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Brig. General Alfred D. Starbird, USA
Director of Military Application, AEC, Washington, D. C.

Original signed by

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UCRL PROPOSAL FOR HARDTACK

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We have reviewed the subject proposal and submit the following comments:

General:

Taongi has previously been considered by the Test Organization as a possible test site. Due to its peculiar location with respect to inhabited islands of the Marshall Islands, it has always been recognized as having distinct advantages from a safety aspect. However, its limited size, unsuitable entrance, and anchorage facilities have weighed against it, particularly from the standpoint of blast and water damage to diagnostic stations and heavy contamination of these facilities.

With the development of methods of obtaining diagnostic data remotely from a diagnostic ship and the apparent willingness of UCRL to forego in certain of the larger shots the detailed diagnostic information, which in the past has been generally considered necessary, it is agreed that reconsideration of the use of Taongi is appropriate.

On the basis of preliminary reports of the Task Force Weather organization and Taongi's geographical location with respect to populated islands in the Marshall Islands, it seems quite obvious that firing from Taongi should be appreciably easier than from Bikini or Eniwetok. Shots can be detonated at Taongi under normal wind conditions, whereas at Bikini it is necessary

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to fire on what might be referred to as abnormal conditions, i.e., with some appreciable wind components from the south. It might be said that we could fire at Taongi under more stable weather conditions and more positive predictable weather conditions. In addition to its superior position with respect to prevailing winds, the increased distances to populated islands are a distinct advantage from the safety aspect for two reasons. First, in case of fallout on any populated areas, the levels will be lower; and second, there will be appreciably more time to take emergency action. The comparable distances for Bikini and Taongi are:

	<u>Bikini</u>	<u>Taongi</u>
Eniwetok	190	475
Rongelap	80	260
Utirik	310	290

We believe there are some features of the UCRL proposal that raise further operational questions. For example, one of the Laboratories finishes its shots and recovery then they contemplate rescheduling and possibly relocation within Eniwetok, Bikini, or Taongi to the best over-all advantage and diminishing of over-all time. Therefore, flexibility in scheduling should be maintained.

We consider the UCRL estimate of time for HARDTACK being equal to REDWING as being overly optimistic. A detonation schedule, even using Taongi, averaging less than three days per shot is questionable. Also, their estimate of damage to result from a 25 - 40 MT shot is open to question. Past experience leads to the conclusion that damage estimates have been both over and under in the results.

We believe that the HARDTACK support requirement of Task Group 7.5 and other Task Force elements will amount to a 25% or 35% increase over REDWING. This is based on a 31-shot series for HARDTACK vs. a 17-shot series for REDWING. However, it is agreed that there will be some offsetting advantages to increased TG 7.5 support requirements for Taongi as a result of decreased evacuation demands at Bikini.

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Taongi would probably be much less usefull to the DOD for effects studies than Bikini. The area available and high contamination probability at Taongi bear out this point.

The Eniwetok Planning Board held its first scheduled meeting on February 26; and, although formal minutes will not be immediately available, representative of this office concluded that the Board generally agreed that:

1. Use of Taongi would almost certainly shorten the operation and probably by about three weeks.
2. From the standpoint of fallout on populated atolls, Taongi is a safer place to fire large shots than Bikini or Eniwetok.
3. Offsetting these advantages are the additional costs in dollars of developing the site; procuring, outfitting, and operating a diagnostic ship; additional weather and other operational support.
4. While the Board agrees that Taongi cannot be considered essential, its use would be advantageous.
5. The Board reaffirms that an early decision on Taongi is necessary.

These conclusions were the result of at least six hours of extensive deliberation by the Board.

Permanentizing Site Nan:

Any development of a permanent base camp at Site Nan should not be predicated on Taongi operations. Rather, this is premised on the separate real estate operations concept. There is good reasoning in the UCRL-LASL desire to separate their operations, indeed, as their laboratories are separate. Operational efficiency and elimination of conflicting interests in site and area utilization would result. We therefore suggest that this subject be considered as separate and apart from the Taongi proposal.

Diagnostic Ship:

It is our opinion that the diagnostic ship should be acquired and controlled by the AEC. There should be no strings on making

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modifications or utilization. Selection (probably of an Escort Carrier type) should be made of a vessel on its way or scheduled for mothballing. The vessel should not be of a type of high potential need by the DOD, such as is the case with a Hospital-type ship. The ship will be jointly manned by Holmes & Narver and MSTC or Ships Company personnel. The acquisition of a diagnostic ship would provide a facility for "quickie" tests of smaller over-all magnitude at less cost than other methods.

Costs:

Even a cursory analysis of the additional costs associated with the establishment of Taongi Atoll as a shot location must give consideration to the fact that resulting savings in operational and maintenance costs would accrue as a result of reduced length of an operational period. Generally, we believe the cost implication to be of not paramount importance, in a properly adjusted perspective. Safety should be foremost and then time savings which cannot be fairly evaluated on cost alone. The Research and Development program has historically had high valuation where time is the essence in program goals.

The cost analysis presented below has, of necessity, been based upon rather general estimates, the validity of which has not been checked in detail. However the basic figure representing the initial development cost of Taongi will be found to be more conservative than as indicated in the UCRL proposal. Against this initial cost of the development of Taongi, we have given consideration to savings resulting from a shortened operational period based upon REDWING experience of incremental costs of proving ground operation and maintenance. We have also included a factor to cover the potential loss of our investment in Man temporary camp facilities in the event the HARDTACK program includes any high yield shot (at Bikini instead of Taongi) of sufficient magnitude to destroy the Man facilities. Currently there is no information available as to operating cost of the diagnostic and firing ship. We have therefore estimated \$550,000 per year, based on \$2,500 a day during an operational period and \$1,000 a day during the remaining interim period. The computation anticipates that the ship will be in operational status approximately 125 days.

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Additional Cost Implications:

- a. Bikini evacuation would be on a contingency (emergency) basis, with transfer of the larger shots to Taongi.
- b. Logistical support would be increased. Full-time operational period LSD support would require two ships, with the part-time support of a third LSD. The operation of the proposed diagnostic ship and its re-supply would be additional. Elimination of evacuation, re-entry, and recovery of Taongi shots, which would be required at Bikini, will offset any boat pool, liaison aircraft, and support cost occasioned by use of Taongi.
- c. The Air Operations of Task Group 7.4 (including the Sea Air Rescue Elements), and the surface operations of Task Group 7.3 would obviously be expanded.
- d. We concur that an airstrip at Taongi is a necessary incidental to original construction and for medical evacuation and should be of future value for emergency landings of operational aircraft and to facilitate future Taongi condition surveys. Amphibious aircraft landing and take-off at Taongi are hazardous and uncertain. Movement of equipment and materials ashore is difficult.

The evaluation of the proposal is necessarily one for DMA and Commission decision. Except for our comments and estimates, insofar as they may differ with the UCRL paper, we concur with the statements contained within the proposal.

Of all the arguments presented in favor of using Taongi as a major firing site in future Pacific operations, it seems obvious that the most compelling one is that of increased safety to both Marshall Island inhabitants and test participants. Now that UCRL has satisfied itself that they can obtain the minimal required diagnostic measurements necessary for their use, the fundamental technical and operational reasons for not having used Taongi in the past no longer exist. It seems to this office that the AEC would be in an almost indefensible position should an

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accident occur in future operations had we not made every effort to obtain approval for the use of Taongi.

The planned utilization of Taongi, if for HARDTACK, obviously calls for prompt consideration and approval. Much of the construction effort would require "crash" scheduling. Costs would be proportionately high. Consequently, values that can only be determined at the DMA and Commission level lead to decision. Should your office consider favorably the use of Taongi, it is recognized that its ultimate approval will not be immediately available, and the following recommendations are submitted on this assumption.

Recommendations:

1. It is recommended that this office be directed to obtain the detailed review and comments of all major participating agencies of the UCRL proposal for ultimate consolidation and submittal to the Planning Board for its consideration.
2. It is recommended that all Pacific test participating organizations be directed to proceed with their planning of HARDTACK on the basis of the use of Taongi.
3. It is recommended that ALO proceed with joint surveys; arrangements for a temporary weather observation station at Taongi; procurement of common use materials; exploration of availability of a suitable diagnostic ship; and preliminary plans and estimates for its procurement and reconfiguration; preliminary arrangements for its re-activation and docking at suitable location.

It is felt that ALO must proceed with all possible action on the supposition that DMA and Commission approval will be received.

We shall execute any further desired action on your advice.

Enclosure:

Cy 1/16A UCRL ltr dtd 2/19/57
w/cy 1/20A Proposal

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