer remaining, the shortage was most severely felt in the lack of engineering assistance. During the early months of 1958 it was found possible to get more and more assistance from the Bureau of Ships' members of Project 3.8 (Damage Assessment), several of whom hold commissions in the U.S. Naval Reserve, and who have respectable amounts of time as operating engineers. It seems possible that they could have been recalled to active duty for perhaps six months. This would represent a boost in salary for most mid-career engineers, would give them additional retirement credits, and would have been invaluable to CTG 7.3 and to the Bureau of Ships.

4. That in retrospect, it is apparent the target crews were too small.

5. That one of the most irritating of several annoyances experienced in the EPG was concerned with the berthing and messing of target crews. While targets were alongside a repair ship they were messed aboard the ship and berthed on the targets. However, before and after a shot, they had to move to a hotel ship of some kind, and could not berth on the targets for a week or so, due to radioactivity. This required boating for meals at a considerable loss in time and at considerable inconvenience to the hotel ship; it also made the problem of standing engineering watches when plant operation was required by Projects quite difficult. Radiological Safety procedures were necessary before and after target re-entry for several days. Since the Radiological Safety con-

(6.4 Cont'd.)

trol was in the hotel ship; this was not too bad. Unfortunately there was no ready solution to this problem.

6.5 RECOMMENDATIONS

1. That the Technical Director report for duty about 18 months prior to operation.

2. That the arrangement in conclusion 6.4 paragraph 2 be repeated in future operations.

3. That in another operation requiring engineering assistance in quantity from the Bureau of Ships, consideration be given to ordering to active duty a few selected engineers holding USNR commissions. It is suggested that officers with engineering backgrounds might appropriately be Officers in Charge of target ships.

4. That in operations requiring ship activation and shipyard work, a crew of adequate size to maintain security and to do ship's force work be assembled.

SECTION 7

MEDICAL

7.1 GENERAL

7.1.1 ORGANIZATION

The Medical Officers assigned to ships participating in Operation HARDTACK totaled seven (7) including the Staff Medical Officer. Due to the policy of rotating ships engaged in the Operation the total number of Medical Officers present in the Eniwetok Proving Ground at any one time was six (6). The Dental Officers assigned to ships participating in Operation HARDTACK totaled five (5) including the Staff Dental Officer. The total number present at any one time due to the aforementioned rotational policy was four (4). The Staff Medical Officer, a fully qualified surgeon, was located in the Flagship (USS BOXER). The presence of one fully qualified surgeon was adequate to provide for the needs of the Task Group. Surgical facilities were available in BOXER and at the Army Hospital, Site FRED.

Medical Officers present in the Task Group during the Operation possessed qualifications as indicated below:

Surgeon - fully qualified (1)

Surgeon - partially qualified (2)

Flight Surgeon (1)

Diving Medical Officer (1)

General Medicine (2)

Dental Officer (4)

The distribution of Medical Officers was generally satisfactory, but when ships with Medical Officers were obliged to move between atolls an imbalance occurred resulting in hardships for some of the smaller ships, such as tugs, etc. These personnel were forced to spend several hours boating to receive medical treatment and consultations.

The Staff Dental Officer was sent from the USS BOXER to Army Hospital, site FRED, in March to work with the dental services there. He gave dental care to personnel of Task Group 7.3 ashore and afloat at Eniwetok Atoll.

(7.1.1 Cont'd.)

He was transferred in May to Tripler Army Hospital in Honolulu for hospitalization. This resulted in a reduction of on-the-beach Dental treatment. The Army extended the use of their facilities, which proved very satisfactory and was greatly appreciated.

A Diving Medical Officer was assigned and instructions concerning use of new diving tables and various other diving problems were issued. A complete report appears in Section 3.

7.2 ADMINISTRATIVE

The Medical and Dental facilities of the Task Group ships and units were visited early in the Operation in order to meet the medical personnel and hold informal inspections. Facilities visited were adequate and in excellent condition. The Medical and Dental facilities at the Army Hospital, site FRED and the Holmes and Narver dispensaries at sites ELMER and NAN were visited. Arrangements were made with each facility to coordinate with Task Group 7.3 facilities for more adequate care of Task Group 7.3 personnel ashore and afloat. The Holmes and Narver Chief Medical Officer on ELMER was very anxious to cooperate in any way possible. The treatment rendered by his dispensary to the members of the Task Group proved to be invaluable. The Army Hospital, site FRED made its facilities available to Naval personnel of the area requiring hospitalization, in accordance with CJTF SEVEN Standing Operating Procedures 65-3 of 10 October 1956.

A Medical Guard was established at Eniwetok and Bikini on a rotational basis. A Beach Guard of one Hospital Corpsman at Camp Blandy was also provided from ships having the medical guard at Bikini.

Medical supplies were adequate and no difficulty was encountered in procuring them. The larger ships in the Task Group provided the smaller ships and units with any item which was needed in an emergency.

7.3 HEALTH AND SANITATION

A message was sent to all units of the Task Group in February 1958 directing all personnel destined for the Marshall Islands to be immunized against poliomyelitis. This mandatory requirement was based on information received that an outbreak of poliomyelitis had occurred among the native

[redacted]

(7.3 Cont'd.)

Marshallese in the vicinity of Majuro Atoll. The Bureau of Medicine and Surgery, after Tri-service agreement, also promulgated instructions requiring mandatory immunization of all persons travelling to the Marshall Islands under military cognizance. Commander Task Group 7.3 required a letter report indicating compliance with the innoculation program.

Instructions to units of the Task Group regarding precautions against infectious hepatitis were published after reports were received of two cases on one ship, and an indirect report of several cases from the Naval Station, Kwajalein. No new cases were noted thereafter.

Radiation in itself did not present a great hazard as Radiological Safety precautions and instructions were disseminated throughout the Task Group by the Radiological Safety Officer. Instructions for recording exposure to Ionized Radiation in health records are contained in BUMED INSTRUCTION 6150.18.

No serious epidemics or sicknesses occurred during the Operation. There was seemingly a higher incidence of minor injuries than in previous operations but this was due largely to the tremendous scope of the seamanship involved. Only one serious injury occurred which was the severe laceration of the 4th and 5th fingers right hand suffered by a seaman on a tug while checking lines at night. He was evacuated to Tripler Army Hospital, Honolulu for Plastic Surgery.

It was deemed necessary to review all medical evacuations of Naval personnel from the EPG. Commanding Officers in several instances took independent action in providing evacuation to Tripler Army Hospital, Honolulu. Consequently Commander U.S. Army Task Group 7.2 was requested to notify Commander Task Group 7.3 prior to evacuating Naval patients of the Army Hospital, site FRED unless emergency conditions dictated immediate air evacuation.

7.4 CONCLUSIONS

1. That health of the Task Group was excellent.

2. That the numbers of Medical and Dental Officers were adequate to provide for the needs of the Task Group.

3. That the medical facilities and supplies in the forward area were adequate.

[redacted]

[redacted]

(7.4 Cont'd.)

4. That medical evacuation of personnel was carried out with no delay.

5. That sanitary conditions throughout the Task Group were satisfactory.

7.5 RECOMMENDATIONS

1. That a Navy Medical Officer and Dental Officer with at least two corpsmen be assigned to the Base Hospital at Eniwetok.

2. That the 120 day level for medical supplies be made a requirement for the next operation.

3. That a survey of Medical Facilities afloat be made well enough in advance so that the ships having the best facilities available could be designated as mother ships for smaller ships and units.

4. That a board of Medical Examiners be designated by the Staff Medical Officer so that necessary physicals can be given.

5. That the allowance of technicians, i.e., X-ray, Laboratory, etc., be filled 100%.

6. That prior to a subsequent Operation, Commanding Officers of ships and units assigned be advised of the need for rigid adherence to the provisions contained in the Administrative Plan regarding medical conditions considered to be disqualifying for participation in the Operation. Such measures will aid in precluding the possibility of having to evacuate personnel from the Eniwetok Proving Ground after an Operation has commenced.

[redacted] [redacted]DATA

SECTION 8

OPERATION NEWSREEL

8.1 CONCEPT OF OPERATION

The NEWSREEL Phase of HARDTACK consisted of two high altitude detonations of nuclear devices in the megaton range originally scheduled for the EPG. The possible retinal burn hazard associated with these events and the associated political implications caused the DOD and AEC to direct transfer of these two events to Johnston Island. The planning date for the firing of the first of these events was established as 1 August 1958. It was estimated that the Johnston Island operational phase would terminate about 1 September 1958.

Operational control of Johnston Island AFB was assumed by CJTF SEVEN effective 22 April 1958. The Johnston Island Base Command, as an activity of JTF SEVEN, was established on 26 April 1958. The operation and control of Johnston Island by JTF SEVEN was considered in the same relative sense as though it were another location within the EPG. In general, the same division of responsibilities that were applicable in the EPG with respect to the various Task Groups was in force at Johnston Island.

A Liaison Office for Task Group 7.3 was established at Johnston Island early in July 1958 and remained in force until the completion of the NEWSREEL Phase of Operation HARDTACK. Commander Task Group 7.3 remained in constant touch with developments at Johnston Island and exercised overall command. Deputy Commander Task Group 7.3 acted for CTG 7.3 at Johnston Island after 15 July 1958.

8.2 MISSION

The mission of Task Group 7.3 was to provide naval facilities and services, including evacuation capability, in order to assist in the effective accomplishment of atomic tests to be conducted at Johnston Island.

8.2.1 TASKS

The tasks assigned included air surveillance of the danger area, evacuation of personnel on shot day, and post-shot recovery operations of scientific devices floating in the open sea and enumerated below:

[redacted]

(8.2.1 Cont'd.)

Conduct aircraft patrols of the designated danger area to detect, report and warn surface shipping. Be prepared to escort shipping out of the danger area.

Conduct post-shot recovery operations as required to recover floating objects in the open sea for diagnostic and effects measurements.

Be responsible for the safe and proper positioning of attached ships at shot time.

Provide weather information and data from units afloat.

Provide shipboard facilities to accommodate the Joint Task Force and official observers afloat at Johnston Island during each of the two events.

Provide for radiological safety of embarked Task Force personnel during periods the Joint Task Force is afloat.

Provide facilities to support Joint Task Force AOC afloat.

Provide communication services as required by CJTF SEVEN.

Assist Task Group 7.4 in search and rescue operations as required.

8.3 FORCES ASSIGNED

Ships or Units Assigned	Arrived Johnston	Departed Johnston
USS BOXER (CVS-21)	17 Jul 1958	13 Aug 1958
USS BELLE GROVE (LSD-2)	15 Jul 1958	13 Aug 1958
USS DEHAVEN (DD-727)	16 Jul 1958	13 Aug 1958
USS COGSWELL (DD-651)	9 Jul 1958	6 Aug 1958
USS EPPERSON (DD-719)	7 Aug 1958	13 Aug 1958
USS LANSING (DER-388)	13 Jul 1958	13 Aug 1958
USS SAFEGUARD (ARS-25)	28 Jul 1958	13 Aug 1958
USS HITCHITI (ATF-103)	30 Jul 1958	2 Aug 1958
USS TILLAMOOK (ATF-102)	29 Jul 1958	6 Aug 1958
COMFAIRWING TWO and following assigned units:		
VP-1 DET A	3 P2V-5F	
VP(HM)-10 DET A	3 P2V-5F	
VW-1 DET A	2 WV-2	
VW-3 DET A	3 WV-2	

8.4 AIR OPERATIONS

[redacted]

[redacted]

8.4.1 PLANNING

Due to the hazard of retinal burn, a danger area of 40[illegible] miles radius around Johnston Island was established. This area had to be searched with a 100% probability that all non-Task Force surface and aircraft would be clear at time of detonation. Close coordination with COMHAWSEAFRON and Honolulu ATCC had to be established and maintained for both events. To this end, the Hydrographic Office, Washington, D.C., issued HYDROPAC 732/58 ABCD which established the Johnston Island danger area effective 25 July 1958. All surface traffic was to be routed clear of this area, and naval forces transiting within 500 miles of Johnston were directed to Chop to Deputy CTG 7.3 who was exercising immediate operational control of the area. HYDROPAC 732/58 ABCD was published too late to be fully effective. Several merchant ships were found in the danger area that had not been aware of this Notice. Message drops and additional aircraft were required to escort these ships out of the danger area. Fortunately, these ships were discovered early enough and costly delays were avoided.

Surveillance requirements established by CJTF SEVEN called for area search to be conducted on D-2, D-1 and D Day for each event. This task could not be accomplished with the forces available or assigned to CTG 7.3. Consequently, CJTF SEVEN requested CNO to provide additional naval air forces. Following CNO approval of this request, CINCPACFLT directed COMNAVAIRPAC who in turn directed COMFAIRHAWAII to make the additional forces available. The forces finally assigned were placed under COMFAIRWING TWO operational control and included: Two WV-2 aircraft from VW-1; three WV-2 aircraft from VW-2; three P2V-5F aircraft from VP-1; three P2V-5F aircraft from VP(HM)-10; and backup aircraft from VP-22 and VP-28 (already assigned to HARDTACK and diverted from EPG.)

8.4.2 OPERATIONS

On 15 July four P2V-5F aircraft assigned as augmenting forces for VP-28 in the EPG were released from their HARDTACK assignment and returned to their parent squadron, VP-22, at Barbers Point. By 1 August eight P2V-5F aircraft of VP-28 had been returned to Barbers Point. COMFAIRWING TWO with the assigned forces reported to CTG 7.3 and to Deputy CTG 7.3 Johnston Island for operations on 27 July, and was designated CTE 7.3.5.5 for both events.

[redacted]

[redacted]

(8.4.2 Cont'd.)

In order to provide maximum probability of detection and identification, searches were to be completed during daylight hours, and two standby aircraft located at Johnston were available as necessary to conduct surface craft out of the danger area once detected and identified by the search aircraft. In addition, the search area was expanded to a radius of 520 miles to preclude a "tramp" ship entering the danger area for at least 10 hours after completion of the search, assuming an average SOA of 12 knots. It was assumed that all high speed regularly scheduled vessels would have knowledge of the danger area and keep clear.

In order to provide the necessary coverage, backups and escort aircraft within the forces available, it was determined that a maximum of seven search aircraft would be required to stage out of Johnston Island on D-2, D-1 and D Day. All search aircraft would be clear of the danger area by 1800X on D Day.

A special requirement to recover scientific rocket nose cones and a missile pod was established for each event. To meet this requirement two P2V-5F aircraft with previously trained crews from VP-28 were deployed from Kwajalein to Barbers Point, and available to Deputy CTG 7.3 on 22 July. These aircraft, with one crew, remained at Johnston Island during shot time for both events. The crew of the second aircraft evacuated in BOXER.

COMFAIRWING TWO and a partial staff reported aboard the USS BOXER on D-3 days prior to each event. Surveillance flights were directed from the BOXER on D-2, D-1 and D Day for each event.

8.5 SURFACE OPERATIONS

8.5.1 ANCHORAGE

Because of the narrow harbor entrance and shallow water a special survey by the USS REHOBOTH was made in the open water south of Johnston. From this survey, anchorage areas were assigned and temporary buoys were laid to outline this anchorage. Except for a heavy easterly swell, the anchorage proved adequate. The swell made small boating a little on the dangerous side but fortunately there were no casualties. Due to rocket firing many days and evenings were spent at sea because of danger in the anchorage area from falling first stage motors.

[redacted]

8.5.2 FUELING

Numerous rehearsals and the evacuation of the anchorage area for rocket firing made it necessary for BOXER to refuel the two destroyers assigned about every four days. This did not interfere in any way with the operation, and gave both BOXER and the two destroyers training in refueling at sea.

8.5.3 NOSE CONE RECOVERY

One of the unique features of the NEWSREEL Operation was the night recovery of nose cones after each of the events. For this operation, the following forces were assigned:

USS BOXER (CVS-21) - with 6 HRS-3 helicopters.

USS LANSING (DER-388)

USS SAFEGUARD (ARS-25)

PATRON TWENTY-EIGHT (two P2V-5Fs)

Unlike the Eniwetok phase of nose cone recovery the great majority of the units fired on TEAK and ORANGE functioned properly. This made the search and recovery of these objects infinitely easier. For the TEAK event, seven out of nine units were recovered, and for the ORANGE event, six out of eight were recovered. The search phase of P2Vs proved beyond doubt that if any one of the several recovery instruments on the unit functioned, it was possible to locate and recover the cone. For the TEAK event, two units were recovered by use of UHF homer only, one unit by light only, and two units by dye marker only. Some difficulty and time consuming delay in the detection of the TEAK units came about due to the wide dispersion of units from the predicted impact area. For example, the pod was located 17 miles north and west of predicted impact and the two samplers were finally located on the Johnston reef some 7 and 15 miles north of predicted impact. However, the instrumentation cones were recovered quite close to their predicted impact points. The recovery method used for the TEAK event included both shipboard and helicopter recovery. No particular difficulty was experienced in the recovery operation.

The method of nose cone recovery used for the TEAK and ORANGE events proved to be highly successful. At about H/30 minutes the search P2V took off from Johnston and commenced search in the impact area under LANSING control. She found and marked the units and helped direct LANSING and SAFEGUARD into the

(8.5.3 Cont'd.)

impact area. This was accomplished by flares and marks on LANSING radar when the P2V was over the unit. Searchlight would then be used by the ships for recovery. The use of the recovery nets and grapnel hooks was adequate for the recovery. A number of cones failed to transmit on their homing gear but were spotted by the search aircraft from dye marker the next morning. Two of these cones were retrieved by helicopter using the grapnel and delivered to the LANSING forecastle.

8.5.4 LOGISTIC SERVICES AT PEARL

At the end of the TEAK event, the BOXER, COGSWELL, DEHAVEN and LANSING were sailed to Pearl to replenish. This method of replenishment proved extremely valuable in the savings of logistic support ships and the morale of crews, (especially since no replenishment nor liberty was available at Johnston).

8.5.5 EVACUATION AND RE-ENTRY

Pre-shot evacuation and muster procedures used for NEWSREEL were in general the same as those used in the EPG for SYCAMORE and POPLAR events.

Space aboard BOXER for officer types was at a premium due to the fact that no other large vessel was present and BELLE GROVE could not be used for evacuation because of safety considerations. (Scientific projects aboard BELLE GROVE required her to be in a danger area). Two hundred and fifty cots were carried by BOXER (about 150 actually used) to take care of officer type accommodations when wardroom area was filled.

Various methods for bringing personnel aboard BOXER by water lift were tested in order to make this transfer as safe as possible in the seas and heavy swell that were often present in the vicinity of BOXER anchorage. These included:

a. Placing a small float (about 12 ft by 20 ft) alongside the conventionally rigged port accommodation ladder and then bringing an LCM next to the float. The float provided very little added safety over that provided by having the LCM make the accommodation ladder directly.

b. A standard YVC barge was brought alongside the BOXER in the vicinity of the port accommodation ladder with the intention of lowering the ladder onto the barge and letting it ride up and down on the barge. Casters

[redacted]

(8.5.5 Cont'd.)

were placed on the lower end of the ladder to facilitate this and it was found that the top landing of the ladder could also be swiveled out. This method was ruled out because the barge experienced too much vertical motion and would have made ascending the ladder unsafe. In addition, the barge was damaging the ship's side.

c. Using the crane on the starboard boat pocket of the hangar deck to hoist personnel aboard from an LCU by pallets supported in cargo nets. A double pallet with two cargo nets created a platform on which about fifteen persons could be lifted at once. This was judged to be a satisfactory method and a more permanent "bird cage" was constructed by Holmes and Narver consisting of a 10' by 10' platform with angle iron sides and a suitable lifting padeye. This platform was capable of lifting 45 personnel at one time.

A total of not over 300 personnel were loaded for evacuation in each LCU trip and most trips averaged about 150. Evacuation by helicopter was restricted to those personnel who were required to remain at Johnston until 1600 or later. Evacuation was completed by 1710 with a total of about seventy persons being evacuated by helicopter.

A total of 1030 personnel per event were evacuated to the BOXER for the TEAK and ORANGE events and an additional 38 scientific personnel to the other ships present. Personnel evacuated to the BOXER included 88 from BELLE GROVE, 10 from LANSING and one from SAFEGUARD, all from ships' company. These personnel were evacuated in order to reduce the hazard (even though an infinitely small one) due to the location of these ships relative to ground zero and the launching site.

For re-entry after both TEAK and ORANGE, both LCUs and helicopters were used with priority being determined by the CJTF SEVEN Evacuation Officer. Lists of personnel to be evacuated in order of priority by both helicopter and LCU were prepared by JTF SEVEN based on requests of all Task Groups having personnel required ashore early after the events.

8.5.6 CASUALTIES

Two casualties occurred to the USS COGSWELL (DD-651). Three days before the TEAK event, the SRB transmitter experienced a serious failure. As

[redacted]

[redacted]

(8.5.6 Cont'd.)

the SRB radar was required by Project 6.5, immediate efforts were started to effect repair, even though the failure was of a nature that would have ordinarily required a shipyard or tender availability. With the assistance of the Philco field engineers, the transmitter was disassembled, and restored to complete operating efficiency by TEAK event time.

Enroute to Pearl Harbor following TEAK, the foremast of the USS COGSWELL failed just below the yardarm, and all electronic antennas installed on the foremast were carried away. Inspection of the break revealed that the failure had been cumulative over a period of time, with only about 20% of the circumference of the mast showing evidence of a new break. This failure was not entirely unexpected, as the ShipAlt had been issued to replace all pole masts of this type with tripod masts. This alteration had been scheduled for accomplishment during the COGSWELL's last overhaul period, but unfortunately, was cancelled.

The USS EPPERSON (DD-719), through the usual outstanding cooperation of CINCPACFLT, was immediately substituted for the USS COGSWELL, and all Project material was expeditiously transferred to the EPPERSON by Project personnel, assisted by the Pearl Harbor Naval Shipyard.

The USS DEHAVEN (DD-727) made a casualty report on 5 August 1958, following a boiler inspection by DESFLOT FIVE. It was reported that all boilers showed evidence of impending tube failure as a result of stress corrosion. The performance of the DEHAVEN in NEWSREEL was not affected, however, although high speed operations were avoided.

8.6 COMMUNICATIONS

8.6.1 GENERAL

The mission of communications during the NEWSREEL Phase of Operation HARDTACK was to provide communication facilities and services for Commander Task Unit 7.3.5. In addition, the communication facilities of the Flagship, USS BOXER (CVS-21), were utilized for the Air Operation Center of Commander Task Group 7.3 which was maintained aboard the BOXER, and for Commander Task Element 7.3.5.5 Base Radio Facilities in BOXER.

Despite the fact that there were fewer circuit requirements on BOXER than there had been during the Eniwetok/Bikini phase of the Operation, equipment

[redacted]

(8.6.1 Cont'd.)

usage was closer to saturation because the multi-channel equipments used at Eniwetok (Single Sideband) were not in use. The large number of HF frequencies required for air to ground communications, the necessity of establishing HF communication with Honolulu, and the need to have two frequencies for communication with ships transiting the area employed all the 500 watt and 100 watt HF transmitters.

8.6.2 PLANNING

Planning was coordinated with Communication Sections of Joint Task Force SEVEN and Task Groups 7.1, 7.4, and 7.5. Since NEWSREEL was to be conducted on an austerity basis only the minimum communication facilities would be provided.

8.6.3 COMMUNICATION BETWEEN FLAGSHIP AND JOHNSTON ISLAND

When within UHF range of Johnston Island two telephones and one teletype lines were provided by AN/TRC-24. The two telephone lines connected the Johnston Island switchboard and the BOXER switchboard. The teletype line linked the Joint Communication Facility, Johnston and the Communication Center in BOXER. When BOXER was out of UHF range, as she was when on station for H hour, a Sideband Channel between Johnston Island and BOXER was provided. This was used as a hot line linking the Command Post on Johnston, the AOC in BOXER, and Flag Plot in BOXER. Although the equipment in use on this circuit in BOXER would have permitted many channels of voice and teletype, that in use on the beach permitted only one channel operation.

8.6.4 FREQUENCIES

An attempt was made to reduce the number of new frequencies required for NEWSREEL and to use those frequencies already used for the Eniwetok/Bikini phase of HARDTACK. CTE 7.3.5.5 required the use of three HF channels for Air/Ground communication. Since these had not been assigned for use in Eniwetok, new frequencies were required, requested, and obtained.

The frequency of transmission of Sideband from BOXER had to be changed from 4030 kc to 2270 kc because of interference.

The primary tactical UHF had to be changed from 277.8 mc to 333 mc in order to avoid interference with scientific projects. The frequency 333 mc

(8.6.4 Cont'd.)

was available as it had previously been assigned to Task Group 7.3 as a OI net secondary for which it was never used.

The primary tactical HF, 6445 kc, was useless at night as the interference was so great as to make all stations unreadable. Since the frequency 5475 kc was available as our alternate secondary tactical frequency, it was used for the primary tactical HF.

No Task Group broadcast was initiated for NEWSREEL. All units were required to maintain their own fleet broadcast intercept.

All units were required to maintain guard on what was in the Eniwetok area used as a relay net but for NEWSREEL became in effect a Task Group common. This net was also used for communication with units transiting the area. For this latter purpose it was not adequate since most of the units transiting had too few radiomen to maintain a continuous guard. It was difficult to say whether the lack of reliability was due to poor guards on the ships transiting or to propagation conditions. The former seems more likely since in all cases where we could reach a unit expeditiously via the fleet broadcast and request tnat he contact us, contact was established.

8.6.5 TIME COUNTDOWN

Special receivers to receive the time countdown were installed in several of the ships. Since the long range countdown was broadcast on 7 mc and 14 mc Sideband frequencies, tuning of the signal into installed equipment on vessels other than BOXER presented difficulties. In BOXER one of the installed R390 receivers was used to receive the time countdown with no untoward incident. It was found that other units could use an RBC receiver with BFO by careful tuning in CW position. Although during rehearsals it was found that the 14 mc frequency was received better than the 7 mc in the stations of COGSWELL, DEHAVEN and LANSING, on TEAK day it was found that the 7 mc frequency was better received. Unfortunately the transmission on the 7 mc frequency was faulty and all units were advised by the time countdown broadcast to shift to the 14 mc frequency. CTU 7.3.5 advised that in view of the generally poor reception of 14 mc, all units receive both the 7 and 14 mc frequencies. In this way countdown was received by all units satisfactorily.

8.6.6 PERSONNEL

Adequate personnel were available in the Flagship. HITCHITI was, with her allowance of radiomen, unable to copy continuous fleet broadcast and maintain a continuous guard on the Task Group common. Three radiomen from the Flag allowance in BOXER were sent to HITCHITI.

8.6.7 TRAFFIC ANALYSIS

During the period of NEWSREEL Flagship traffic averaged 480 messages a week. This is about one seventh of the Eniwetok peak load.

8.6.8 LNO COMMUNICATIONS

The Task Group 7.3 LNO at Johnston was provided communication service by the Joint Communication Facility, Johnston. In addition, copies of all messages sent or received by Deputy CTG 7.3 in the Flagship were delivered ashore to the LNO by helicopter.

8.6.9 POST TEAK COMMUNICATION

After TEAK was fired, HF communication between the Flagship position fifty miles NE of Johnston and Honolulu was lost for a period of about six hours. Newspaper reports indicated that this blackout was felt as far away as Sydney, Australia.

8.7 SPECIAL INSTALLATIONS

A considerable amount of special project material was installed on several ships, as listed below:

SHIP	PROJECT	DESCRIPTION OF PROJECT MATERIAL
BELLE GROVE	32.3	Trailer van with engine driven generator installed on super deck.
DEHAVEN, COGSWELL and EPPERSON	4.1	Rabbit hutches, wooden A-frames, cameras on O1 level weather deck.
	6.5	Cameras and recorders used with SRB radar.
	6.12	Antennas, receivers and recorders installed on forward 5-inch mount.
	8.1	Exposure meters and skin simulants mounted with Project 4.1 material.
LANSING and SAFEGUARD	32.3, 32.5, 32.6, 8.6	Nose cone recovery equipment, (nets, hooks, etc.)

[redacted]

(8.7 Cont'd.)

SHIP	PROJECT	DESCRIPTION OF PROJECT MATERIAL
HITCHITI	4.1	Rabbit hutches, wooden A-frames, cameras on O1 level weather deck.
	8.1	Exposure meters and skin simulants mounted with Project 4.1 material.

In addition, all ships except BOXER and SAFEGUARD received countdown receiver installations, either HF or VHF. (See paragraph 8.6, COMMUNICATIONS).

8.8 CONCLUSIONS

1. Planning, timing (except for dissemination of danger area HYDROPAC), and assignment of forces was entirely adequate for each event. No unforeseen problems arose that caused any delay in event time or that required last minute major revision of plans. The surveillance area was covered and cleared of surface craft as required prior to each event.

2. The communication facilities, plans and personnel were adequate except for the limitation on telephones at shot time and the lack of spare HF equipment in view of the heavy air/ground and air control requirements.

3. Ships and units assigned were adequate to perform the mission.

4. The easterly swell in the open anchorage area caused considerable rolling of the smaller ships. This rolling presented some problems in boating when transferring the non-Navy personnel of the Task Force from boats to ships, however, there were no injuries to any personnel.

5. Nose cone recovery operations were satisfactory and both search and recovery methods were adequate for the task.

6. The logistics at Pearl between events was of great value from both the logistics and morale standpoint.

8.9 RECOMMENDATIONS

1. Requirements for area surveillance be firmed as far in advance of event date as practicable to permit early determination of additional forces, an orderly assignment of such forces, and early dissemination of the danger area HYDROPAC.

2. That the HYDROPAC be issued at least two months in advance and be republished directly prior to commencement of operations.

[redacted]

[redacted]

(8.9 Cont'd.)

3. Surveillance requirements for events outside of EPG danger area continue to be directed and controlled by the cognizant FAIRWING Commander. The search plans should be approved by CTG 7.3.

4. That a multi-channel Sideband circuit be provided between the Flagship and shore installation for use when the Flagship is outside of UHF range.

5. That liaison between the scientific projects and the participating ships be established at an early date. Many of the Project personnel had never visited a Navy ship prior to coming on board at Johnston Island. The problems of rough seas, sea sickness, difficulties of shipboard installations, slow transportation, etc., were completely strange to most of the Project personnel.

6. That Philco or other civilian electronics field engineers again be obtained for future operations of this nature.

7. That a few personnel participate in any phase of operations who will be available for planning and initial execution of next overseas test.

[redacted]