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FINAL REPORT OPERATION CASTLE

PACIFIC PROVING GROUND
SPRING 1954

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BY AUTHORITY OF DOE/OC

REVIEWED BY [REDACTED] DATE [REDACTED]
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JOINT TASK FORCE SEVEN

MAJOR GENERAL P. W. CLARKSON
UNITED STATES ARMY
COMMANDING

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15 June 1954

FINAL REPORT BY THE COMMANDER, JOINT TASK FORCE SEVEN

to the

JOINT CHIEFS OF STAFF AND CHAIRMAN, ATOMIC ENERGY COMMISSION

on

1954 OVERSEAS WEAPONS TESTS

OPERATION "CASTLE"

Reference: a. JCS 2179/43
b. JCS 2179/46
c. JCS 2179/47
d. JCS 2179/49
e. JCS 2179/52
f. JCS 2179/53
g. JCS 2179/62

THE PROBLEM

1. To present a report of the activities of Joint Task Force SEVEN during Operation CASTLE to the Joint Chiefs of Staff in compliance with paragraph 7 of Enclosure "A" to JCS 2179/47, and to the Chairman, Atomic Energy Commission.

DISCUSSION

2. (See Enclosure)

CONCLUSIONS

3. The mission of Joint Task Force SEVEN, as delineated in Enclosure "A" to JCS 2179/47, was successfully accomplished.

4. The issuance of press releases prior to the beginning of the operation, again after several of the detonations and at the conclusion of the series proved to be sound procedure.

5. In view of the high yield of the devices and weapons tested, the danger area established prior to the operation proved to be too small. The enlarged area adopted after the first detonation was adequate for the devices and weapons tested.

6. Information is needed as to the possibility of a high yield detonation causing a tsunami under varied conditions of firing.

7. The designation of the task force commander as senior representative of the Atomic Energy Commission at the Pacific Proving Grounds facilitated overseas

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operations by establishing a single authority over all components, military and civilian, of the task force.

8. Military support forces provided were adequate and essentially in the correct amount.

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10. The emergency capability of high yield thermonuclear weapons in the megaton range was demonstrated.

11. The weather, primarily upper wind patterns, determines to a great extent the detonation schedule of weapons and devices in the megaton range when they are fired from the ground or on barges over shallow water.

12. Realistic fallout predictions for high yield weapons require reliable wind forecasts for the first 24 hours following a detonation. Data obtained during CASTLE must be studied in order to develop dependable criteria for predicting fallout resulting from high yield detonations. A network of manned stations equipped with appropriate instruments and radio facilities will provide a valuable safeguard for populated areas within five-hundred miles of the shot site.

13. Fear of causing a tsunami of destructive proportion as a result of very high yield detonations will be present during future tests until this question is resolved.

RECOMMENDATIONS

14. That the Joint Chiefs of Staff and the Chairman, Atomic Energy Commission note the above conclusions.

15. That, incident to future overseas tests, joint Atomic Energy Commission - Department of Defense public statements be released prior to the start of the test series, after each detonation and at the conclusion of the test series.

16. That an adequate danger area around the Pacific Proving Grounds be established prior to future overseas test series and that information concerning the establishment be given wide dissemination.

17. That tests be conducted prior to Operation REDWING to determine the possibility of high yield detonations causing tsunamis.

18. That the Atomic Energy Commission and Department of Defense, utilizing

the capabilities of the permanent joint task force, maintain a capability of testing one or more high yield devices or weapons at the Pacific Proving Grounds on short notice, requiring minimum buildup of forces.

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ENCLOSURE

DISCUSSION

INTRODUCTION

1. Joint Task Force SEVEN (JTF SEVEN), commanded by Major General P. W. Clarkson, U.S. Army, was formerly Joint Task Force 132 and was redesignated as JTF SEVEN on 1 February 1953. The Commander, Joint Task Force SEVEN (CJTF SEVEN), was designated by the Chairman, Atomic Energy Commission (AEC) as the senior representative of the AEC at the Pacific Proving Grounds on 15 December 1953. The command post was opened on Parry Island, Eniwetok Atoll, Marshall Islands, at 171200Z, January 1954 and was closed at 170001Z, May 1954.

2. Seven detonations had been scheduled when the task force arrived in the Pacific Proving Grounds. Five of the original seven, plus one substitute, were actually detonated. In conjunction with these detonations, scientific and weapons effects experimental programs were conducted. This report describes the weapons and devices and presents preliminary conclusions which can be drawn from early analysis of available data. More definitive conclusions will appear in technical reports to be published at a later date. This report covers, in summary, the operational, security, communications, logistical and fiscal aspects of JTF SEVEN. Detailed information regarding these subjects will be included in the History of Operation CASTLE, to be completed by 31 July 1954. The CASTLE Film Report will be completed and prints forwarded on or about 31 July 1954.

3. The planning date of 1 March 1954 was established for detonation of the first shot in accordance with JCS 2179/53. The report by CJTF SEVEN to the Executive Agent dated 8 January 1954 stated that the task force was prepared to conduct its first test ~~SECRET~~ on schedule, 1 March 1954.

a. The shot schedule as of 1 March 1954 was:

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b. Because of adverse weather, the effects of

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actual detonation dates were as follows:

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4. The experience gained in previous operations by key military and civilian members of the task force made possible accurate, detailed planning for the operation in advance of the movement from the Zone of Interior (ZI). Therefore, the task force headquarters was required to issue only brief checklist directives in advance of each detonation.

WEAPONS AND DEVICES TESTED

5. GENERAL

a. The scientific objectives set forth for CASTLE can be briefly stated as follows:

(1) Achievement of emergency capability on at least one weapon.

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(3) The acquisition of experimental information pointing the way to future developments in the direction of weight reduction of thermonuclear weapons.

(4) Obtain effects information.

b. At the beginning of CASTLE,

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difference between the two being the types and amounts of materials in thermo-nuclear components.

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12. The preceding is a summary of the significant achievements of CASTLE in the light of the scientific objectives previously set forth. A summary of the features of the weapons and devices tested is presented in Appendix H. It can be concluded that CASTLE achieved the following:

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MILITARY SUPPORT

13. On 4 August 1952, CJTF SEVEN submitted a report to the Joint Chiefs of Staff outlining the military participation program for CASTLE, then planned as a 4-shot nuclear and thermonuclear test operation scheduled for September - October, 1953. On 20 October 1952, the Joint Chiefs of Staff made certain modifications to this report and approved the program for planning purposes only. Concurrently, the Joint Chiefs of Staff directed the joint task force commander to revise the military force requirements on an austere basis. Subsequently, the AEC and the Department of Defense (DOD) approved a plan to broaden CASTLE to a 6-shot (all thermonuclear) operation and to postpone the tests until January - February of 1954. The program was later increased to seven shots. The Commander, JTF SEVEN, submitted modified support requirements, as directed, on 17 February 1953, having withheld action until the AEC could formally present a proposed revision of the CASTLE concept. On 14 April 1953, the Joint Chiefs of Staff approved the modified support requirements and authorized CJTF SEVEN to further modify the military requirements as changes were made in the operational concept of the tests. The commander of the joint task force was further authorized direct communications with the three military Services to effect further modifications. The Joint Chiefs of Staff instructed each military Service to establish suitable priorities to insure timely manning and equipping of the task force and to provide additional forces and services as necessary. Military forces provided are reflected in

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Appendices C through G. The task force received full cooperation from all three military Services.

OPERATIONS

14. ORGANIZATION AND COMMAND RELATIONSHIPS

a. The task force was organized into a headquarters and five functional task groups designated as:

- (1) Task Group 7.1 (Scientific)
- (2) Task Group 7.2 (Army)
- (3) Task Group 7.3 (Navy)
- (4) Task Group 7.4 (Air Force)
- (5) Task Group 7.5 (AEC Base Facilities)

b. Forces were drawn from the AEC and its contractors and the three military Services. Appendix A depicts the general organization for CASTLE. Appendix B depicts the organization of Headquarters, JTF SEVEN.

c. Organization, mission and major equipment of the various task groups are depicted in Appendices C through G.

15. PLANNING AND TRAINING. As the mission and concept of CASTLE became known, Operation Order No. 1-53 was issued to cover the activities of the task force during the buildup phase. As the concept became more firm, Operation Plan No. 3-53 was issued to cover the period of operations from the time major elements of the task force were deployed in the forward area until completion of on-site operations. Operation Plan No. 3-53 became effective as an order on 17 January 1954. These publications defined in detail the missions for various subordinate units and, although closely monitored by task force headquarters, training prior to the on-site phase was the responsibility of the various units. The highlight of training prior to the on-site phase occurred in October 1953, when the Air Force Task Group and Navy Task Group conducted a rehearsal in the Pacific Ocean near San Diego, California.

16. ON-SITE OPERATIONS

a. The on-site phase of CASTLE commenced with the establishment of command posts in the forward area on 17 January 1954. Arrival of major components in the forward area was phased to coincide with the immediate operational needs.

Meanwhile, construction of test facilities progressed substantially as planned.

b. By 1 February 1954 all task force elements had arrived in the forward area and preparations were begun for the conduct of the first full scale rehearsal. Extensive preliminary communications checks were made and on 23 February the rehearsal for the first shot was successfully carried out. This was the only full scale rehearsal conducted. Since all shots were statically detonated and operations were similar, each detonation served as a rehearsal for the one to follow.

c. [REDACTED] was detonated at 0645 local time on 1 March 1954. Prior to this shot all personnel were evacuated from Bikini Atoll, except for a small firing party which remained in a bunker on Enyu Island, approximately twenty miles from zero point. At the time of the detonation all task force ships in the Bikini area were located southeast of the atoll at least thirty miles from zero point. After the shot it became necessary to close the camps on Bikini Atoll because of the radiological contamination and blast damage. Subsequent operations at Bikini were conducted principally from afloat.

d. Because of unfavorable weather conditions at Bikini, it was not until 27 March that [REDACTED] was detonated. The concept of the shot schedule was reviewed and revised to incorporate more flexibility. [REDACTED] was rescheduled to be fired at Eniwetok Atoll. On 7 April, [REDACTED] was detonated at Bikini, on Eninman Island.

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On 14 May, the Eniwetok weather became favorable and [REDACTED] was detonated. Except for rollup and redeployment, the on-site phase was essentially completed with the last shot.

e. As tasks were completed, units of the task force were redeployed and individuals were returned to parent organizations or were reassigned. In accordance with previously prepared plans, reduced planning staffs and certain troop elements were reformed as components of the task force in order to provide for

continuity of operations and for economical, expeditious support of Operation REDWING, scheduled for the Spring of 1956.

f. Prior to firing [REDACTED] some concern was voiced as to the possibility of causing a destructive tsunami (tidal wave) of dangerous proportions since the device was positioned on the edge of the reef. This same question arose prior to firing MIKE during Operation IVY. In both cases it was disconcerting to the commander to have this question raised by scientists just prior to shot time. In both cases after study, the task force scientific director assured the commander that under the specific conditions of the particular test involved a tsunami would not occur. This question will continue to arise with certain high yield detonations until suitable tests are conducted to resolve the problem.

METEOROLOGY

17. As in previous operations, weather was a major problem, particularly with regard to winds aloft for fallout considerations. Delays were experienced because of unacceptable fallout patterns. The tests were carried out during a period of the year when the weather in the Marshall Islands area was reasonably favorable; it was not an unusual season from a climatological point of view. Future tests must expect similar delays due to weather unless firing techniques such as firing on barges in the open ocean or air drops are developed which will minimize the amount and the activity of fallout.

RADIOLOGICAL SAFETY

18. During CASTLE it was more important than on previous tests to make certain that populated islands and transient shipping were not contaminated since the detonation of six weapons and devices were planned with yields expected to be in the megaton range. The lack of fallout information from previous shots of megaton yield weapons or devices was a serious handicap.

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Consequently, more radioactive debris was carried up and diffused over a much larger area than was thought possible. [REDACTED] demonstrated that the origin of the fallout pattern is a large area up to fifty miles in diameter, varying according to the yield. The radioactive intensity of the debris, likewise, varies with the yield.

19. Radioactive debris from the [REDACTED] cloud contaminated populated areas which necessitated the evacuation of groups of Marshall Islands natives and certain U.S. military personnel. The experience gained from [REDACTED] was valuable in evaluating radiological safety conditions on subsequent shots so that no additional significant contamination of populated areas occurred.

20. The primary means of rapidly determining the relation of forecast to actual particle trajectory was the use of aerial cloud tracking flights. Information obtained from these flights, combined with reports from ground monitoring stations, made possible rapid determination of fallout patterns after each shot.

21. The planned maximum permissible exposure (MPE) of personnel was 3.9 roentgens. However, it was anticipated that this limit was too low considering the number and expected yields of the weapons and devices to be tested. Therefore, the provision of waiver of this MPE by the task force commander was established. The Surgeons General of the three military Services and the Director, Division of Biology and Medicine, AEC, approved the granting of waivers as necessary. Only in relatively few cases was it necessary to do so.

PERSONNEL AND ADMINISTRATION

22. After Operation IVY, tables of personnel distribution were revised and new requirements set up for CASTLE. The Army, Navy and Air Force filled the joint task force requirement for both officer and enlisted personnel. During the operation additional personnel were found to be required. These were obtained on temporary duty status and sent to the forward area.

23. The decision of the Secretary of Defense to reduce surplus military manpower in the military Services during 1953 resulted in the appointment of a DOD joint manpower survey board under the monitorship of G-1, Department of the Army, to study the personnel requirements of JTF SEVEN and to recommend an interim table of distribution. The Commander, JTF SEVEN, concurred with the report of the board and the proposed table of distribution, which closely approximated the figures previously estimated by CJTF SEVEN, was adopted.

24. The official observer program for CASTLE, as approved by the AEC and DOD, provided for a total of twenty observers for each detonation. Space allocations were distributed equally between the AEC and DOD. Military Air Transport Service (MATS) arranged special air mission flights in conformity with the schedule of

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detonations. The first group of observers made the trip to the forward area, observed ~~REDACTED~~ and returned in seven days. As a result of unfavorable weather conditions the next two shots were delayed, resulting in many of the most important observers being forced to return without witnessing detonations. To preclude these undesirable delays and to insure a fixed schedule for future flights, CJTF SEVEN, with the approval of the AEC and DOD, arranged for the cancellation of the four remaining special air mission flights and the substitution of two observer flights to depart and return on specified dates without regard to the shot schedule.

SECURITY, INTELLIGENCE AND PUBLIC INFORMATION

25. SECURITY

a. Security activities were conducted in accordance with applicable AEC and DOD regulations and directives. Headquarters, JTF SEVEN, published security memoranda to provide specific instructions for the task groups in such matters as personnel clearance, security indoctrination, badge identification and security couriers. These memoranda were further augmented by posters displayed in offices and public places. A movie program consisting of security talks by senior commanders and security shorts was presented in conjunction with the recreational movie program.

b. By decision of the Joint Chiefs of Staff on 14 April 1954, the provisions for CJTF SEVEN to report to the Commander in Chief, Pacific (CINCPAC) for movement control and general security with respect to the task force and Eniwetok Atoll was broadened to include Bikini Atoll. The Eniwetok-Bikini area of operations was closed to all vessels, aircraft and personnel except those participating in the operation and access to the area was controlled by the provisions of CINCPAC letter, Serial 020, dated 1 April 1952.

c. Coordination was maintained with the Federal Bureau of Investigation (FBI); Counter Intelligence Corps (CIC), U.S. Army; Criminal Investigation Division (CID), U.S. Army; Office of Special Investigations (OSI), U.S. Air Force and Office of Naval Intelligence (ONI), U.S. Navy, in all areas in which elements of the task force operated. Security aspects for such activities as the shipment of weapons and device components to and from the forward area required close

coordination with the above agencies as well as military protection provided by CINCPAC and JTF SEVEN.

d. The Army Task Group was responsible for conducting necessary ground security patrols and the Navy Task Group conducted air and sea patrols. Appropriate task force personnel were indoctrinated in the correct and expeditious reporting of contacts.

e. There were no major security violations.

26. INTELLIGENCE. Intelligence summaries, as well as estimates and comments received from intelligence agencies of the three military Services, were collated and evaluated so as to determine their effect upon the plans and operations of the task force. Several contact reports in the forward area received immediate evaluation but none were determined to have derived from an enemy source.

27. PUBLIC INFORMATION. Releases to the press pertaining to JTF SEVEN operations and activities were made only by the AEC and DOD. A release was made prior to the establishment of the task force in the forward area and again following the first three detonations. After completion of the operation a final release was made. In order to insure that all personnel in the task force had knowledge of the information which had been made public, the content of the releases was made known to all personnel of the task force.

LOGISTICS

28. TRANSPORTATION

a. All movement requirements of JTF SEVEN were planned and accomplished in accordance with broad policies and procedures previously established and involved utilization of the movement capabilities of MATS and of the Military Sea Transport Service (MSTS). Requirements for movement of personnel and cargo via air and surface transportation were originated by the various task groups and were submitted to CJTF SEVEN for review and consolidation prior to submission through channels to the Executive Agent.

b. Airlift by MATS aircraft was used extensively to expeditiously move to the forward area essential personnel, priority supplies and equipment requiring rapid delivery. Airlift was used to return large numbers of personnel to duty stations in the ZI. The cargo return volume was considerably diminished since a

large part of the outbound cargo was expended. Surface lift was utilized to the greatest extent practicable. MSTC vessels lifted a considerable amount of replacement and buildup military personnel to the forward area. Surface lift accounted for a large volume of general cargo, construction materials, general supplies and vehicles.

c. The phasing of men and materials to the forward area began during April of 1953 and was not completed until the end of January, 1954. The greatest problem encountered in connection with surface transportation was that of lifting more than two-hundred heavy-lift items including nearly one-hundred large van type trailers. Many of these trailers contained electronics equipment which required very careful handling. All vessels used had to be self-supporting insofar as heavy-lift gear was concerned since no floating cranes are available at the Pacific Proving Grounds.

d. To expedite the processing and movement of personnel and equipment through transshipment points, liaison officers were continued at the U.S. Naval Supply Center, Oakland, California; Travis Air Force Base, California; Hickam Air Force Base, Oahu, T.H., and the U.S. Naval Station, Kwajalein, M.I. These agencies are essential.

e. During the operation, 88 vessels were utilized to transport 1,314 passengers and 156,930.6 measurement tons of west and eastbound cargo. This does not include cargo and personnel transported in Navy Task Group ships. A total of 17,499 passengers and 2,257 short tons of freight were airlifted east and westbound. Appendix I presents logistics data concerning air and surface transportation to and from the Pacific Proving Grounds.

f. Forward area transportation was both interatoll and interisland (within an atoll) and required both air and surface movements. Interatoll air traffic was handled primarily by four C-47 aircraft and two specially configured PBM aircraft. Surface traffic was serviced by two LST vessels augmented by one LSD. Interisland traffic at both atolls was handled by H-13, H-19 and L-13 aircraft and by surface craft of the LCPL, LCM, water taxi, LCU, small tug and barge types. For the most part, traffic was serviced on established schedules which were revised frequently to conform with existing movement requirements. Appendix J indicates surface logistics for interatoll and interisland activity. The amount of inter-

atoll cargo tonnage handled was 74,887.6 measurement tons and the interisland tonnage amounted to 1,304,488.6 measurement tons for a total of 1,379,376.2 measurement tons. The number of personnel transported interatoll amounted to 1,429 passengers and the passengers transported interisland amounted to 275,718 for a total of 277,147 passengers.

g. The air transportation of personnel (interatoll and interisland) from 1 January 1954 through May 1954 amounted to 24,078 passengers.

29. SUPPLY

a. In the ZI normal support of the military elements of the task force was provided through established supply sources of the respective military Services, while support of the AEC elements was provided by Los Alamos Scientific Laboratory, University of California Radiation Laboratory and associated activities and contractors.

b. In the forward area the military elements of the task force were supported by ZI depots and other military supply activities with the exception of petroleum, oil and lubricants which were provided by the Commander, Service Force, Pacific Fleet (COMSERVPAC). The Overseas Supply Agency (OSA), San Francisco Port of Embarkation, processed all Army supply requisitions except emergency requests. Naval material was furnished principally through the Naval Supply Centers at Oakland, California and Pearl Harbor, T.H., while the Air Force Task Group received its support from the Sacramento Air Material Area, Sacramento, California. Emergency support was provided by U.S. Army, Pacific (USARPAC); COMSERVPAC; Hickam Air Force Base and U.S. Naval Station, Kwajalein. The AEC elements in the forward area were supported in the same manner as in the ZI, utilizing military port and shipping facilities.

c. Technical and nonstandard items peculiar to the conduct of the tests were obtained from the AEC, appropriate military Service or commercial contractor sources by special arrangement in each case.

d. No problems that could not be resolved were encountered in the supply of the task force.

30. MAINTENANCE AND CONSTRUCTION. The AEC contractor, Holmes and Narver, Incorporated, maintained the fixed plant, except communications facilities, on Eniwetok and Bikini Atolls. Since provisions for maintenance and construction on

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Eniwetok Island were not included in any programs or budgets, authority for required work was obtained with great difficulty. Therefore, a badly needed long range construction plan for Eniwetok Island was developed, coordinated with the task groups and submitted to the AEC.

31. MEDICAL AND HEALTH FACILITIES. The medical facilities in the forward area proved entirely adequate and were based on a 15-day forward area evacuation policy. The Army Task Group provided hospital facilities on Eniwetok Island. The AEC contractor provided an infirmary and aid stations on Parry Island and at various Bikini campsites. The Navy Task Group provided medical services to the forces afloat. Personnel used the closest available medical facility.

COMMUNICATIONS

32. Communications during CASTLE were characterized by a necessity for reliability, flexibility and ability to speedily handle a large volume of messages of a high degree of security.

33. Communications security was given major emphasis. Task force personnel were thoroughly indoctrinated in the necessity for communications security and radio circuits were closely monitored. Security was found to be unusually good but in some instances military communications security regulations (i.e., JANAP 121, 122, AFSAG 1248) unnecessarily hampered operations. Operation CASTLE was recognized as an atomic test - not a tactical military operation - and normal military communications practices were modified where necessary to fit test requirements and expedite operations. Variations and conflicts between communications regulations and practices of the AEC and the DOD created serious operational difficulties. Strenuous efforts were made to provide secure facilities for the rapid exchange of classified information and these greatly accelerated operations. Much automatic on-line cryptographic equipment was employed to handle the unusually large amount of classified messages. It operated very satisfactorily with speed and accuracy and required a relatively small number of operators for the heavy volume of traffic.

34. Radioteletype circuits formed the main communications system. They connected the Pacific Proving Grounds with the AEC and scientific installations through Los Alamos, New Mexico; with worldwide Army and Navy communications

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networks through the Army radio relay station in Hawaii and with the Air Force network through Kwajalein. Other radioteletype circuits interconnected Eniwetok Atoll, Bikini Atoll and major ships of the task force. One relay center located on Eniwetok Island served the entire task force and processed all messages leaving the Pacific Proving Grounds except for a minimum number of direct Navy and Air Force communications which were specifically authorized. The USS ESTES (AGC-12) provided alternate carrier wave (CW) service to Hawaii when required. Submarine and land line cable systems connected islands on Eniwetok and Bikini Atolls. The primary radioteletype facility was supplemented by efficient manual and automatic telephone systems and both short and long range voice radio nets. Telephone and voice radio systems were interconnected to provide maximum flexibility.

35. The communications system met the loads placed on it during CASTLE but the operation emphasized the necessity for increased use of fixed station type communications equipment, properly engineered and installed to meet the rigid requirements imposed upon the system. Distances to be covered by radio are long and require high power transmitters, adequate antennae and optimum performance. Land areas are extremely limited and an excessive number of high power radio circuits must be operated within a small area resulting in unusually difficult interference problems. These radio interference problems became more acute when operations were conducted from aboard ship. Intensive efforts and a high degree of technical skill were required to keep all radio circuits operating satisfactorily. Rapid and unexpected changes in test operations required rapid changes in communications networks, emphasizing the need for maximum flexibility.

36. Peak load traffic exceeded fifty-thousand messages and four million groups per month. This amounted to four times the volume handled for a comparable period during any previous operation. Personnel increases to handle this volume were negligible. The communications centers and their supporting radio and telephone systems were heavily loaded by the increased traffic but were able to meet it because of improved equipment installed.

37. Operation CASTLE required the integration of communications systems and practices of the Army, Navy, Air Force, Scientific and Base Facilities Task Groups. The communications success achieved was, in a large measure, due to the high degree of cooperation and teamwork of communications personnel of these various task groups.

FINANCE AND FISCAL MATTERS

38. As during IVY, the task force commander was provided a fund for defraying expenses over and above those normally incurred by the military Services in support of the operation. This fund was included in the regular Army budget under the appropriation Maintenance and Operations. It was used for task force operating expenses such as travel and temporary duty, transportation, modification of ships and aircraft, procurement of special equipment not common to the military Services and radiological safety equipment and supplies required for protection of the command. Allocations were made direct to the task force commander as chief of an operating agency and allotments were made by him, as required, to task groups and other interested agencies. As of 30 April 1954, a total of \$4,198,347.78 was obligated for operational expenses of the task force.

39. Direct expenses of the DOD scientific programs were funded by the Chief, Armed Forces Special Weapons Project (AFSWP) out of the appropriation Research and Development, Army. Projects of all three military Services were financed in this manner, after evaluation and correlation by the Chief, AFSWP. Total obligations against research and development funds as of 31 March 1954 amounted to \$3,859,000.

40. There are attached, as Appendices K and L, statements showing amounts approved and recorded obligations in operational and scientific funds.

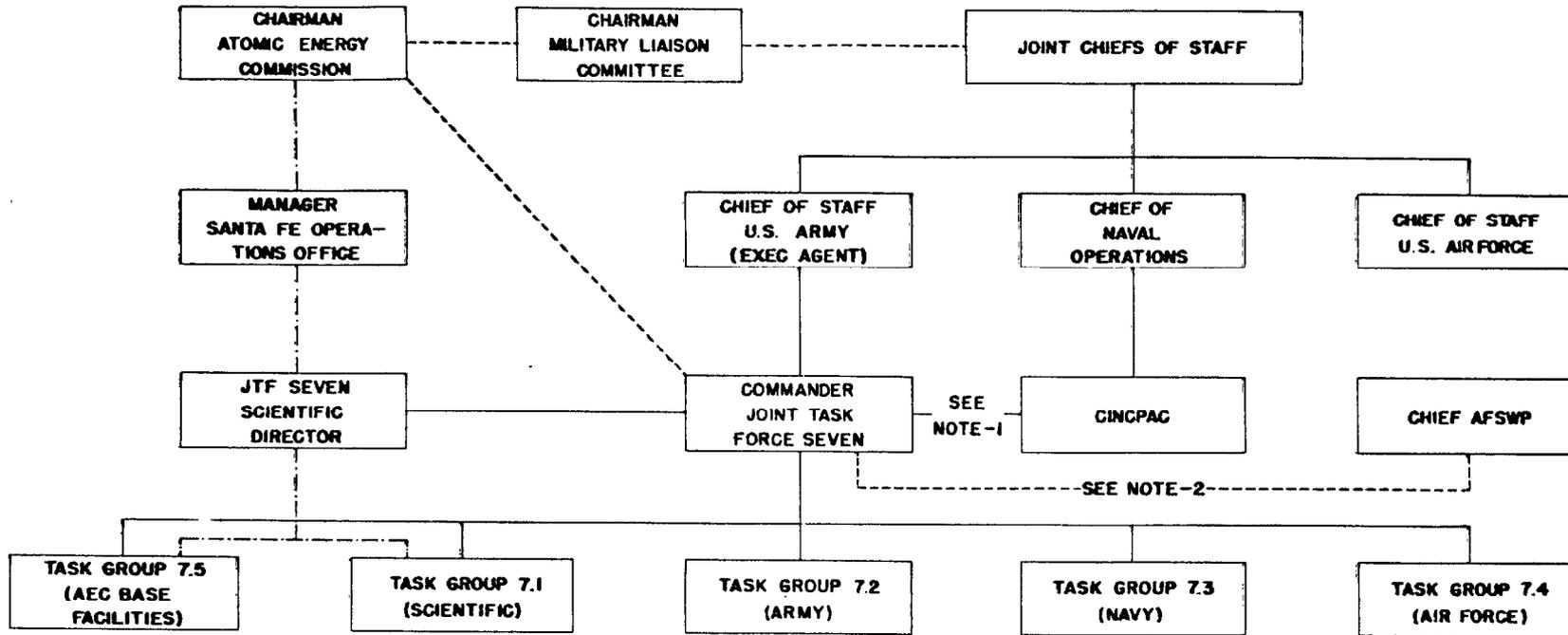
41. Overall costs of the operation in terms of capital costs and operating costs were computed from reports submitted by participating agencies of the military Services, the AEC and other government agencies. As of 31 March 1954, the total reported cost was \$88,223,793. A detailed statement is provided as Appendix M. A final cost report showing costs accumulated for the entire operation will be disseminated at a later date.

APPENDICES

- A Organization for Operation CASTLE
- B Headquarters, Joint Task Force SEVEN Organization
- C Task Group 7.1 (Scientific) Organization
- D Task Group 7.2 (Army) Organization
- E Task Group 7.3 (Navy) Organization
- F Task Group 7.4 (Air Force) Organization
- G Task Group 7.5 (AEC Base Facilities)
- H Summary of Weapons and Devices Tested
- I Surface and Air Logistical Support
- J Interatoll and Interisland Logistical Support
- K Obligations Against DOD Extra Military Funds as of 30 April 1954
- L Obligations Against DOD Research and Development Funds as of 31 March 1954
- M Total Operation CASTLE Costs

ORGANIZATION FOR OPERATION CASTLE

(ON-SITE PHASE)



LEGEND:

- OPERATIONAL CONTROL
- - - - LIAISON
- - - - AEC POLICY

NOTE 1: BY DECISION OF THE JCS ON 13 APRIL 1953, THE COMMANDER OF THE JOINT TASK FORCE WILL REPORT TO THE APPROPRIATE COMMANDER UNDER THE JCS (CINCPAC) FOR MOVEMENT CONTROL, LOGISTIC SUPPORT AND FOR THE PURPOSE OF GENERAL SECURITY WITH RESPECT TO THE TASK FORCE AND ENWETOK ATOLL (LATER BROADENED TO INCLUDE BIKINI ATOLL). IN THE ABSENCE OF THE TASK FORCE COMMANDER FROM THE ENWETOK AREA, THE SENIOR TASK FORCE OFFICER PRESENT WILL, AS ATCOM, REPORT TO CINCPAC FOR THESE PURPOSES.

NOTE 2: BY DECISION OF THE JCS ON 23 APRIL 1953, THE CHIEF OF THE ARMED FORCES SPECIAL WEAPONS PROJECT (AFSWP) WILL EXERCISE, WITHIN ANY TASK FORCE ORGANIZATION, TECHNICAL DIRECTION OF THE WEAPONS EFFECTS TESTS OF PRIMARY CONCERN TO THE ARMED FORCES AT ATOMIC TESTS CONDUCTED OUTSIDE THE CONTINENTAL UNITED STATES. PRIOR TO THE ON-SITE PHASE OF AN OVERSEAS TEST OPERATION, THE TASK FORCE COMMANDER WILL CONSULT THE CHIEF OF AFSWP ON MODIFICATIONS OR DELETIONS TO THE DEPARTMENT OF DEFENSE WEAPONS EFFECTS TEST PROGRAMS.

APPENDIX A

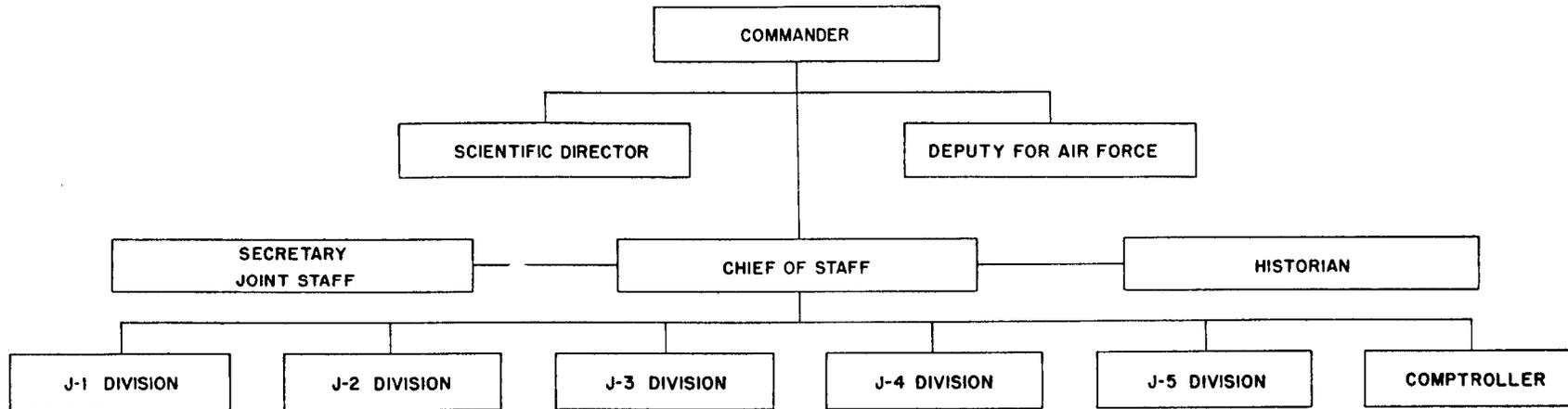
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HEADQUARTERS, JOINT TASK FORCE SEVEN ORGANIZATION

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MISSION

PREPARE FOR AND CONDUCT OPERATIONS AT CASTLE
 PREPARE FOR THE CONDUCT OF EXPERIMENTAL AND TECHNICAL MEASUREMENTS PROPOSED
 BY THE AEC AND DGD AS APPROVED BY THEIR RESPECTIVE AGENCIES.
 PROVIDE FOR THE SECURITY OF THE JOINT TASK FORCE AND ENiwETOK AND BIKINI ATULLS.

KEY PERSONNEL

MAJOR GENERAL P. W. CLARKSON, USA, Commander
 MAJOR GENERAL E. MCGINLEY, USA, Chief of Staff
 DOCTOR A. C. GRAVES, AEC, Scientific Director
 COLONEL M. A. BYWATER, USAF, Deputy for Air
 COLONEL R. H. CUSHING, USA, Assistant Chief of Staff J-1
 COLONEL S. P. WALKER, USA, Assistant Chief of Staff J-2
 COLONEL W. S. COWART, USAF, Assistant Chief of Staff J-3
 CAPTAIN M. L. KNICKERBOCKER, USN, Assistant Chief of Staff J-4
 COLONEL F. C. BOWEN, USA, Assistant Chief of Staff J-5
 COLONEL R. C. DAVIE, USA, Assistant Chief of Staff Comptroller

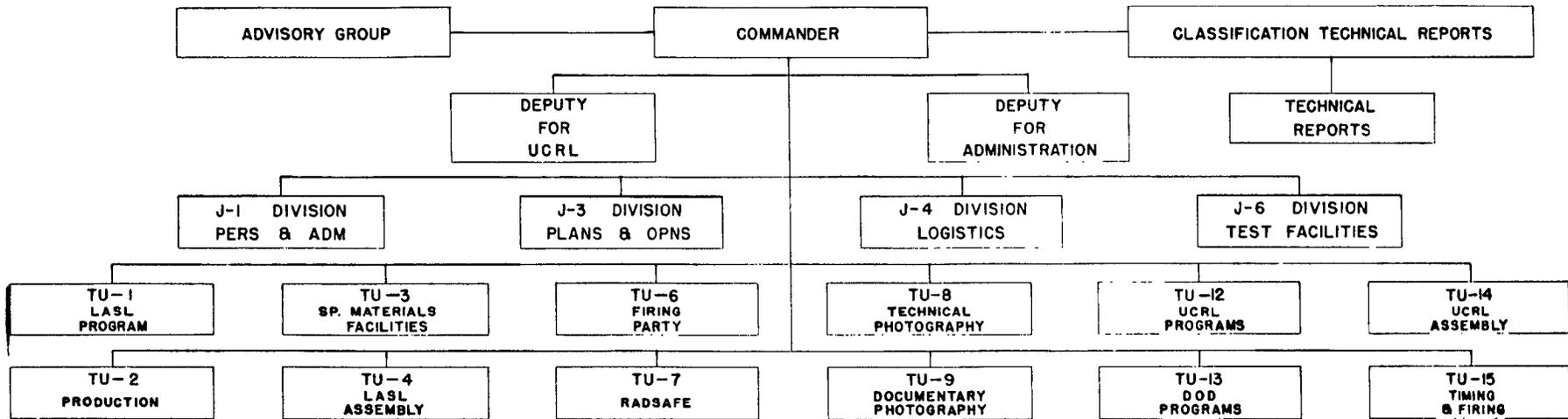
APPENDIX B

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TASK GROUP 7.1

SCIENTIFIC ORGANIZATION

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MISSION

- CONDUCT TESTS OF WEAPONS AND EXPERIMENTAL DEVICES
- CONDUCT TECHNICAL AND MEASUREMENT PROGRAMS AS FINALLY APPROVED
- CONDUCT DOCUMENTARY FILM OPERATIONS
- CONDUCT RADIOLOGICAL SAFETY PROGRAM
- INFORM CJTF SEVEN OF THE TECHNICAL REQUIREMENTS FOR JTF SEVEN TEST AIRCRAFT AND SURFACE CRAFT
- IN LIAISON WITH CTG 7.5 ESTABLISH REQUIREMENTS FOR BASE AND TEST FACILITIES AND INFORM CJTF SEVEN OF SIGNIFICANT REQUIREMENTS AFFECTING HIS OVERALL MISSION
- PROVIDE CJTF SEVEN WITH DETAILS OF SCIENTIFIC PROGRAMS INVOLVING MILITARY PARTICIPATION

KEY PERSONNEL

- | | |
|--|---------------------------------------|
| DR. W. E. OGLE, Commander | MR. S. H. ELLISON, TU-3 |
| DR. D. C. SEWELL, Deputy for UCRL | DR. H. G. HOLLOWAY, TU-4 |
| MR. D. CURRY, JR., Deputy for Administration | DR. J. C. CLARK, TU-6 |
| DR. R. C. SMITH, Classification | MAJOR J. D. SERVIS, USA, TU-7 |
| MR. A. W. KELLY, J-1 | MR. L. M. GARDNER, TU-8 |
| COLONEL P. L. HOOPER, USA, J-3 | LT. COLONEL J. L. GAYLORD, USAF, TU-9 |
| MR. R. J. VAN GEMERT, J-4 | DR. A. J. HUGGINS, TU-12 |
| MR. R. H. CAMPBELL, J-6 | COLONEL H. K. GILBERT, USAF, TU-13 |
| DR. R. L. AAMODT, TU-1 | MR. P. BYERLY, TU-14 |
| DR. H. L. JOHNSTON, TU-2 | MR. H. E. GRIER, TU-15 |

APPENDIX C

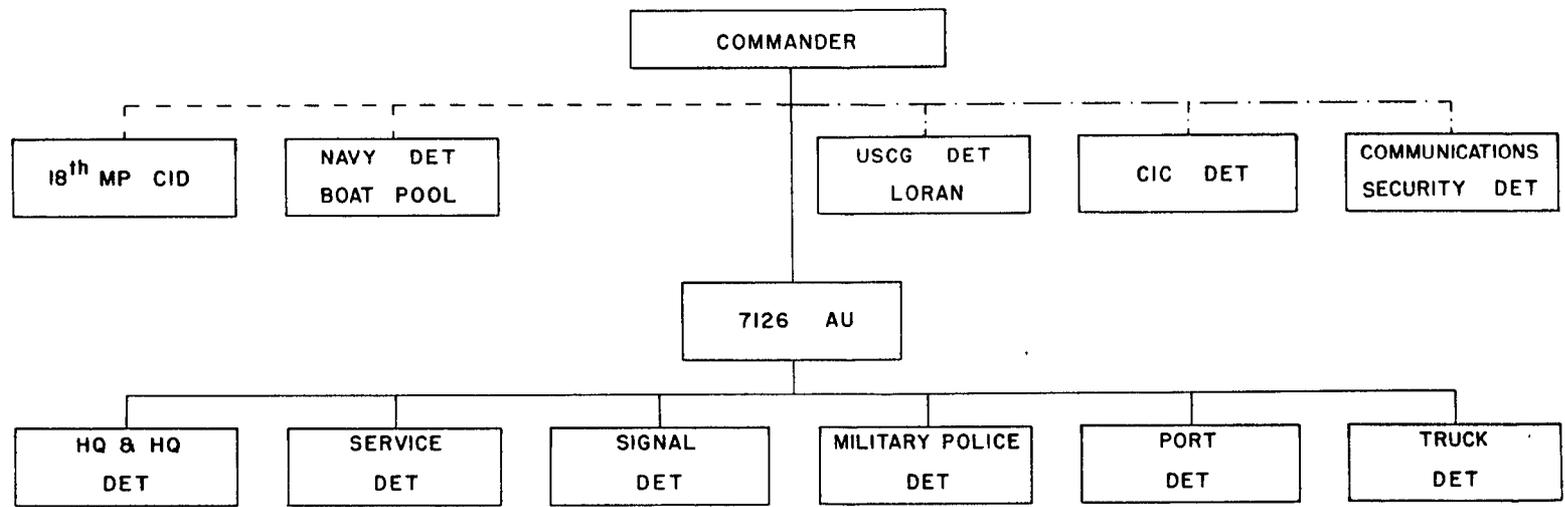
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TASK GROUP 7.2

ARMY

ORGANIZATION

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APPENDIX D

LEGEND:

- - - - OPERATIONAL CONTROL
- . — . BASE FACILITIES SUPPORT
- COMMAND

MISSION

- RENDER NECESSARY SUPPORT TO TASK GROUP 7.1
- PROVIDE LOGISTIC SUPPORT FOR THOSE ELEMENTS OF THE JOINT TASK FORCE BASED ON ENIWETOK ATOLL
- PROVIDE GROUND SECURITY FOR ENIWETOK AND BIKINI ATOLLS
- OPERATE PORT FACILITIES AT ENIWETOK ATOLL
- PROVIDE SIGNAL COMMUNICATIONS AT ENIWETOK AND BIKINI ATOLLS

KEY PERSONNEL

- | | |
|--|---|
| COLONEL E. H. LAHTI, USA, Commander | CAPTAIN R. G. HARNEY, USA, Comptroller |
| LT. COLONEL D. L. BLUE, USA, Executive Officer | CAPTAIN C. E. RAMSBURG, USA, Hq & Hq Detachment |
| MAJOR C. W. MARTIN, USA, S1 | CAPTAIN B. G. STRONG, USA, Service Detachment |
| MAJOR H. E. WANDEL, USA, S2 | MAJOR J. S. GIBSON, USA, M.P. Detachment |
| MAJOR B. J. MALLORY, USA, S3 | CAPTAIN M. KERT, USA, Port Detachment |
| LT. COLONEL W. TROY, USA, S4 | CAPTAIN M.E. BOCKOVERN, USA, Truck Detachment |
| MAJOR M.H. DAKIN, USA, Communications | 1st LT E. H. STEVENS, USA, Signal Detachment |

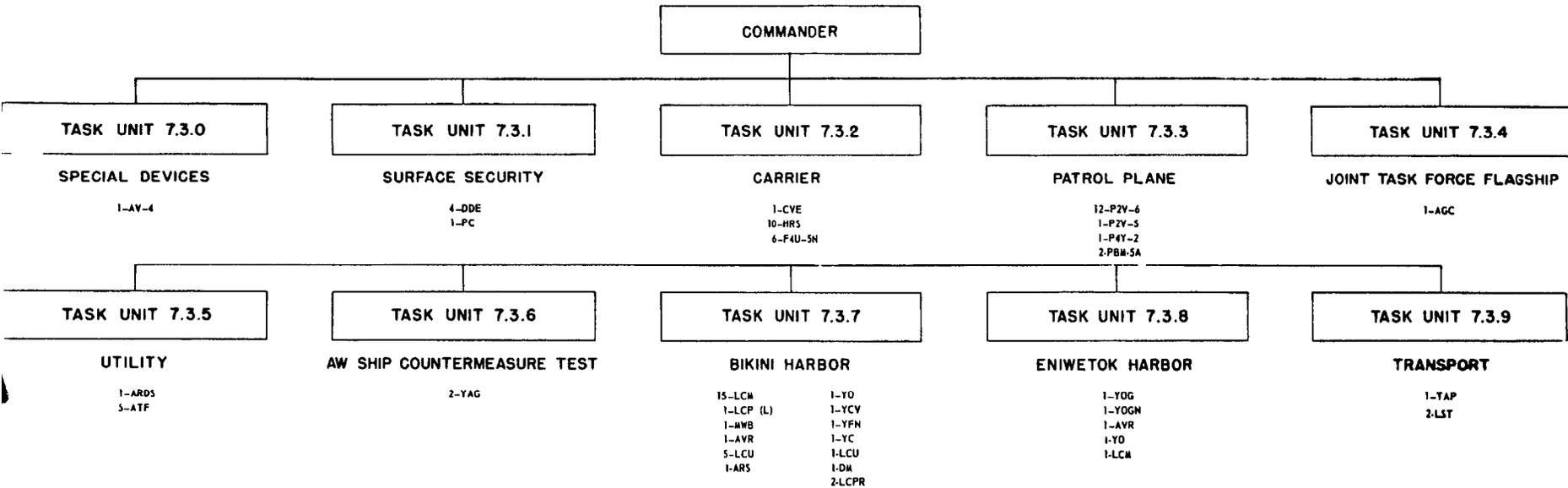
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TASK GROUP 7.3

NAVY

ORGANIZATION

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APPENDIX E

MISSION

PROVIDE AND OPERATE A BOAT POOL AT ENIWETOK AND BIKINI AND AN INTER-ATOLL SURFACE LIFT SYSTEM
 PROVIDE AN INTER-ISLAND HELICOPTER AIRLIFT SYSTEM AT BIKINI
 PROVIDE FOR DELIVERY OF SIGNIFICANT DEVICE COMPONENTS TO THE FORWARD AREA AND BETWEEN ATOLLS
 PROVIDE SHIPBOARD COMMAND FACILITIES, ADMINISTRATIVE SPACE AND COMMUNICATIONS CIRCUITS WHILE CJTF SEVEN IS AFOAAT AT BIKINI
 PROVIDE FOR CONTROL OF THE DRONE VESSELS
 CONTROL HARBOR OPERATIONS AT ENIWETOK AND BIKINI
 PROVIDE FOR THE SECURITY OF THE ENIWETOK-BIKINI DANGER AREA

KEY PERSONNEL

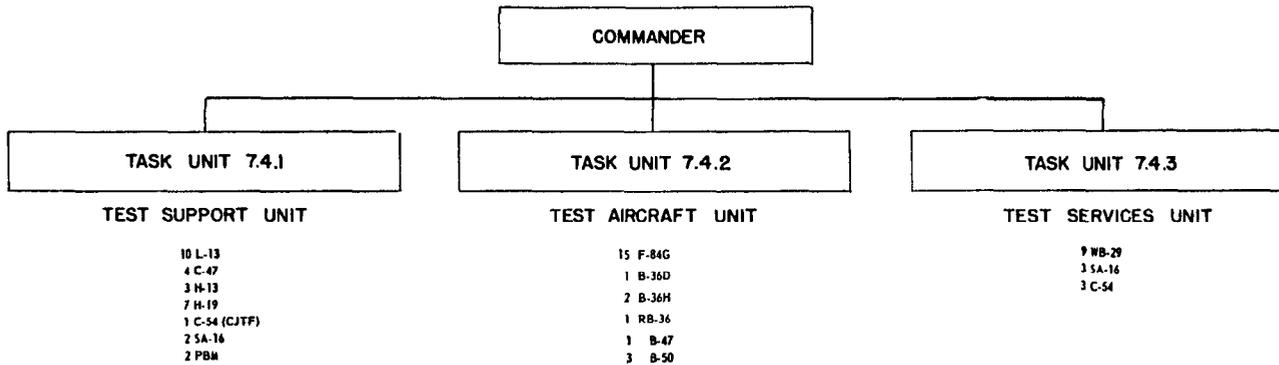
REAR ADMIRAL M. C. BRUTON, USN, Commander	COMMANDER D. BONTECOU, USN, Logistics	COMMANDER W. ARNOLD, USN, TU 7.3.3
CAPTAIN R. RUTHERFORD, USN, Chief of Staff	LCDR J. B. JOHNSON, JR., USN, Communications	CAPTAIN J. W. WATERHOUSE, TU 7.3.4
LCDR A. C. DRAGGE, USN, Administration and Personnel	CAPTAIN R. E. C. JONES, USN, TU 7.3.0	LCDR L. JONES, USN, TU 7.3.5
COMMANDER R. A. KLARE, USNR, Security and Intelligence	CAPTAIN J. E. SMITH, USN, TU 7.3.1	CAPTAIN G. G. WOLUMPHY, USN, TU 7.3.6
COMMANDER M. S. SCHMIDLING, USN, Plans and Operations	CAPTAIN E. O'BEIRNE, USN, TU 7.3.2	COMMANDER C. D. LOWE, USN, TU 7.3.9

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TASK GROUP 7.4

AIR FORCE

ORGANIZATION



MISSION

ASSUME OPERATIONAL CONTROL OF THE INTER-ATOLL AIRLIFT SYSTEM, AND THE INTER-ISLAND AIRLIFT SYSTEM AT ENIWETOK.

EXECUTE MISSIONS OF CLOUD SAMPLING EFFECTS TESTS AIRCRAFT OPERATIONS COMMUNICATIONS SERVICE, SEARCH AND RESCUE, TECHNICAL REPORT PHOTOGRAPHY AIRCRAFT OPERATIONS, WEATHER SERVICE, MATS TERMINAL OPERATIONS AND OFFICIAL OBSERVERS FLIGHTS.

KEY PERSONNEL

BRIGADIER GENERAL H. M. ESTES, USAF, *Commander*
 COLONEL E. W. KESLING, USAF, *Deputy Commander*
 COLONEL H. D. MAHON, USAF, *Chief of Staff*
 LT. COLONEL G. E. FORREST, USAF, *Personnel*

LT. COLONEL P. H. FACKLER, USAF, *Operations*
 LT. COLONEL R. M. HAWLEY, USAF, *Material*
 LT. COLONEL R. S. NUGENT, USAF, *Communications*
 MAJOR H. M. MEADOWS, USAF, *Comptroller*

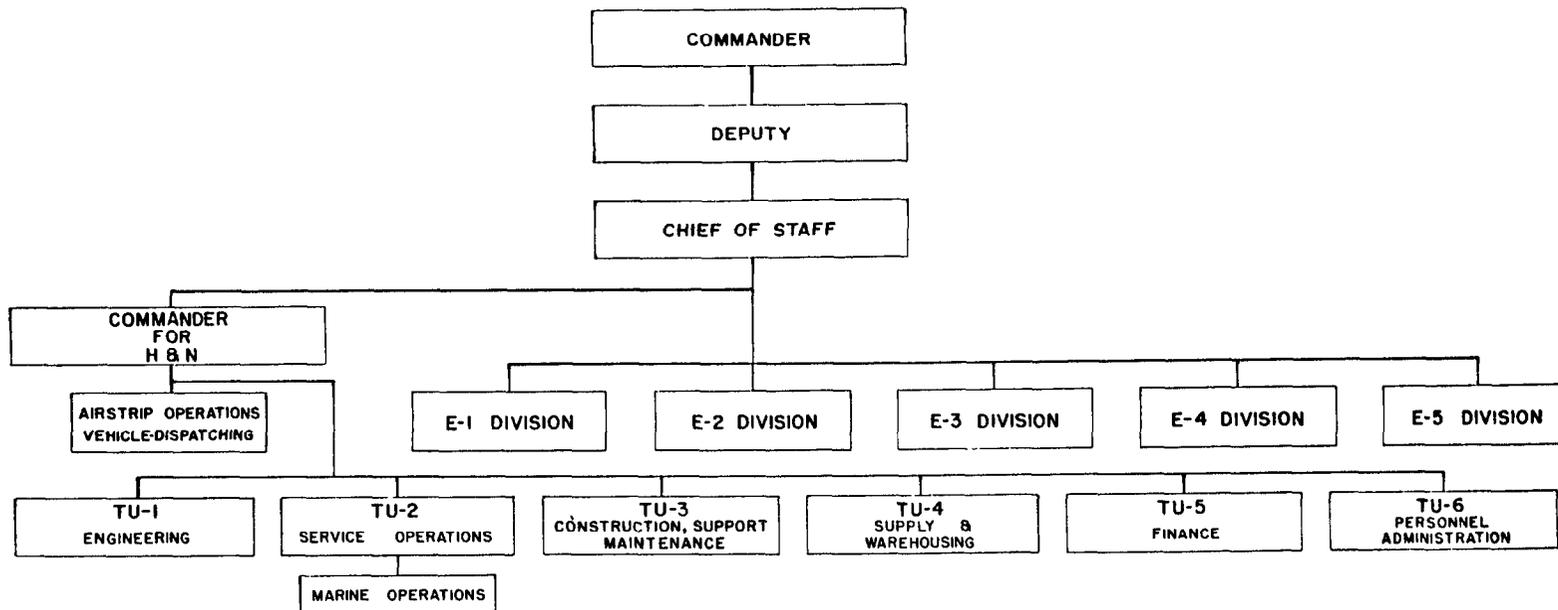
COLONEL J. F. STARKEY, USAF, *Task Unit 7.4.1*
 LT. COLONEL J. A. WATKINS, USAF, *Task Unit 7.4.2*
 LT. COLONEL M. B. HAMMOND, USAF, *Task Unit 7.4.3*

APPENDIX F

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TASK GROUP 7.5

AEC BASE FACILITIES



MISSION

EXECUTE MISSIONS ASSIGNED BY MANAGER SF00 IN ACCORDANCE WITH CURRENT AEC POLICIES
PLAN, CONSTRUCT, OPERATE AND MAINTAIN CERTAIN SPECIFIC INSTALLATIONS AND FACILITIES
AT ENIWETOK AND BIKINI ATOLLS
PROVIDE NECESSARY BASE FACILITIES AND LOGISTIC SUPPORT FOR MILITARY PERSONNEL AT
ENIWETOK AND BIKINI
PROVIDE NECESSARY TEST FACILITIES TO MEET THE SCIENTIFIC REQUIREMENTS

KEY PERSONNEL

MR. J. E. REEVES, Commander
MR. P. W. SPAIN, Deputy Commander
MR. C. A. GORIS, E-1, Administration
MR. W. R. ADAIR, E-2, Security
MR. M. A. REX, E-3, Operations
MR. E. WYNKOOP, E-4, Engin, Constr and Logistics
MR. J. A. SUGDEM, E-5, Communications

MR. C. L. CORAY, H&N, Commander
MR. R. A. BOETTCHER, TU-1
MR. L. CORMAN, TU-2
MR. E. JEFFCOAT, TU-3
MR. R. BURBANK, TU-4
MR. S. SCHMIDT, TU-5
MR. D. W. BULLOCK, TU-6

APPENDIX G

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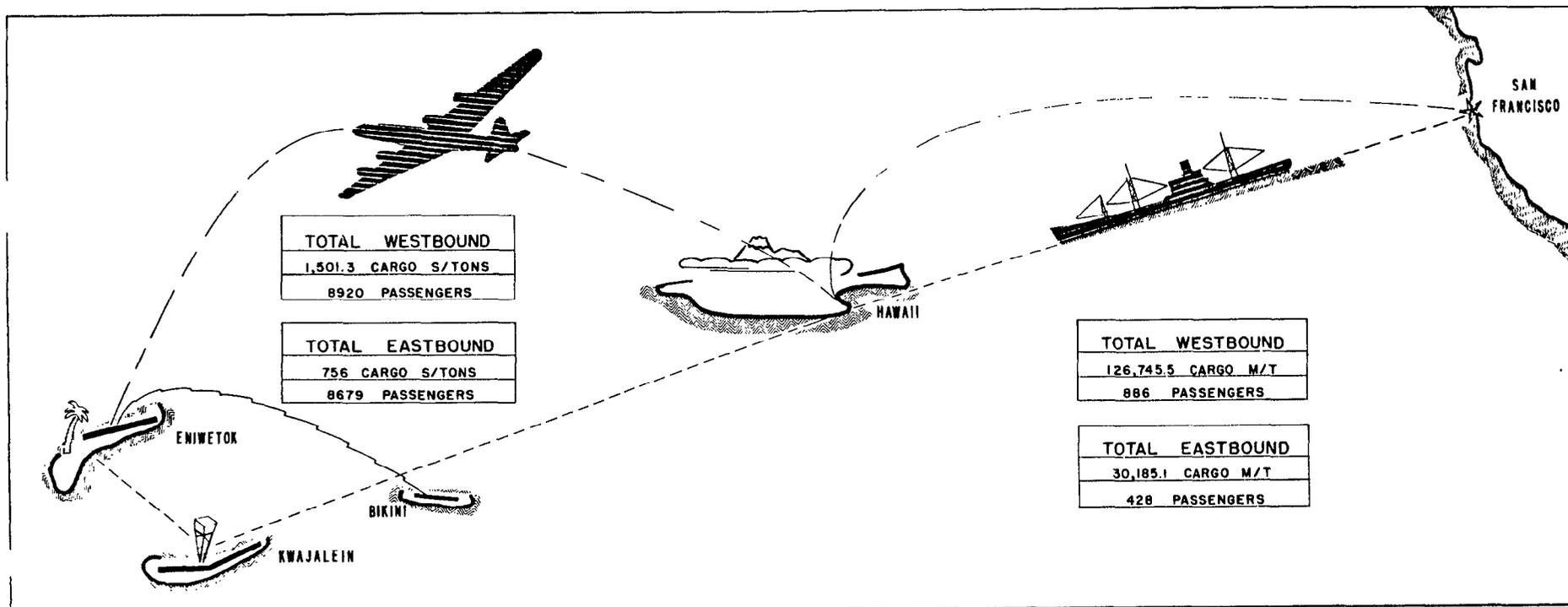
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SURFACE AND AIR LOGISTICAL SUPPORT

OPERATION CASTLE

31 30



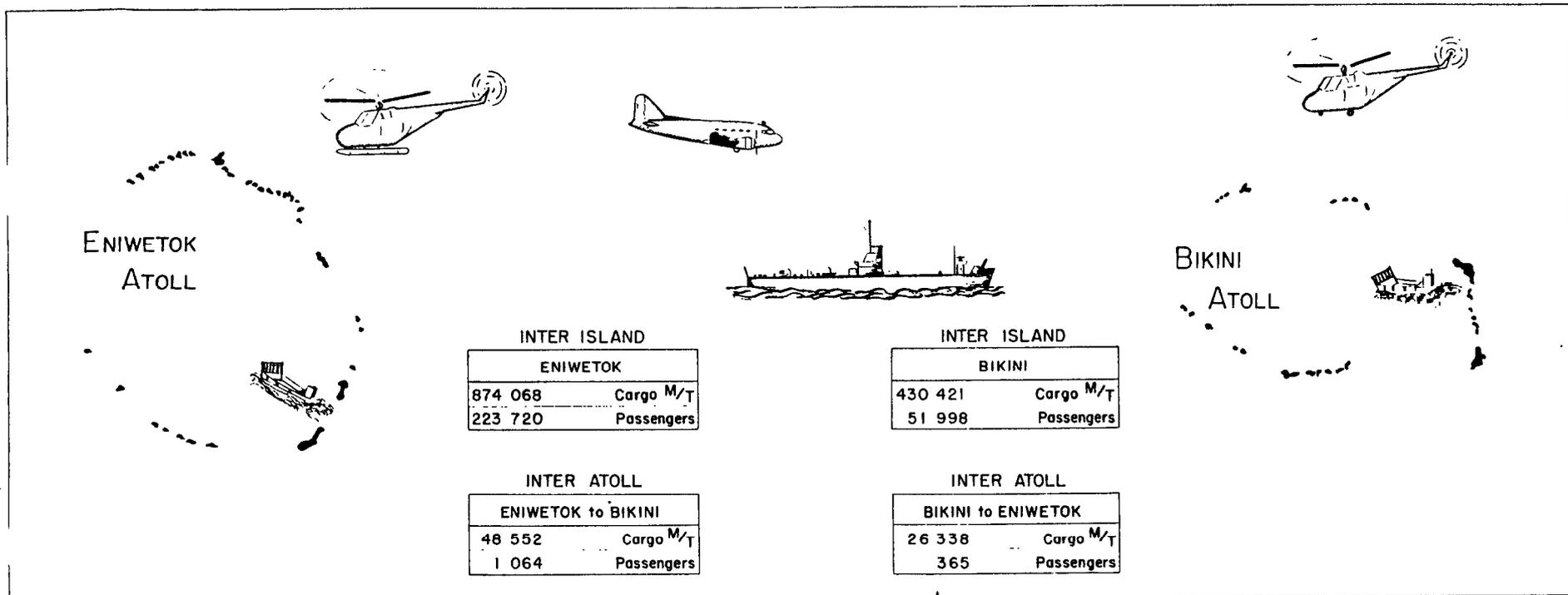
APPENDIX I

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	ESTIMATE MAY
WATER M/TONS	EAST	2167.6	1909.8	78	2028.8	592.8	461	692.9	256.2	281.5	577.7	46.7	694.4	263.3	83	2755	196.4	17,100
	WEST	4095.7	704.2	6710.3	4961.7	1151.4	14254.6	8116.5	8966.8	11143.9	10242.3	16952.4	8390.6	9283.1	3213.9	5527	9031.1	4000
	TOTAL	6263.3	2614.0	6788.3	6990.5	1744.2	14715.6	8809.4	9223.0	11425.4	10820.0	16999.1	9085.0	9546.4	3296.9	8282	9227.5	21100
AIR SHORT TONS	EAST	3	15.8	20.6	19.4	13.7	16.6	33.9	20.7	20.7	18.5	27.8	26.5	40.4	47.2	153.5	176.7	10.1
	WEST	41.8	73.3	46.5	29	47.8	29.8	51.9	54.3	47.2	78.7	101.9	148.6	149.2	199.3	216.5	135.5	50
	TOTAL	44.8	89.1	67.1	48.4	61.5	46.4	85.8	75.0	67.9	97.2	129.7	175.1	189.6	246.5	370.0	312.2	151

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INTER-ATOLL & INTER-ISLAND LOGISTICAL SUPPORT OPERATION CASTLE

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31



APPENDIX

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	EST MAY
Bikini	Cargo	920	973	906	619	1 372	814	1 589	1 910	960	2 478	845	1 560	3 915	1 711	2 690	1 076	2 000
	Pax	5	16	16	6	12	1	0	10	2	15	0	0	0	0	73	124	85
Eniwetok	Cargo	1 857	1 492	2 644	7 555	5 800	3 250	4 871	3 583	3 141	2 795	3 219	3 427	1 265	1 591	628	234	1 200
	Pax	10	21	28	34	69	35	32	23	24	21	19	0	7	0	466	175	100
Bikini	Cargo	3 455	5 086	11 132	9 187	14 589	17 852	19 446	36 697	36 931	45 380	54 684	62 604	52 449	31 713	22 214	7 002	—
	Pax	2 354	863	1 263	1 784	2 325	2 107	1 167	1 564	2 056	2 532	2 726	4 599	7 436	4 175	10 205	4 842	—
Eniwetok	Cargo	18 089	63 000	50 081	31 443	35 101	38 561	44 409	39 769	61 660	61 053	51 570	56 331	59 748	59 982	64 866	73 405	65 000
	Pax	13 207	6 954	5 807	7 125	7 198	8 899	8 448	9 840	13 239	12 731	14 560	15 113	17 366	19 396	19 555	23 282	21 000

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APPENDIX K

OBLIGATIONS AGAINST DOD EXTRA MILITARY FUNDS AS OF 30 APRIL 1954

	<u>FY 1953</u>	<u>FY 1954</u>	<u>TOTAL</u>
Travel	\$ 53,023.23	\$ 824,958.83	\$ 877,982.06
Transportation of Things	22,819.50	130,460.08	153,279.58
Communications	52,193.38	70,258.79	122,452.17
Task Force Overhead Expenses *	3,168.94	104,410.77	107,579.71
Activation, Modification and Inactivation of Ships	137,100.00	100,702.96	237,802.96
Activation, Modification and Inactivation of Aircraft		86,082.97	86,082.97
Maintenance and Construction of Real Facilities	3,230.94	586,320.00	589,550.94
Documentary Photography		28,928.23	28,928.23
Radiological Safety	1,306.39	24,933.87	26,240.26
Weather Service		5,200.00	5,200.00
Operational and Logistical Support **		412,980.12	412,980.12
Ship Rental		840,000.00	840,000.00
	<u>\$272,842.38</u>	<u>\$3,215,236.62</u>	<u>\$3,488,079.00</u>
POL (Non-operational phase)	84,214.49	626,054.29	710,268.78
TOTAL	<u>\$357,056.87</u>	<u>\$3,841,290.91</u>	<u>\$4,198,347.78</u>

* Includes expenses such as local procurement of equipment, supplies and services not obtainable from the military Services and not otherwise classified.

** Includes procurement of POL during the operational phase.

APPENDIX L

OBLIGATIONS AGAINST DOD RESEARCH AND DEVELOPMENT FUNDS AS OF 31 MARCH 1954

	<u>AUTHORIZED</u>	<u>OBLIGATED</u>	<u>BALANCE</u>
Blast and Shock Measurements	\$1,614,831.60	\$1,334,181.08	\$ 280,650.52
Nuclear Effects	906,249.00	750,121.86	156,127.14
Structures	375,110.00	356,640.41	18,469.59
Test of Service Equipment and Operation	950,278.00	859,104.42	91,173.58
Long Range Detection	357,574.00	189,768.30	167,805.70
Supporting Measurements	119,861.00	97,919.71	21,941.29
Common to Operation	<u>1,616,096.40</u>	<u>271,265.05</u>	<u>1,344,831.35</u>
TOTAL	<u>\$5,940,000.00</u>	<u>\$3,859,000.83</u>	<u>\$2,080,999.17</u>