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ROUGH DRAFT

HEADQUARTERS
TASK GROUP 7.1
Joint Task Force SEVEN
P. O. Box 1663
Los Alamos, New Mexico

411440

28 January 1957

I/1991

SUBJECT: TAONGI Atoll (U)

TO: Distribution

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I PROBLEM

1. To examine the various conditions and implications of developing a firing facility at TAONGI Atoll under the following three separate situations:

   a. That TAONGI is included in the EPG merely as a third site.

   b. That TAONGI is included as a third site while the Bikini site is restricted as NTS is for PLUMBBOB.

   c. That TAONGI is added to EPG while BIKINI is completely inactive.

II ASSUMPTIONS

1. Governmental approval for use of TAONGI Atoll has been given.

2. TAONGI Atoll is the only site available in the event the EPG must be expanded.

3. The first detonation of Operation HARDTACK will occur no earlier than 1 May 1958, probably on 1 June 1958.

4. The natives will have been repatriated on the atolls east of BIKINI.

5. HARDTACK will be similar in scope to REDWING, i.e., the number of shots, etc.

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6. A minimum of two sites to fire large shots is required although this may not necessitate two atolls.

7. The wind patterns at TAONGI Atoll permit the implementation of a fairly rapid firing schedule of approximately one shot every five (5) to eight (8) days.

8. The channel into and in the atoll can be cleared to allow ICU's.

9. Operation of TAONGI Atoll will be within the framework of TG 7.1 as we now know it.

10. If TAONGI Atoll is utilized as a third site, or even in place of BIKINI, its primary user will be UCRL during Operation HARDTACK.

11. If TAONGI Atoll is utilized as a third site, at least a minimum amount of construction will be required on the land mass.

12. The dual capability of firing two (2) large shots (instead of one large and one small as in REDWING) is a requirement.

13. The capability of firing at all three atolls on the same day is not a requirement.

14. As a laboratory, LASL's participation at TAONGI Atoll will be nil under Situation I, but may include participation to varying degrees under Situation II and III.

15. AFSWP's participation ashore at TAONGI will be nil.

16. Sandia Corporation's participation as an experimenter (self-sponsored projects) at TAONGI will be nil.

17. Shots in Group 1 (larger than 2 Mt) can be fired at ENIWETOK Atoll. See Paragraph III, 11, for discussion.

18. Following the first shot the land areas at TAONGI will be contaminated.

19. There will be no area-wide fallout program.

20. The additional funds, personnel and equipment as required by the particular situation will be made available in time to permit development and activation of TAONGI for a May 1, 1958 HARDTACK.

III INFORMATION BEARING ON THE PROBLEM

1. Inclosure 1 is a chart which indicates the relative position of the EPG atolls and the distances between. Distances from TAONGI to other points within the Pacific Ocean area are as follows:

TAONGI

to

GUAM	- 1454 miles
KWAJALEIN	- 356 miles
BIKINI	- 285 miles
ENIWETOK	- 447 miles
WAKE	- 324 miles
HAWAII	- 2024 miles

2. It is expected that the shot series will consist of approximately the following shots:

a. 4-5 surface shots larger than 2 Mt

b. 6-7 surface shots between 0.2 and 2 Mt

c. 8 "small" shots, surface and tower

d. 1 VHA balloon-borne 2 kt shot at 90,000' probably at BIKINI

e. 1 10 kt shot at 150' depth in ENIWETOK lagoon

f. 1 10 kt at 400' depth 6 miles SW of ENIWETOK

g. 1 UHA (250,000') missile-delivered megaton burst probably at BIKINI

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3. Distribution, general locations, and the sponsorship of the shots, for purposes of this study, are as indicated on Inclosure 2. It will be noted that only barge shots will be fired at TAONGI, except under Situation III, and that shots larger than 2 Mt are planned for ENIWETOK.

   a. Under Situation I, it is visualized that barge shots would be conducted at TAONGI and BIKINI on an average firing interval of 10 days (notwithstanding a possible five day capability at TAONGI and a six day capability at BIKINI) and that all small shots are fired at ENIWETOK utilizing RUNIT, ROJOA, and undoubtedly ENGEBI. Estimate the actual length of the firing schedule to be approximately 2 1/2 months. Without TAONGI actual length of the firing schedule might be 3 to 3 1/2 months.

   b. Under Situation II, it is again visualized that the UCRL barge shots would be conducted at TAONGI; however, the six LASL barge shots in groups 1 and 2 would be detonated in the Mike crater at ENIWETOK. Of the eight shots considered for Group 3, which are under 200 kt, it is felt that approximately six are of yields which would permit their being detonated at BIKINI and the remaining two would be fired at ENIWETOK at either RUNIT, ROJOA or ENGEBI. Since BIKINI would be restricted in its firing, it is felt that this situation would cause the actual length of the operation to be increased to approximately three months, the governing factor in this respect being the large shots at ENIWETOK.

   c. Under Situation III, it is proposed that in addition to the six barge shots of UCRL at TAONGI, their four shots in Group 3 which are under 200 kt also be detonated at TAONGI. I believe it is accepted

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that if BIKINI was eliminated from the EPG as visualized in Situation III, the greater development of TAONGI would be necessary. Thus the four tower or surface shots of UCRL would also be detonated first at TAONGI. All LASL shots would be conducted at ENIWETOK. Here again the Mike crater would be utilized for barge shots and RUNIT and FLORIDA for the tower and surface devices. It is estimated that the actual length of the operation would then run approximately four months.

4. Instrumentation for the shots will be similar to REDWING. However, it does not appear that there will be any shot requiring the extensive instrumentation of the REDWING Zuni shot.
5. No area-wide fallout program is currently planned by AFSWP.
6. The Raydist system will not be used but MSQ will probably be used at both ENIWETOK and BIKINI, thereby necessitating a manned station on BIKINI.
7. On the high altitude shots (VHA & UHA) apart from launching, radio tracking and telemetering equipment, AFSWP will require no ground based instrumentation. AFSWP does not intend to fire instrument bearing missiles, but does intend to fly some instruments at 40,000 feet in two B-36 aircraft.
8. The shot series indicated in paragraph 1 above does not include any additional shots removed from the PLUMBBOB series and inserted into HARDTACK. (At present three PLUMBBOB shots have been removed.)
9. UCRL, under their proposal for the use of TAONGI, hopes for a five day firing schedule, but will accept an eight day schedule.

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10. Off-atoll sites, on the JTF SEVEN level, are planned as follows:

a. Weather Stations

(1) TARAWA

(2) KUSAIE

(3) KAPINGAMARANGI

(4) NAURU

(5) RONGERIK

b. RadSafe Stations

(1) WOTHO

(2) UJELANG

(3) UTIRIK

(4) RONGELAP

c. Weather Bureau Stations

(1) TRUK

(2) PONAPE

It is considered that the above would be sufficient and not require augmentation in the event TACNGI was utilized except for the WAKE area as discussed in Paragraph IV, c below.

11. For helicopter and L-20s not in flight it is estimated that they can be subjected to overpressures of .5 to .6 PSI before light damage can be expected. During PLUMBBOB such an effects experiment is being planned so more concrete information on this should be available prior to HARDTACK. Examples of past shots of megaton yields at ENIWETOK indicate that many intangibles enter into overpressures actually encountered. On the Mike shot overpressures of .9 were predicted for PARRY. With a yield of 10.5 Mt, however, .44 and .67 PSI were actually measured on PARRY.

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Three L-13 aircraft parked in the open on ENIWETOK Island were undamaged. For the Apache shot in the Mike crater a yield of 1.8 Mt was produced with overpressures of .35 on PARRY. Utilizing TM23-200, Second Revision, as a reference, it is estimated that at least light damage might be inflicted to helicopter and liaison aircraft parked on ENIWETOK airstrip during 3 Mt or greater devices detonated in the Mike crater. Light damage is defined as damage which does not prevent immediate operational use of aircraft. As may be seen from a comparison of expected overpressure on PARRY from Mike shot and the measured values, some allowances should be made for local weather conditions.

IV DISCUSSION

1. Preliminary to the Operational Phase

a. One of the assumptions made in Paragraph II was that the channel into and in the atoll can be cleared to allow LCU's. Since this is an assumption, the ability to do so is not being questioned. However, it must be pointed out that to accomplish this will require certain things. A survey such as requested by UCRL in letter COL-56-9 of 5 December 1956 is a first and necessary step before proceeding further. The requested air photo mission was turned over to USAF (AFCAT) who in turn passed the request as a training project to FEAF. Probably the mission will be flown by a B-50 out of GUAM. Latest development along this line is that the survey as outlined in COL-56-9, costing some $18,000 is not being conducted. However, Scripps is sending three persons for a three day survey of TAONGI. These persons will go out early in February aboard the ATF which is

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scheduled to go to ENIWETOK. The ATF will remain at TAONGI during the brief survey. No UDT is scheduled to go.

b. Cost of opening the entrance into the TAONGI lagoon and a suitable channel on a minimum basis would be a costly and lengthy operation. This channel would consist of rehabilitation of the existing one which leads from inside the atoll passage eastward into the lagoon for about one-half of a mile, and then southward for about 2 miles and also northward to the selected shot barge site. According to comments of TG 7.3, to permit channel clearance sufficient for operation of up to and including LCU's would be a project well in the million dollar class and would probably take around six months. To attempt a project which would allow access to the lagoon by LSD's, etc., would be prohibitive both in cost and time in the opinion of TG 7.3. Greater detail on this problem will appear in the H&I study currently being prepared.

c. In preparation for the operational phase a new EPG Danger Area would have to be established. The one prescribed for REDWING excluded all land masses except ENIWETOK and BIKINI and on the north stopped just short of WAKE. If the same criteria of establishment should be employed for HARDTACK as for REDWING, WAKE would definitely be in the Danger Area. While air traffic (commerical and military) into and out of WAKE might not be curtailed during shot times, it is certain that WAKE would have to have complete monitoring and evacuation capabilities.

2. Communications

a. During the actual operation and under all three situations, the

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communications requirements at TACNGI would be for all purposes approximately the same. This would be as of the arrival of the instrumented ship. At that time, from the standpoint of personnel (JTF, 7.3, 7.1, etc.) required to be at the site for operational reasons, the shipboard communication system should suffice. Available would be voice, CW, and teletype facilities with acceptable security provisions.

b. As brought out by Walter Gibbins during conference on 3 January 1957, even under the UCRL concept there would be some requirement for a communications structure ashore. Degree of facilities and construction depends on whose opinion is asked. If no sizable pre-operational requirement is present, this facility might consist of just ship-to-shore communication.

c. Throughout the Proving Ground, however, Situation II and III would result in little if any increase in the REDWING communications. Under these two situations the ships previously provided for BIKINI would not be required (ships would not be required for evacuation, but small craft would be needed) and the facilities could be made available to TACNGI. Under Situation II the land based facilities at BIKINI would remain operative but in Situation III this would not be necessary unless BIKINI was utilized logistically.

d. Prior to the arrival of the instrumented ship at TACNGI, if H&N is in the area, some type of communications would be required. Depending upon the effort being expended at TACNGI this might range from communications emanating for a type Station 70 to a plane dispatched daily from KWAJALEIN, BIKINI or ENIWETOK to make periodic contacts

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with the personnel ashore. Greater detail on this aspect can be expected in study being prepared by MCN.

e. From a communications viewpoint and except for necessary pre-operational phase requirements, no great problems are anticipated providing proposed utilization of the atoll remains on the austere basis as planned by UCRL.

3. Airlift and Airstrip

a. No airlift and consequently no airstrip are required by UCRL during the operational phase. However, they did indicate that to have an airstrip would be very convenient if required by TG 7.5 in construction period or by TG 7.4 or TG 7.3 to meet emergencies.

b. TG 7.4 has stated that based on information presently available, they would not require construction of an airstrip at TACNGI.

c. TG 7.3 stated that they had no requirement for an airstrip on TACNGI. They also stated that use of amphibious aircraft to support TACNGI would have to be on an emergency basis. They did not believe routine flights could be made by such aircraft due to hazard of landing and taking off from open water or in the coral head infested lagoon. Clearing a lagoon landing area was not considered practical.

d. If routine airlift support to TACNGI is determined to be necessary, a probable requirement would be the construction of a land airstrip together with adequate navigational aids, control tower, fire fighting equipment, etc.

e. The presence of a minimum number of helicopters in the area would be very advantageous to all task groups before and during the operational phase. By way of a minimum, it is visualized that the number would

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be somewhere in the neighborhood of three or four. To have the helicopters, however, would mean that they would be based aboard a ship where adequate maintenance could be performed. If the instrumented ship was an AV, probably three helicopters could be handled and maintained. If there was a carrier in the area, of course a greater number could be both quartered and maintained. Operationally, in the ship-to-shore movement, the copters would have to be operated part of the time over deep water. This, they have always objected to do even inside the lagoon. Whether or not this objection could be overcome is problematical.

f. During REDWING there were six SA16 assigned with the mission of off-atoll support and SAR. It is known that the JTF SEVEN off-atoll requirements (Weather and RadSafe Stations) are going to be larger. With an additional mission of emergency airlift out of TAONGI, it is estimated that three additional SA16's would be required.

g. In summary, it appears that if TG 7.5 (H&N) requires an airstrip on TAONGI because of construction, etc., that its availability during the shot series will be advantageous to all task groups. However, if not required by H&N, the construction of an airstrip as an emergency facility is not required.

4. Ships and Smaller Craft

a. Ships

(1) No comment is being made at this time as to the number of ships required by TG 7.5 (H&N) during the pre-operational phase or before the arrival of the instrumented ship in the area.

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These requirements will be included in the study presently being prepared by TG 7.5.

(2) From UCRL's proposal for the utilization of TACNGI, we know that TG 7.1 (UCRL) would have a requirement for an instrumented ship. This instrumented ship probably should be of the APA, AKA, hospital ship, or AV type. Such a type ship would have the necessary office and shop space, communications, etc., required by TG 7.1. Comments relative to the ability of this type of ship to house the estimated number of TG 7.1 and TG 7.5 personnel required to be in the area is discussed in a following paragraph on personnel.

(3) There would also be a requirement for at least one and probably two LSD's. How these LSD's would be employed is discussed in a later paragraph on operations. These LSD's would have missions of transporting shot barges from ENIWETOK to TACNGI and also performing as mother ship for the boat pool. In addition, use would be made of its quartering facilities for personnel.

(4) While it is not conceived that there would be any specific mission for a ship such as an ATF, it is felt for insurance reasons that at least one ATF should be included in the ships present at TACNGI.

(5) Both JTF SEVEN and TG 7.3 have indicated that if TACNGI was a firing site, they would have a requirement for a command ship such as the ESTES was at BIKINI. This would be probably either an AGC or a carrier. In addition to having a command ship serve as the flagship for JTF SEVEN and TG 7.3, it would also base the AOC required by TG 7.4.

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(6) Since an airstrip, if constructed, might be unuseable after the first shot, it is felt that a comparatively fast ship such as an APD must be available for inter-atoll transportation.

b. Small Craft

(1) Unless an AKA was provided as the instrumented ship, there would be no ship in the Naval array at TAGFGI capable of lifting to its deck even an LCM. Therefore, during shot periods the small craft would be loaded in the well deck of the LSD acting as the boat pool base. An LSD can load in its well deck 21 LCM's or three LCU's. It would seem inadvisable to include LCM's in the TAGFGI boat pool as TG 7.3 does not consider them suitable craft for operating in the open sea. In addition, any M-boats that you might have would have to be included at the sacrifice of LCU's. Because of its movement requirements, a second LSD would not permit increase of LCU's.

DOE b(3) Illegible Not Reviewed DELETED DELETED

Included in the boat pool would be a requirement for approximately four to six DUKW's. These DUKW's, of course, could be employed only inside the lagoon. With no copter barge, no landing platform on the shot barge, one may find the lagoon too rough for movement from the shot barge to shore by DUKW. In this case, it may be desireable to have two to four Motor Whale Boats for general utility service to the shot barge. If so, an improvised landing pier on the shore would have to be provided.

5. Navigational Aids

a. In the event that a fully operating airstrip was constructed and

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5. Navigational Aids

a. In the event that a fully operating airstrip was constructed and

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utilized on TAONGI, it is felt that there would definitely be a requirement for a homing beacon installation.

b. However, if there was no airstrip constructed on TAONGI, both TG 7.3 and TG 7.4 have indicated that about all they would need as either air or sea navigational aids would be the presence of a Christmas Tree type radar reflector on TAONGI.

c. Channel and sea drone buoys would be advisable in case seaplane operations are required.

6. Concept of Operations

a. In discussing the TAONGI concept with TG 7.3, they indicated much concern in regard to the risks of unloading the shot barge from the LSD in the open sea, and the probable infrequency of suitable sea conditions for such an operation. They indicated that the LSD would generally be about an hours run from the TAONGI passageway for an LCU. They felt that it would be an extremely dangerous operation and in violation of good seamanship to try to dispatch the shot barge from an LSD at that distance and to try to tow it by T-boats to its mooring inside the lagoon. Even at BIKINI, where the shot barge is dispatched in the lea of BIKINI Island where the calmest waters in the lagoon occur, TG 7.3 always had an ATF standing by. In this case, however, they feel that using an ATF or ATF's would be just as hazardous. Since the ATF's could not tow the barge into the lagoon, there would necessarily have to be a transfer made from the ATF's to T-boats again in the open sea. All in all, they felt that this problem of moving the shot barge from the LSD to its position was one on which considerable thought would have to be

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given. [redacted]

b. In a preceding paragraph we indicated that there would be a requirement for one and probably two LSD's. UCRL has indicated that they are desirous of having the capability of implementing a five day firing schedule. With one LSD, under any conditions, it is found that this is impossible to do. Inclosure 3 shows diagramatically the movement of one and two LSD's from the TAONGI area to ENIWETOK and return with a shot barge. Contingencies such as the fact that a boat can negotiate the TAONGI passage only during slack water which is four hours during daylight and four hours at night, no delays for adverse sea or weather conditions, or technical or timing delays having not been considered or included. With one LSD and allowing a minimum of time for check-out of the device on the shot barge, it is estimated that no better than an eight day firing cycle could be maintained. With two LSD's, one LSD could be dispatched to ENIWETOK soon after it had discharged its previous shot barge. Its movement would not be curtailed or governed by any requirement on the part of the boat pool or by radiological conditions. With two LSD's, it is estimated that the five day firing cycle desired by UCRL could be maintained.

c. As visualized, the T-boats based in the well deck on the LSD during the shot would not be discharged for reentry into the lagoon until such time as the radiological conditions in the lagoon permitted. It was checked with TG 7.3 as to whether or not a helicopter radiological survey of the lagoon would be required before they would permit the craft to reenter. While such a survey would be good, it was not

considered necessary. Aerial survey could be conducted by the P2V's, and in additon, the craft as it entered could be taking continuous readings off the bow. If the lagoon was too hot, it, of course, would back off and await further flushing.

d. Operationally, TG 7.3 felt that no craft larger than a T-boat would ever be able to utilize the lagoon. This would eliminate the entrance of the LSD or the ATF for an operation comparable to that conducted at BIKINI. Even detonating devices on the reef would hold no assurance that another navigable passage into the lagoon had been created for anything larger than T-boats. Presence of underwater crater lips might well prohibit larger ship passage.

7. Personnel and Housing

a. During Walter Gibbins's visit to Los Alamos, he indicated that TG 7.1 (UCRL) would require approximately 50 to 60 persons at TACNGI. In addition, based on his evaluation of the operation approximately 115 to 125 TG 7.5 persons would be required. In the event that the instrumented ship was an AV, the majority of them could be housed aboard that ship. As an example, the CURTISS has approximately 70 cabin spaces. In addition, some portion of the estimated 175 TG 7.1 and TG 7.5 personnel could be accommodated by troop space. Personnel which could not be accommodated about the instrumented ship could be quartered aboard the LSD being used as the Boat Pool ship (10 or 12 cabin spaces, ample troop space).

b. The personnel requirement was discussed with JTF SEVEN and TG 7.3. While they could make no estimate as to the number of persons required, they both indicated that their requirements would be very

nominal. In this respect, it is felt that the JTF SEVEN flagship probably could assist in meeting any housing requirements of TG 7.1 and TG 7.5.

V CONCLUSIONS:

1. Major Support Items

a. In recapitulation of the major items of support required for TAONGI during the operational period and exclusive of certain H&N requirements such as APL's, it appears that the following constitutes a reasonable listing:

(1) 1 - AGC - JTF SEVEN, TG 7.3 and TG 7.4

(2) 1 - APA, AKA, hospital ship or AV - TG 7.1

(3) 2 - LSD's - barge movements, boat pool

(4) 1 - ATF - TG 7.3

(5) 1 - APD - inter-atoll

(6) 3 - LCU's - boat pool

(7) 6 - DUKW's - boat pool

(8) 3 - Helicopters - TG 7.1

(9) 3 - SA-16

b. Under Situation I where TAONGI would be included as a third site (if BIKINI operational procedures are not changed from REDWING), the bulk of the above support would be additional to that allocated to BIKINI and ENIWETOK. The BIKINI and ENIWETOK requirements should be approximately the same as REDWING. If BIKINI operational procedures are changed, the result would be more nearly like c and d below.

c. Under Situation II and III, where there is no requirement for meeting the contingency of operating afloat at BIKINI, the above would not be

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all additional. However, some of the above might be utilized at ENIWETOK to improve the evacuation capabilities there.

d. Substantially, Situation II and III as compared to REDWING might result in one less carrier, two less ATF's, eleven less helicopters and one additional LSD. If carrier is required at ENIWETOK for evacuation of helicopters and light aircraft it would not result in one less carrier.

e. In the event that Situation II and III were indicated by the AEC, the securing of the major support items is believed to be no problem. With Situation I, however, where considerable additional support items are required it is doubtful if they could be obtained without a very high level decision.

2. Operations

a. Operationally, it is believed that the TAONGI site is subject to many problems and adverse conditions. Among the principle ones are the inability to negotiate the lagoon with anything larger than an LCU and the questionable movement of the barge from LSD to moorings by LCU.

b. Coupling the above with the other problems of limited time access (four hours day and four hours night) to the lagoon, rough seas delaying barge turn around and ship-to-shore movements, wind delays, technical and timing delays, it is my opinion that even with two LSD's one would be very optimistic to get even an eight day firing schedule.

c. The predicted poor exchange rate of the water in the lagoon and the dimensions of the atoll, which is much smaller than ENIWETOK and

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BIKINI, may well cause substantial contamination delays.

d. It is belived that some of the operational disadvantages and delays would be reduced if an airstrip and minimum facilities ashore were provided.

e. The operational disadvantages and the probability of operational delays at TAONGI, compared with ENIWETOK and BIKINI, are obvious.

3 Incls:
1. Diagram of Approximate Air Miles
2. Distribution and General Location of Shots
3. TAONGI LSD Support

E. A. LUCKE
J-3
Plans & Operations

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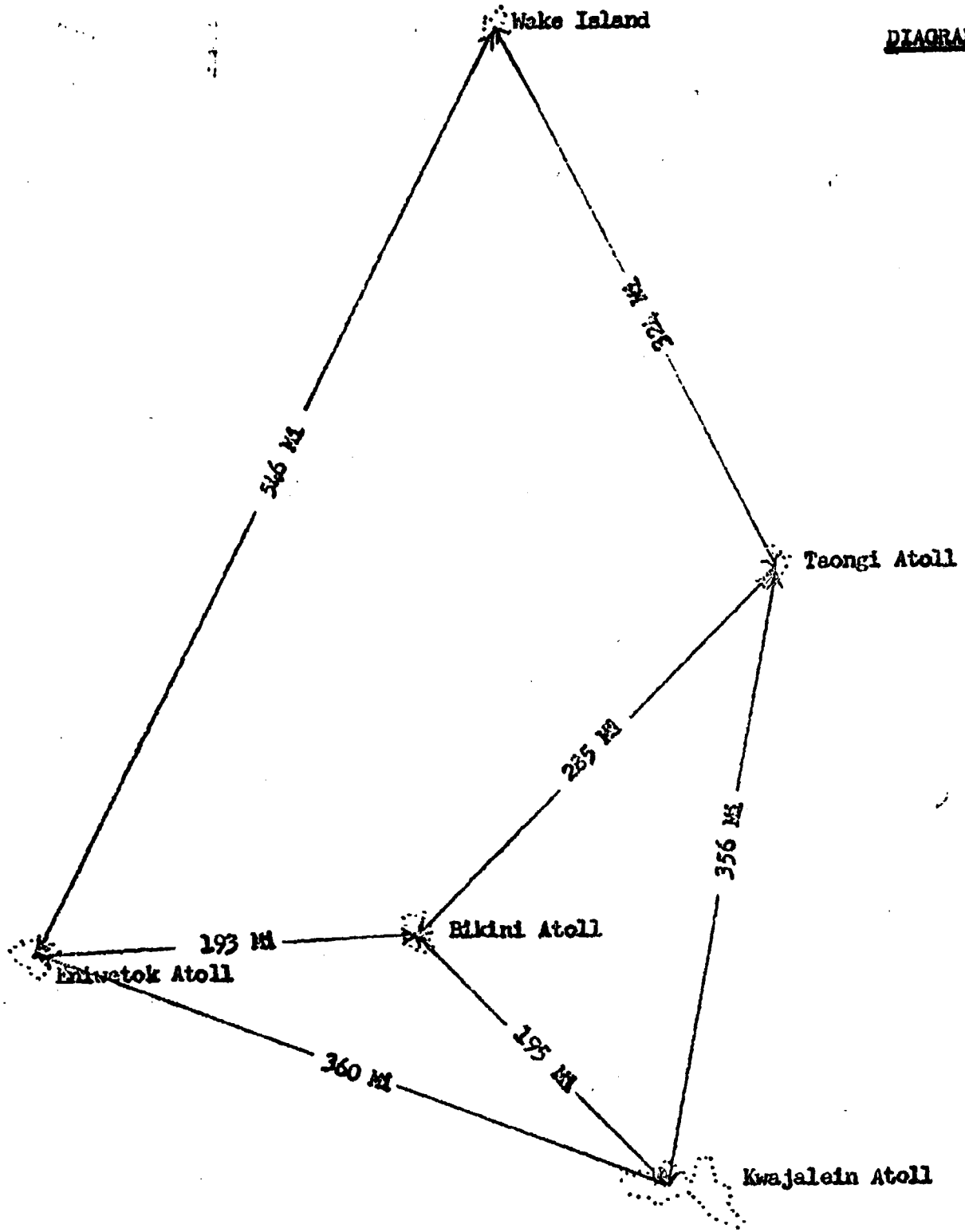

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DISTRIBUTION AND GENERAL LOCATION OF SHOTS

LOCATION	LABORATORY	GROUP	NUMBER
	Situation I		
TAONGI	UCRL	1	3
TAONGI	UCRL	2	3
BIKINI	LASL	1	2
BIKINI	LASL	2	4
BIKINI	DOD	5	2
ENIWETOK	LASL	3	4
ENIWETOK	UCRL	3	4
ENIWETOK	DOD	4	2
	Situation II		
TAONGI	UCRL	1	3
TAONGI	UCRL	2	3
BIKINI	LASL	3	3
BIKINI	UCRL	3	3
BIKINI	DOD	5	2
ENIWETOK	LASL	1	2
ENIWETOK	LASL	2	4
ENIWETOK	LASL	3	1
ENIWETOK	UCRL	3	1
ENIWETOK	DOD	4	2
	Situation III		
TAONGI	UCRL	1	3
TAONGI	UCRL	2	3
TAONGI	UCRL	3	4
ENIWETOK	LASL	1	2
ENIWETOK	LASL	2	4
ENIWETOK	LASL	3	4
ENIWETOK	DOD	4	2
ENIWETOK	DOD	5	2

Group 1 - Over 2 Mt
Group 2 - 200 kt to 2 Mt
Group 3 - Under 200 kt
Group 4 - Under water shots
Group 5 - Aerial shots

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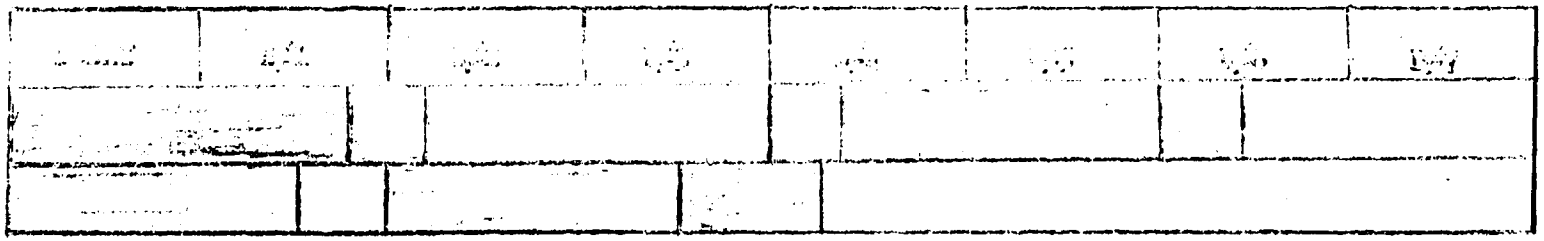
Incl 2



2 LSD's

LSD awaits results of radiological survey before discharging small boats.

Small craft reenter lagoon.

LSD departs for Eniwetok.

Shot barge for next event loaded into LSD.

LSD departs for TAONGI.

LSD arrives at TAONGI. Unloading and mooring of barge starts.

TAONGI LSD SUPPORT

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