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This document consists of 2 pages.

No. 3 of 3, Series 2

Office Memorandum • UNITED STATES GOVERNMENT

TO : Col. Raymond I. Schnittke, Test Branch
Division of Military Application

DATE: MAY 24 1957

FROM : Col. E. A. Blue, DMA Liaison Officer
Mercury, Nevada

SUBJECT: EPG PLANNING MEETING OF MAY 14, 1957(a)

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1. The following notes represent my interpretation of discussions held during the May 14, 1957 meeting at Camp Mercury to consider plans and problems concerning Operation HARDTACK and the use of TAONGI. Enclosure 1 lists persons attending the meeting. Dr. Graves' office is preparing the minutes covering the meeting.
2. Dr. Graves stated that the primary purpose of the meeting was to answer the question: "Is it feasible and desirable to use TAONGI for the 1958 Operation HARDTACK in the Pacific, and if so, what shots should be fired at TAONGI?"
3. Shots to be fired at TAONGI:

Total YieldFission Yield

DGE

4. Plan:

It is planned that the shot barge for the first shot will be towed into the lagoon through a small channel, and anchored near the reef so that the first detonation will open a large channel to be used for entry on ensuing shots. Radiochemical samples will be taken with B-57B aircraft, and B-57Ds when weather permits. Diagnostic information will be obtained from an AEC diagnostic ship. The measurements to be made are:

- a. Fission yield - By Radiochemistry
- b. Ball of fire - From ship
- c. Time interval - From ship
Electromagnetically
Optically and/or Photoelectrically
- d. Try to get primary Alpha - By radio link
(Not optimistic about getting this)
- e. Monitoring information (such as gas pressure and so forth)
By radio link

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MILITARY RESEARCH & APPL 7-EPG

MILITARY RESEARCH & APPL 7-Hardtack

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5. Requirements. The following must be provided if TAONGI is to be used:

a. AEC requirements:

- (1) Provision of diagnostic ship. (Estimated cost to outfit Curtiss - \$1.8 million, to operate Curtiss - \$2.5 million, total \$4.3 million.)
- (2) Open channel 80 to 90 feet wide and 300 to 350 feet in length in reef. Clear coral heads inside lagoon to provide 4 to 5 mile channel to anchorage. (Estimated cost - \$20,000)
- (3) Build sea drome inside lagoon. (Estimated cost - \$50,000)

b. DOD requirements:

- (1) One or two additional weather stations.
- (2) Ships:

	<u>Additional</u> (For TAONGI use)	<u>Total</u> (For Operation HARDTACK)
LSD*	0	1 + 1 part-time for DOD
ATF	1	4 + 4 for DOD underwater shots
DD	4 or 5	8 or 9
LCM	6	24

*If M-Boats need not be evacuated from Bikini on shot day and if M-Boats will be lifted ashore by H&N at Nan for maintenance. If evacuation is required or lift ashore not possible, an additional LSD will be required.

(3) Aircraft:

	<u>Additional</u> (For TAONGI use)	<u>Total</u> (For Operation HARDTACK)
P2V	4	17
PBM	2	2
UF (SA-16)	0	8

- (4) Additional personnel: 1500, plus weather station manning requirements.

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(5) Additional funds: \$3.6 million plus that required to establish weather stations.

C. JTF-7 requirement: \$1.0 million in operating funds.

d. Summary of additional costs for use of TAONGI:

Navy	- \$3.6 million
JTF-7	- 1.0 million
AEC	- 4.5 million
TOTAL	\$9.1 million (approximately)

Conclusions concerning use of TAONGI:

- The firing of shots listed in paragraph 3 above at TAONGI will add safety to Operation HARDTACK.
- Will decrease UCRL field time.
- Will not decrease over-all operation time under present operational plan.
- Will require that no installations be constructed on TAONGI except channel and sea drome. There was some discussion of the need for an emergency air strip 4500 to 5000 feet in length, but the general conclusion was that the limited operational and emergency assistance provided by the short strip probably would not be worth the effort involved in its construction and maintenance.
- Weather stations planned for a Bikini-Eniwetok operation will not suffice for concurrent use of TAONGI. One or two additional stations will be required.

7. Discussion. The following items of discussion are provided to amplify conclusions drawn above:

- Dr. Graves wants to be sure that in using TAONGI we retain the same degree of safety in operation as we have maintained in past operations. The larger Class A and B devices to be fired at TAONGI will require that the firing party stand off at such a distance as to necessitate the use of medium or low frequency radio links for firing rather than the VHF link normally used. The distance for the shot, for planning purposes is about 40 miles. The use of low or medium frequency and the distance involved might make such a system more susceptible to interference and accidental detonation. DOE
- Sam Howell discussed the opening of the channel. He feels that we can take the shot barge in under ideal weather conditions at high tide through an 80 or 90 foot channel in the reef, using an LCU and 2 M-Boats. The channel would have to be 4 to 5 feet deep at high tide, and would have to be 300 to 350 feet in length,

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with about 4 or 5 miles additional length inside the lagoon. He feels that it will not be difficult to clear the coral heads from the channel within the lagoon. To build the reef-channel and clear the lagoon-channel, H&N would need to borrow an LSD from the Navy for about 6 weeks in the Fall of 1957, if possible. He would also use 1 LCU and 2 LCHs from the boat pool at Eniwetok, plus about 40 to 50 tons of dynamite, depending on the type of coral encountered. In clearing the channel he would dynamite the coral and depend upon the scouring action of the water to carry the coral out of the channel. There was a Task Force comment that Navy believes removal of the coral heads from a channel within the lagoon would be a major job. Howell believes that clearance within the lagoon would require only about 3 weeks for the barge channel. There was some discussion of taking the device in on a trailer from the ocean side and securing it upon the reef; but Johnson did not like this idea.

for HARDTACK

- (c) Gen. Luedcke and Col. Wignall stated that an emergency strip might be needed at TAONGI, particularly for use by B-57D samplers. The B-57Ds which would have to fly in from Eniwetok as the closest point would have a limited amount of fuel for activity in the vicinity of TAONGI, and should an emergency occur, might be forced to land locally or the crew might have to bail out. The landing strip would be some 4500 to 5000 feet in length. Sam Howell stated that H&N might complete the strip construction if they could start tomorrow but that it would be doubtful even then. H&N would have to establish a camp on TAONGI which would require building a channel for an LST. The camp would probably be on Sibylla Island and the runway would probably start on this island. To get an LST in the lagoon would require a channel about 300 feet wide by 17 to 18 feet deep. Howell stated that additional funds would not speed up the construction, that the limitation was physical. There was some discussion of the results which might be achieved with such an emergency strip. Col. Parsons stated that landing a B-57 on a short strip, such as that being discussed, would be essentially a controlled crash, and the airplane probably could not be flown off the strip again, but would have to be recovered by ship. The discussion which followed indicated that the landing strip would not be required for HARDTACK, and that its ultimate requirement is doubtful.

- (d) Orin Stopinski stated that the weather observation points needed for the operation, if TAONGI is to be used, include 1 or 2 additional stations. The stations would be aboard destroyers and would be located East of TAONGI. The need for additional stations doesn't necessarily represent a requirement for additional ships for this task alone because Task Group 7.3 will fit out security and other destroyers (DD) to make weather observations, so that ships may be used as dual-purpose. The destroyer weather stations can accomplish essentially the same weather observation and forecasting as can a limited land weather station. Present estimate is that 4 or 5 additional DDs will be required for all purposes if TAONGI is used.

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(e) Graves asked: "If we go to TAONGI, do we have to increase the danger area?" Gen. Starbird stated that it would be best not to increase the danger area if the present is operationally acceptable. There was considerable discussion, following which Johnson recommended that we proceed on the basis that we do not increase the danger area. Gen. Starbird feels that we should not restrict ourselves operationally by limiting the size of the danger area to the East of TAONGI. He feels that we should keep the flexibility in operation that we are gaining by going to TAONGI. If the present danger area would prevent us from shooting to the East under certain weather conditions, it might be best to increase the area. Perhaps we should continue looking at the question and not try to make a decision at present. Gen. Luededke agreed with Gen. Starbird with reference to increasing the danger area if it appears operationally desirable. He pointed out that we do not have the weather catalogued around TAONGI as well as we have it catalogued around Bikini-Eniwetok.

(f) Commander Starrett discussed at length the additional Naval support required to support TAONGI as a third shot site, and commented on the cost of operation of an AEC diagnostic ship such as the Curtiss. The additional Naval support requirement as originally envisioned and some notes on operating a ship of Curtiss type by civilian crew are attached. These papers together with the attached report of surveillance of TAONGI and estimate of task to open channel were given me by Commander Starrett. The latter 2 papers were not specifically discussed at the meeting. Commander Starrett stated that an APA will be used in lieu of the Curtiss for Bikini support, whether or not TAONGI is used in this operation. The Curtiss will be put in moth balls if it is not turned over to AEC for use as a diagnostic ship.

8. In concluding the discussion concerning the use of TAONGI the following remarks were made:

Ogle wishes to go ahead and decide on all of the operation that is independent of TAONGI, so that planning for that portion of the operation may proceed. This would allow all of DOD and LASL plans to move ahead, and would allow UCRL to do some concrete planning. The decisions which may be made now include:

- Rocket shots to be fired off Bikini.
- Underwater shots to be fired off Southern end of Eniwetok.
- LASL shots to be fired at Eniwetok, with possible exception of C.
- UCRL shots other than the 6 listed for TAONGI would be fired at BIKINI.

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Johnson stated that it is okay to agree that LASL shots will be fired at Eniwetok, that the underwater shots are to be fired at Eniwetok, and that rocket shots will be fired at Bikini. He would prefer to state that the UCRL shots will be fired at Bikini and TAONGI or at Bikini. He feels that in absence of a decision on the use of TAONGI, the rocket installations at Bikini should be built to withstand the large UCRL shots (Class A, Class B, and so forth) which would be fired at Bikini if TAONGI isn't used, and some of which might be fired before the DOD rockets are fired.

Gen. Starbird says that DOD/AEC feelings on TAONGI should be firmed up in about 2 weeks but that final approval (State, U. S. Trusteeship Council, OCB, and so forth) probably could not be achieved until July 1. He feels that dual planning must continue until then, otherwise we would have to throw out TAONGI now and go back to the Bikini-Eniwetok concept.

Gen. Luedecke commented on this statement, and agrees essentially with Gen. Starbird's comments.

Johnson stated that in view of his impression that the EPG Planning Board has never been fully sold on the use of TAONGI, and in view of the effort involved in dual planning required to permit consideration of TAONGI and the need to spend time on Plumbbob as well as Hardtack he recommends that we drop TAONGI!!!

Gen. Starbird stated: "That sounds like a man on both sides of a fence if I ever heard one."

Gen. Luedecke stated that if the use of TAONGI was ever worth considering, this consideration is worth continuing to a conclusion.

Gen. Starbird stated that in view of the added safety of the operation with the use of TAONGI, we should continue consideration of its use.

9. There was some additional discussion on Operation Hardtack in general, as follows:

- a. There was some discussion of the extent of thermal effects on Bikini (estimated 10 cal/cm²) which will result from the 100,000 foot high altitude shot of 4 MT. Ogle, Sewell and Parsons each are going to discuss this with some of their people and report findings and recommendations at next meeting.

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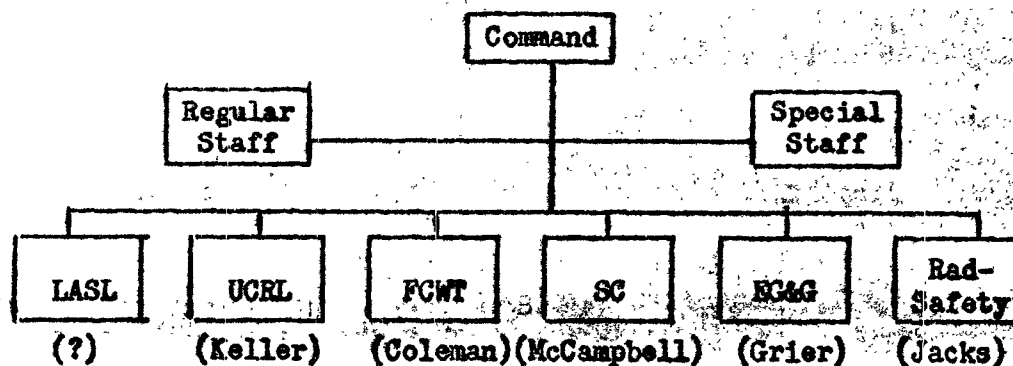
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- b. Gaelen Felt discussed the Hardtack shot list and the organization of Task Group 7.1 and Operation Hardtack. Felt is to work up a tentative shot list including ready dates for Hardtack. This will include the 12 LASL shots, the 10 UCRL shots, and 5 DOD shots. The tentative organization outlined by Felt is as follows:

Organization TG 7.1

- c. Sam Howell stated that H&N has procured basic materials for about 60% of the construction of or improvements to off-island camps at Runit, Aomon, Nan, Howell, Tare, Engebi, Uncle, and Fox. Construction required at these off-island camps will be started as the requirements firm up. Air strip rehabilitation is underway on Runit, Aomon, Engebi and Nan.

Howell says that AEC is opening bids for approximately 12 towers (4000 feet) on May 18, 1957. Procurement has been completed on 20 barges totalling \$1.8 million, to be delivered in FY 1958 starting in August at a rate of 3 per month.

It hasn't been determined as of yet whether DOD or AEC will pay for construction of a bunker on Bikini to be used in the high altitude tests.

Jim Reeves is buying a full IBM 704 for weather and other computations. The equipment is to be installed in the compound at Parry.

Sam Howell recommended and it was agreed that every effort would be made to provide H&N with construction requirements on all major Hardtack projects by July 1, 1957.

- d. Graves asked O'Keefe (EG&G) to begin a study of a system of firing signals for the Class A device, considering a 40 mile stand-off.

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- e. Gen. Starbird asked if the device which will provide megaton fission yields could be put in shallow water. Ogle stated that Dr. Libby was asked about this question and suggested that we put sand in the barges and not require that the device be placed in shallow water or on a reef. Graves stated that if it were required that the device be fired in shallow water, an early decision would be desirable.

10. The next EPG Planning Board meeting is to be scheduled about mid June.

Attachments:

1. List of People Present at Meeting
2. Additional Naval Support required to support third shot site
3. Notes on operating a ship of Curtiss type by civilian crew
4. Report of surveillance of TAONGI Atoll by the U.S.S. Mitchell
5. Estimate of task to open channel into TAONGI Atoll 400' wide and 20' deep

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