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**OPERATION
CASTLE**

126856

PACIFIC PROVING GROUNDS

Spring of 1954

REPORT OF COMMANDER , TASK GROUP 7.5

RG 326 US ATOMIC ENERGY
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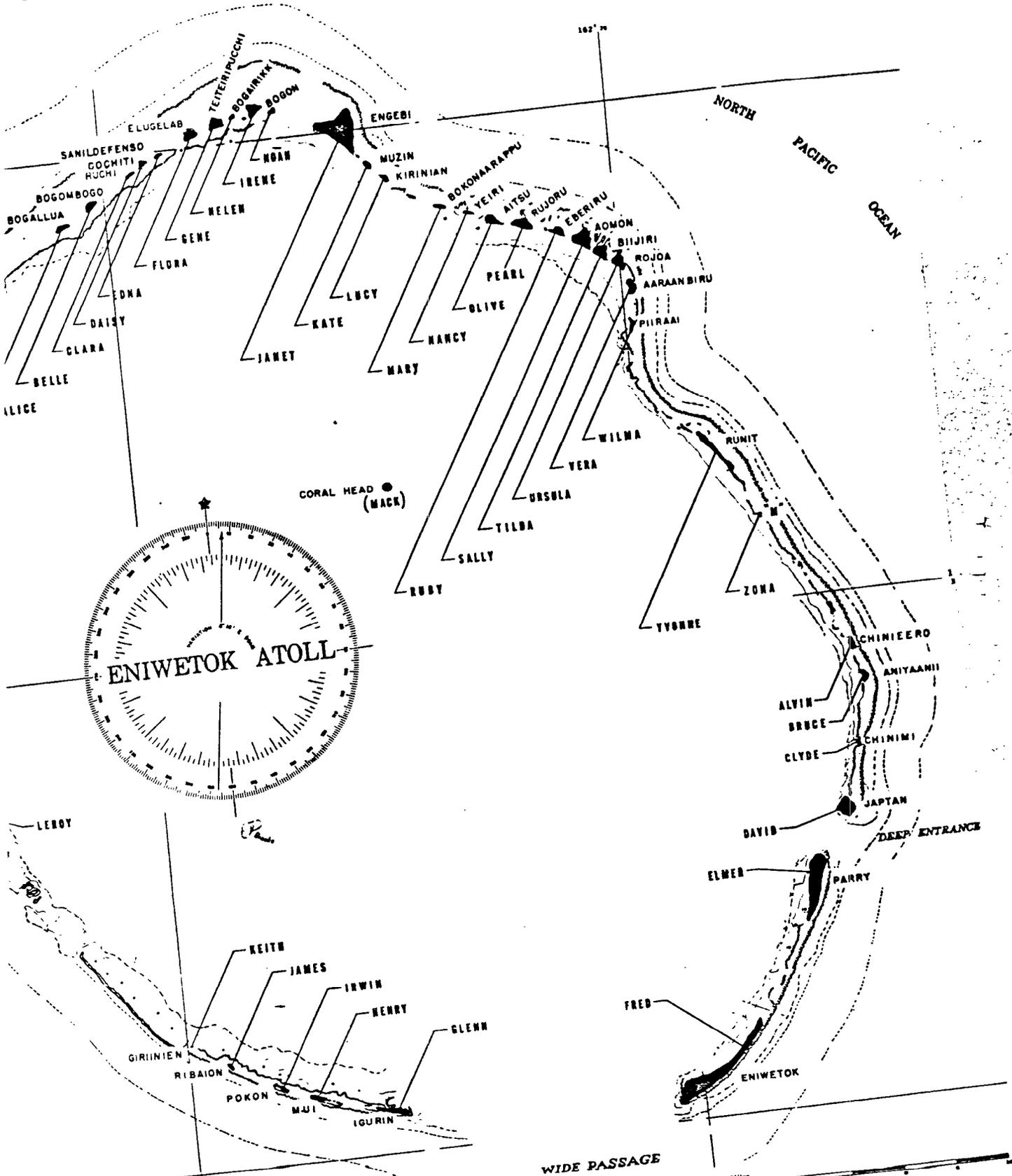
JOINT TASK FORCE 7

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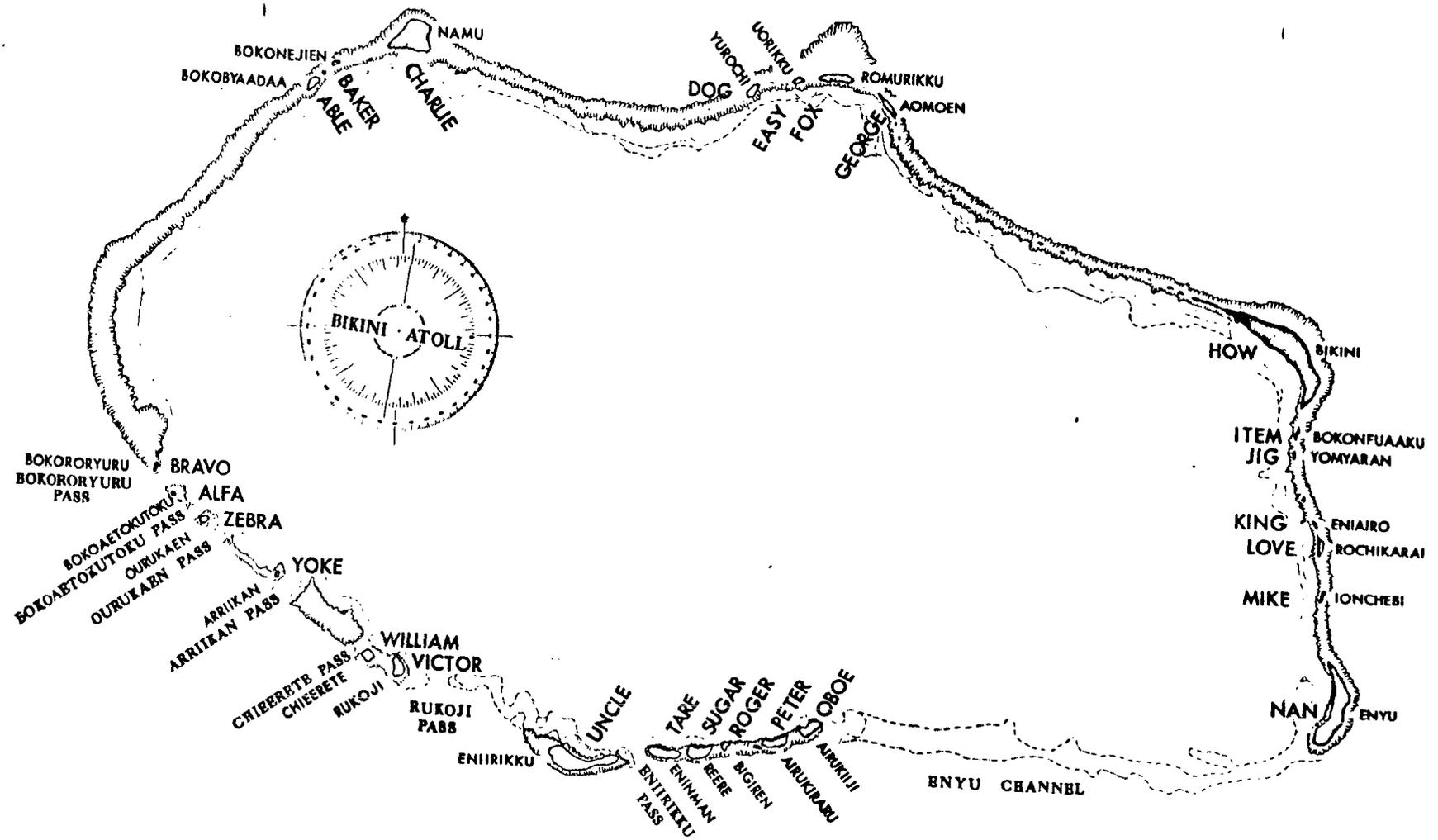


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TASK GROUP 7.5 FINAL REPORT
on
OPERATION CASTLE

PART 1. MISSION

The mission of Task Group 7.5 is to:

- a. Provide all base facilities at the Pacific Proving Grounds necessary to the Task Force and AEC and its contractors in the conduct of test operations.
- b. Provide all structures and related facilities required by the Scientific Task Group for the successful execution of the scientific experiments.
- c. Provide personnel, equipment and materials to support the Scientific Task Group in its on-site operational activities.
- d. Maintain all base facilities at the Pacific Proving Grounds except for the Military communications facilities at Eniwetok Island and Bikini Atoll.
- e. Provide camp and support facilities at the Proving Grounds, including housing, feeding, laundry, medical, recreational and other camp services on all islands except Eniwetok; land transportation and motor pool operation; boat pool operation; utilities operations except Military communication facilities on Eniwetok Island and Bikini Atoll and the POL farm on Eniwetok Island; and warehousing and property accounting for Task Groups 7.5 and 7.1, as requested.

- f. Provide for radiological safety of TG 7.1 and 7.5 personnel in periods between operations.

- g. Formulate and operate a comprehensive security program to cover AEC interest during non-operational periods, and during operations to provide at the proving grounds security servicing for AEC, AEC contractor components, and TG 7.1, in coordination with the staff of JTF SEVEN and AEC Washington.

PART 2. ORGANIZATION AND COMMAND RELATIONSHIPS

For the operational period beginning 15 December 1953, and ending 2 June 1954, the Commander, Joint Task Force SEVEN was designated as Senior Atomic Energy Commission representative at the Pacific Proving Grounds with full authority to act for the Commission in all matters which concerned the successful execution of OPERATION CASTLE. Direct AEC participation in OPERATION CASTLE was represented by Task Group 7.1 which had responsibility for developing, preparing and executing the scientific program and by Task Group 7.5, which had responsibility for providing base facilities, performing necessary construction, supporting the Scientific Task Force with personnel, equipment and material, and administering AEC interests in the Operation and in the Pacific Proving Grounds. Task Group 7.5 was formally activated on 4 March 1953, with Mr. James E. Reeves of the Santa Fe Operations Office, AEC, designated as Commander.

TG 7.5 was a composite organization, personnel being assigned from various offices and divisions of the Santa Fe Operations Office. In

the Operation, Task Group 7.5 was organized along Military lines. Staff positions were filled by personnel of the AEC, whereas the line organization followed closely the normal organizational pattern of the Contractor and was completely manned by Holmes & Narver employees. The principal contributor was the Eniwetok Field Office which had been delegated responsibility by the Manager, SFO, for normal direct and contract activities at the Pacific Proving Grounds. This Field Office accomplished its functions of engineering, design, construction, operation and maintenance through a Contractor, Holmes & Narver, Inc. During the interim period, personnel who constituted the TG staff during the Operation performed, in addition to their normal AEC duties, functions of planning and preparation with coordination being exercised by the Commander, in his capacity of Director of SFO's Office of Test Operations. The Field Manager, Eniwetok Field Office, was Deputy Commander, TG 7.5, for the Operation.

At the time when the AEC transferred its authority to the Task Force Commander, TG 7.5 became operational, the normal duties of its personnel were assimilated into their functions in the TG 7.5 organization, and execution of the previously developed operation plan and the assigned mission became the objectives of the entire Task Group. Upon completion of the operational period, these personnel reverted to their normal functions and concluding operational activities of the Task Group were handled through AEC channels.

During the construction period, the Holmes & Narver organization at the Jobsite reached a maximum of 2,318; during the operational

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period, the total population supported by TG 7.5 reached a maximum of 3,398 on about 1 March and gradually decreased as the Operation drew to a close. The TG 7.5 staff totalled a maximum of 24 people in the operational area. The organization of Task Group 7.5 is shown in Appendix I.

PART 3. PLANNING

Even prior to OPERATION IVY, there was growing concern over the limitations of Eniwetok Atoll for detonation of very high yield thermonuclear devices. As early as May 1952 the Task Force command, the staff of the Los Alamos Scientific Laboratory, and AEC test personnel were investigating the pros and cons of firing very high yield test units at locations other than Eniwetok and the possibility of reactivating Bikini was being discussed. Practicability of utilizing one of several uninhabited islands in the Marshall, Caroline and Mariana Island groups was investigated and a survey of the Bikini Atoll as to its suitability for executing a very high yield detonation was conducted. The conclusion was reached that utilization of Bikini Atoll was most desirable from the standpoint of available land, isolated location, operational efficiency and economy. On 11 September 1952, concurrent with appropriate action with representatives of the Department of Interior and the State Department, the Atomic Energy Commission approved use of Bikini for CASTLE on the basis of minimum possible expenditure in Fiscal Year 1953. The Commission stipulated that there must be no permanent construction at Bikini and that maximum possible economy and use of

temporary and portable equipment must be the rule. Proceeding with beachhead operations at Bikini on 1 October 1952, as proposed, was authorized at the same time.

The development of Bikini Atoll for OPERATION CASTLE is outlined in the Task Force history and will not be repeated here. Suffice it to say that the original concept of a 500-man "shot-island" camp with an airstrip suitable for use by C-47 aircraft and test facilities adequate for detonation of one device evolved into an operational complex involving temporary camp facilities on five different islands of the atoll, with a total capacity of approximately 1,900 people, facilities for interatoll and intra-atoll air and water transportation, extensive radio and telephone communication systems, and scientific structures, control station and timing and firing circuitry adequate for detonation of six test units all in the greater than one megaton range.

In preparation for CASTLE, population estimates indicated that base facilities at Parry Island would need to be expanded to accommodate the number of Task Force personnel who would be in residence. In addition to constructing three warehouses and related operational facilities, TG 7.5 constructed six additional barracks buildings, another wing on the mess hall, and additional administrative office space (refer to Part 5). Pre-operational activities included independent and joint planning with other task groups to adequately provide the personal services which would be required; to assure coordinated air, water and land transportation; to establish acceptable communication facilities; to assure that provision

was made for security of the Operation; and to take necessary advance action on anticipated operational problems so that the effort during the operational period could be directed toward other matters as they arose.

At a conference held during OPERATION IVY, a concept of OPERATION CASTLE was established, proposing a maximum of two very high yield tests and two tests of high yield, with one very high yield device to be detonated at Bikini and the others at Eniwetok. The operational period was scheduled for the fall of 1953. Based on this concept, program and construction planning were initiated in October 1952. Success of IVY tests and projection of these results into the development program prompted the Los Alamos Scientific Laboratory to recommend on 28 November 1952, that CASTLE be expanded to include six tests and that the operational period be delayed from fall 1953 to early spring 1954. This proposal was accepted and on 16 December 1952, Task Group 7.1 issued an "Operational Concept of Castle" which was usable for planning purposes. At this time, the plan for utilizing barges as zero stations for some test devices was proposed. In October of 1953 a seventh test was added to the Operation.

Aside from the construction and operation of base facilities to accommodate the operational task force at the various locations, major effort of TG 7.5 was directed toward construction of the numerous Scientific Stations and their many inter-related facilities. Extensive changes in plans of the Scientific Task Group as to devices to be tested, location of tests, and whether based on barge

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or ashore introduced delay in planning and executing this scientific construction program. Late receipt of structural criteria on numerous structures complicated an already strenuous schedule for design, procurement of materials and equipment, shipment to the Jobsite, and construction. In September of 1953, an inspection of the status of progress of construction and scientific programs resulted in a decision to defer the date of the first detonation of the series from approximately 15 February 1954 to about 1 March. There was no postponement or delay of any test in the series due to non-availability on schedule of TG 7.5 structures or support services.

PART 4. ENGINEERING AND CONSTRUCTION OF TEMPORARY FACILITIES

GENERAL. The Field Manager, Eniwetok Field Office, U. S. Atomic Energy Commission, authorized Holmes & Narver, Inc. by letter dated 12 June 1952, to make a preliminary reconnaissance and study of Bikini Atoll to determine the possibility of its use as an auxiliary proving ground, and to report their findings. The study was based on the assumption that Bikini Atoll might be used for one or more detonations in a future operation. The report "Auxiliary Proving Ground, Marshall Islands" was submitted to the Field Manager, Eniwetok Field Office, on 2 August 1952. This report was based on existing charts, photographs, aerial reconnaissance of the area, and information obtained from people familiar with the Atoll.

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in frequency to one and four flights per day. Air transportation at Eniwetok Atoll consisted of small liaison planes of the L-13 class plus helicopters supplied and manned by Task Group 7.4, and dispatched by Task Group 7.5. At Bikini, it was determined that support could be provided by helicopters, thus eliminating the necessity for building airstrips at the various sites. Although helicopter support was somewhat inadequate at first, it later proved to be of material assistance because of the craft's ability to land small working parties at isolated locations difficult to approach by water. Minimum cost helicopter mats were provided at the major camp sites.

LAND TRANSPORTATION. A TG 7.5 motor pool was established on Parry, and the dispatching, as well as maintenance, of all vehicles was the responsibility of TG 7.5.

PART 9. EVACUATION AND RE-ENTRY - BIKINI ATOLL

Two practice personnel musters held in February proved beneficial in that the final muster conducted during the evacuation period was an orderly and expeditious procedure.

On the final muster, all Task Force personnel were evacuated from Bikini Atoll by TG 7.3. Men evacuated from Bokobyadaa, Namu and Romurikku were instructed to carry all of their personal effects aboard ship, while men evacuated from Enyu and Eninman were to bring a three-day supply of clothing and personal effects. All minute details of the evacuation were handled by TG 7.5.

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The initial experimental event of OPERATION CASTLE was executed at 0645 hours on 1 March 1954. Due to the widespread destruction at Eninman and Enyu and the high degree of radioactive contamination, pre-test plans for re-entry had to be abandoned. The initial test (Bravo - Station 20) was the only experiment that took place in accordance with the scheduled dates established for this Operation.

The original plans for re-entry called for the re-occupation of Enyu and Eninman, but due to the unfavorable conditions following the Bravo test, the evacuees were sent to Eniwetok Atoll. The men were transported during the night and were put ashore on the following day.

There were 1,330 men evacuated - 200 of TG 7.2 and 7.4, 1130 of TG 7.1 and 7.5. The former were quartered on Eniwetok Island, the latter were quartered on Parry; TG 7.3 personnel remained afloat. Close liaison was necessary between all Task Groups in order to properly feed, clothe and house this sudden influx of population at Eniwetok Atoll. Mess hall schedules were changed; PX operations were altered so the men could replenish personal supplies; recreation centers, beach clubs, etc. were emptied and used for housing.

Due to the existing contamination at Bikini Atoll following the Bravo event, notification was received that future tests would be conducted from aboard ship. All Task Force personnel engaged in additional test preparations were quartered afloat. Permission to disembark for the Atoll was granted for specific work assignments only and was under Rad-Safe control at all times. TG 7.5 personnel

were used to supplement TG 7.3 crews in rendering housekeeping services aboard ship during the evacuation and post-test periods.

PART 10. PERSONNEL PHASING

The problem of supplying adequate personnel to the Jobsite at the right time involved making a series of assumptions and selecting the proper time for starting a recruiting program. In planning for CASTLE, it was assumed that the manpower required would follow the pattern estimated in March of 1953. This original forecast included only total number of men inasmuch as the details of the work to be accomplished were unknown at that time. Furthermore, it was assumed that the number of men required each month for the year following would conform to a certain pattern. From this forecast, an estimate was made of the normal distribution for each level of population. Example: per 1,000 men at the PPG there would normally be so many of each craft and so many in each classification of camp department, etc. It was decided to start a large scale recruiting in May of 1953. It was determined that recruiting should not be started too early; the percentage of men available when needed, after a long waiting period, is not as great as it would be when recruiting is followed by early employment. By the same token, if recruiting was started too late, there would be no way to shorten the time required for security clearance between recruiting and hiring. The facilities and personnel of the California State Employment Service was very effective in reducing to a minimum the number of people who had to be interviewed in the offices of Holmes &

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Narver. For example, during the six-month period between May and October, 1953, 29,385 persons were screened and checked at the CSES office as a result of intensive advertising. Of this number, approximately 75% were eliminated as being unqualified, 9,181 were interviewed in the Contractor's offices and 4,638 were accepted for employment. Of this 4,638, 2,064 were actually hired. The difference had, in the interim between acceptance for hire and receipt of final security clearance, found employment elsewhere, changed their plans due to personal reasons, or were eliminated for security reasons. During this peak period, in order to cover a broader area in the recruiting program, it was necessary to station employment interviewers at San Francisco, San Diego, and Fresno, California to work with the California State Employment Offices in those cities. During this same period, H&N's Honolulu Office expanded their recruiting program to include interviewing at other islands, mainly Hawaii and Maui, in coordination with the Territorial Employment Service. As a result of this intensified recruiting program, the job was staffed essentially as planned in the original program and no serious shortages of men developed.

PART 11. RADIOLOGICAL SAFETY

The over-all responsibility for radiological safety, including monitoring and reporting on exposures, was a Task Force function. At the beginning of OPERATION CASTLE, the Atomic Energy Commission established as the maximum permissible weekly exposure to radiation for AEC personnel at the Pacific Proving Grounds the figure of ~~300~~ No

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I believe that responsibility for overexposure of T₂ was improperly placed on T₂-d-326. We were ignored when we suggested limiting men to 3.0 R so men would not be overexposed. I feel that exposure management would have minimized overexposures.

milliroentgen (0.3r). This amount could be accumulated at a faster rate, provided that in any thirteen-week period the permissible dosage would not exceed 3.9r. In March, 1954, the Commander, Joint Task Force SEVEN, authorized higher limits of exposure for several types of work, establishing different limits for different classifications. In actual practice, it was ~~decided~~ ^{required} that film badges would be turned in to the Rad-Safe group, who would evaluate the film and notify holders of badges of their accumulated exposures. This procedure, plus notification by Rad-Safe to TG 7.5 management whenever an individual had reached an accumulation of radiation equal to 2.5r, was considered to provide assurance that none of TG 7.5 personnel would be exposed beyond allowable limits. However, as a result of unusual contamination at all sites, and the resulting heavy work load imposed upon the Rad-Safe group, there were times during the months of March and April, 1954 when the evaluation of film badges was several days behind actual exposures. As a result of this situation, scheduling of men in contaminated areas ^{against advice of rad-safe} was accomplished without knowledge of their cumulative exposures. Because of this fact, several of TG 7.5's employees ^{a large number (17%)} received exposures in excess of the stated allowance of 3.9r for a thirteen-week period. None of the exposures, however, were excessive to the point of constituting possible impairment to health. Nevertheless, this overexposure caused considerable concern because of the always present problem of employees claiming damage as a result of such overexposure. Other than this one phase, which was beyond

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the control of the Contractor, it was possible to indoctrinate all Contractor employees in adequate Rad-Safe practices.

PART 12. SECURITY AND PUBLIC INFORMATION

PLANNING AND PREOPERATIONAL PHASE (PRIOR TO 1 JANUARY 1954)

ESTABLISHMENT OF PERSONNEL CLEARANCE REQUIREMENTS. By letter dated 14 May 1953 from the Commander, JTF SEVEN, to Commander, Task Group 7.5, all land areas of Eniwetok and Bikini Atolls, with the exception of Eniwetok, Japtan and Bikini Islands, were made limited access areas as of 1 January 1954. The requirement that all members of TG 7.5 would be "Q" cleared by 1 January 1954 is given in JTF SEVEN Security Memorandum No. 4. The date of this action was later extended to 24 January 1954.

PROPOSED PHYSICAL SECURITY. Security Areas. The territorial waters surrounding Eniwetok Atoll were classified as a "Controlled Area" under the jurisdiction of CinCPac with the entrance requirements for personnel, ships, and aircraft set forth in CinCPac directive Serial 020. By TWX from CJTF SEVEN dated 1 July 1953, this directive was modified to include Bikini Atoll.

The proposed Limited and Exclusion Areas based upon information on shot schedule and utilization of plant facilities, as set forth in a letter to CJTF SEVEN from CTG 7.5 dated 6 April 1953, were approved by CJTF SEVEN in a letter to CTG 7.5 dated 14 May 1953. The proposal recommended two limited areas at Eniwetok Atoll, one limited area at Bikini Atoll, four exclusion areas at Eniwetok Atoll, five exclusion

CTU-7 has recommended that TG 7.5 establish rad-safe org. and activities of its own than JTF SEVEN service

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those security badges necessary to accomplish their mission, from the TG 7.5 pass and badge office as early as is operationally practicable in order to increase the efficiency of the badge office operation and to reduce functional cost.

PART 13. NATURAL DISASTER OR HOSTILE ACTION ALERT PLANS

Many directives and bulletins were published by the Joint Task Force Commander, the Atoll Commander, and by TG 7.5 pertaining to plans of action in the event of natural disaster or hostile action. These bulletins described what constitutes natural disaster and placed upon certain elements of the command the responsibility for determining the type of disaster or hostile action that was imminent. The portion of these plans affecting TG 7.5 placed upon it the responsibility to protect and safeguard all security information, equipment, materials and utilities systems against loss, destruction, or compromise. The plans included the protection of personnel to the greatest extent possible by recalling field parties and assigning personnel to pre-arranged areas, alerting medical facilities, and preparing all craft for standby in order that evacuation could be accomplished upon notification from higher authority. These plans are covered in detail in published bulletins and procedures.

CONCLUSIONS AND RECOMMENDATIONS

The fact that OPERATION CASTLE, in spite of its various complexities, proceeded through all of the pre-operational phases

without serious delays and, generally, on schedule can only be attributed to the excellent cooperation between all parties. Although the operational phase was changed completely in scope as a result of the first detonation, the rapid solving of the resulting problems indicates that the existing organizational setup was flexible enough to accommodate such radical changes in plans. There are a few points however, that might be improved upon in another operation in the interests of saving both time and money.

It is apparent that there is some duplication of effort, personnel and facilities, particularly between TG 7.1 and TG 7.5, in fields of administration, construction planning, supply and operations. It is considered that most of this duplication results from previous operations where the Scientific Task Group included the AEC Base Facilities group, and the various areas of responsibility were distributed throughout the Task Group. Recognizing the capabilities of the Base Facilities Task Group, and to relieve the Scientific Task Group of the maximum amount of non-technical functions, it is recommended that discussions already initiated between the Santa Fe Operations Office, AEC, the Los Alamos Scientific Laboratory, and the University of California Radiation Laboratory be continued and expanded toward eliminating such duplication in all ways possible and the transfer of as many non-scientific functions as practicable to TG 7.5.

It is believed that OPERATION CASTLE has clearly indicated a desirability for establishing a non-military Rad-Safe unit within TG 7.5 which would be readily susceptible to interrelation

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with Military Rad-Safe organizations during operational periods but still retain responsibility for the actions of TG 7.5 personnel.

- In future operations, it is recommended that the Field Manager's Rad-Safe Group be maintained as a unit within the Task Force Rad-Safe organization and that this unit continue with the responsibility of TG 7.5 Rad-Safe activities, including maintenance of records. In this connection, it is our intention to train field supervision personnel of the Contractor to do their own monitoring and "policing" of Contractor's personnel so that during any future operation special monitors will not be required by TG 7.5 working parties.

It is our opinion that success of the Operation was again handicapped by an unrealistic public relations policy. It is strongly recommended that public relations aspects of these full-scale tests be fully reviewed and that the Task Force elements, along with interested offices of AEC, develop for consideration by the Department of Defense and the AEC a revised concept of public information activities. In this connection, it is recommended that the official observer and project participant programs be reviewed so as to be more significant and meaningful to designated observers and to reduce the operational problems related to the programs.

- Information regarding progress of operations was received at SFOO by retransmission only with considerable time delay and, in many cases, unsatisfactory coverage. Some agencies, such as Sandia, received direct transmission. No doubt there were many such scientific agencies sending direct transmission to home stations. We

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suggest review of communications operation and control procedures in the forward area, exploring the possibility of transmissions to a central terminal stateside and then distribution to all concerned offices, or complete transmissions to all interested locations and organizations through JTF Headquarters at Eniwetok to avoid partial or incomplete reporting. Better coordination of reporting of information is the objective

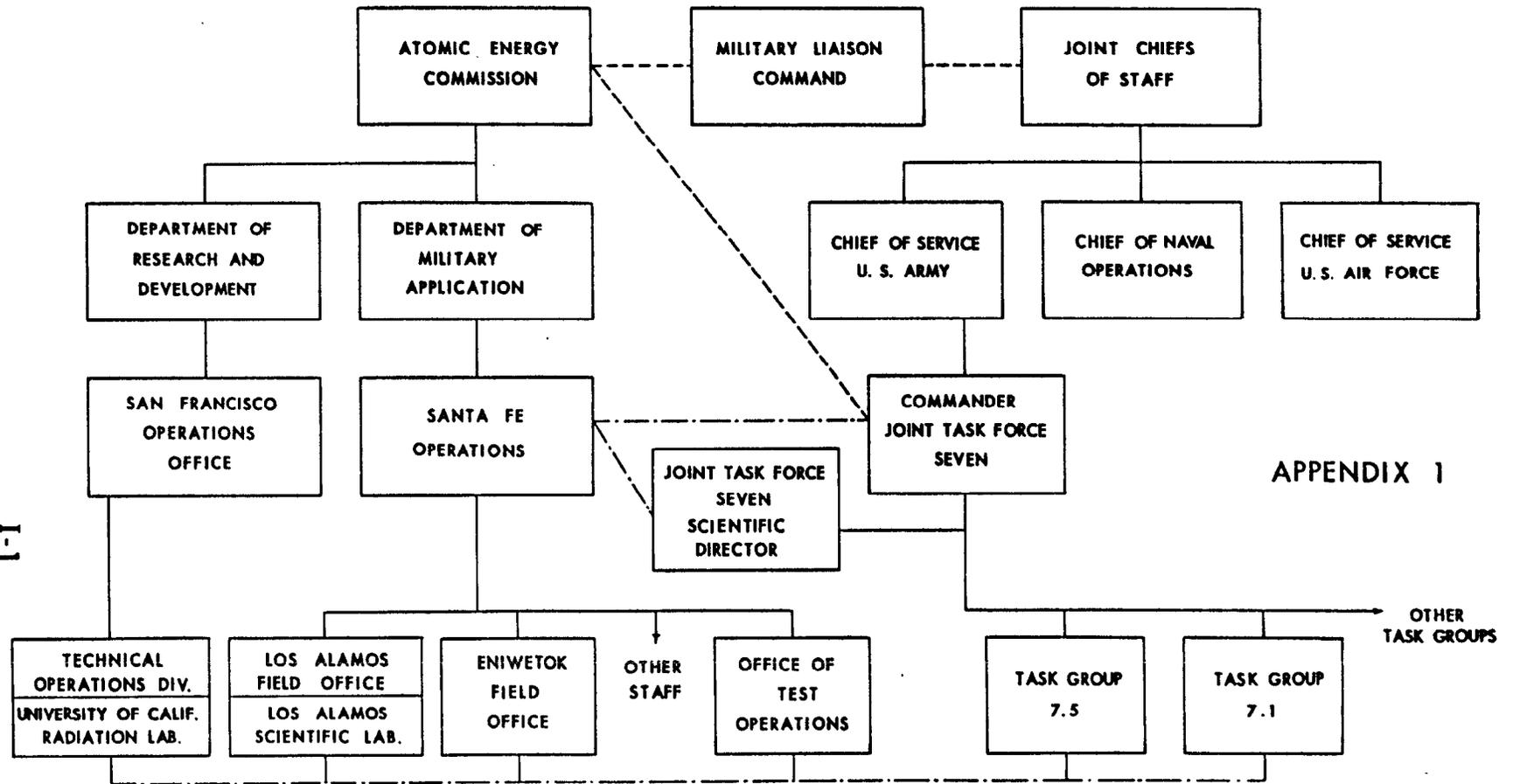
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ORGANIZATION FOR CASTLE ATOMIC ENERGY COMMISSION - JOINT TASK FORCE SEVEN



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APPENDIX 1

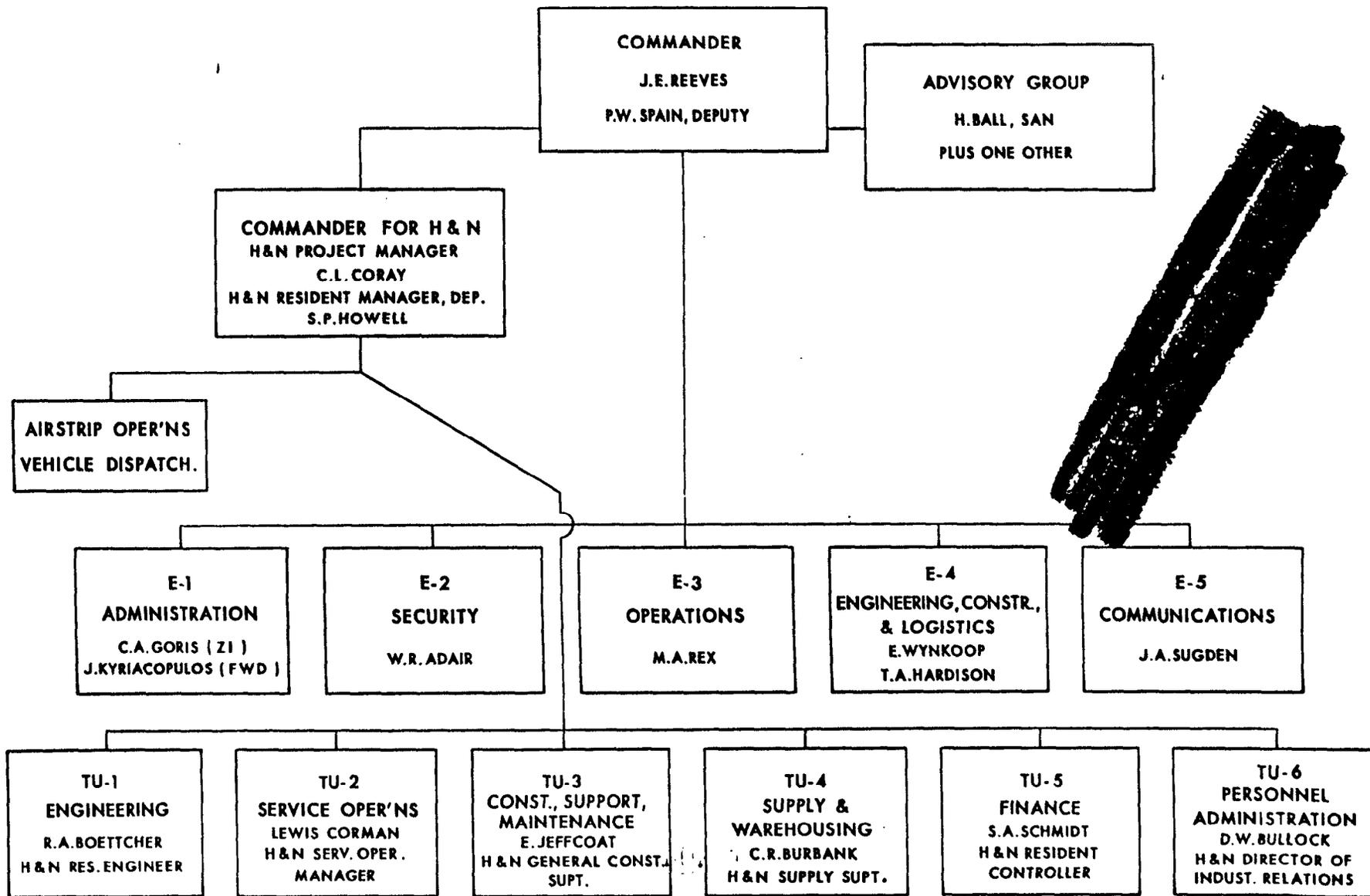
LEGEND

- - - - - Liaison
- . - . - Operational Planning
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NOTE: At agreed date for beginning of Operational Phase, AEC formally transfers to JTF SEVEN full AEC authority for execution of Operation Castle. Corresponding authority over activities at the Pacific Proving Grounds is withdrawn from the Manager, SFO.

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