SECRET

22 May 1943

General Mac: Major General L. H. Brown

U-25 - Rec - 1/47

Subject: Summary of Target Committee Meetings on 20 and 21 May 1943

1. The second meeting of the Target Committee convened at 1000 on 20 May in Dr. Oppenheimer's office at Site 3 with the following present:

   General Farrell
   Dr. J. L. Mansfield
   Colonel Seaman
   Dr. J. S. Norwood
   Captain Parham
   Dr. J. C. E. Pringle
   Major Berry
   Dr. H. E. White
   Dr. Tolan
   Dr. Oppenheimer
   Dr. Wilson

   Dr. Beths and Mr. Brad were brought into the meeting for discussion of item 4 of the agenda. During the course of the meeting panels were formed from the committee members and others to serve in the afternoons and develop conclusions to items discussed in the agenda. The concluding meeting was held at 1500 on 21 May in Dr. Oppenheimer's office with the following present:

   Colonel Seaman
   Dr. Stearns
   Captain Parham
   Dr. J. C. G. Pringle
   Major Berry
   Dr. H. E. White
   Dr. Tolan
   Dr. Oppenheimer
   Dr. Wilson

2. The agenda for the meetings presented by Dr. Oppenheimer consisted of the following:

   A. Weight of Fatumer
   B. Report on Weather and Operations
   C. Gadget Nomenclature and Landing
   D. Status of Targets
   E. Psychological Factors in Target Selection
   F. Use Against Military Objectives
   G. Radiological Effects
   H. Coordinated Air Operations

   (continued on next page)
2. The agenda for the meetings --- continued:

I. Revisions

II. Operating Requirements for Safety of Aircrafts

III. Coordination with other Programs

3. Height of Detonation

A. The methods for determining height selection were discussed. It was agreed that conservative figures should be used in determining the height since it is not possible to predict accurately the magnitude of the explosion and since the height can be determined with a reasonable degree of accuracy whereas a detonation is more prone to error. It was agreed that these should be prepared to meet the following possibilities:

(1) For the Little Boy, the detonation heights should correspond to a pressure of 1 psi, a height of the shock wave of 250 feet, and a magnitude of explosion of either 10,000 or 10,000 tons of E.E. equivalent. With present knowledge, the figures corresponding to 3,000 tons equivalent would be used but noting for the other should be available in case were as known at the time of delivery. The heights of detonation corresponding to 2,000 and 3,000 tons are 1,000 feet and 2,000 feet, respectively.

(2) For the Fat Man, the detonation heights should correspond to a pressure of 3 psi, a height of the shock wave of 150 feet, and a magnitude of explosion of 700, 2,000, or 5,000 tons of E.E. equivalent. With present knowledge, the figures would be set at 2,000 tons equivalent but noting for the other values should be available at the time of final delivery. The heights of detonation corresponding to 700, 2,000, and 5,000 tons are 800 feet, 1,000 feet, and 1,500 feet, respectively. These values will be used for this purpose.

B. In the case of the Fat Man, delay circuits are introduced into the unit for other purposes which make the detonation of the bomb 500 feet below the height at which the fuse is set. For this reason as far as the Fat Man is concerned, the fuse settings should be 500 feet, 1,000 feet, or 1,500 feet.

C. In view of the above, it was agreed that the fat Man Unit plans should be available as soon as possible. These delays are 1,000 feet, 1,200 feet, 2,000 feet, and 2,500 feet. With present information, the 3,000 foot delay would be most likely to be used in this Fat Man and the Little Boy. Additional delay time is needed for the Little Boy to be 1,200 feet, or for the Fat Man 500 feet, for this reason some of the units (or none) must be delayed.
4. Report on Training and Operations

A. The Squadron reported on the above subject. The report essentially covered the materials in the 5th Search group of 5th - Operations "Preparation Report on Operational Procedures". For this reason its report will not be repeated here but is attached as an appendix. It was agreed by those present that the mission if at all possible should be a visual bombing mission. For this we should be prepared to wait until there is a good weather forecast in one or more of three alternative targets. There is only a 3% chance in this area that we will have to wait over 100 miles. When the mission does take place there should be another aircraft over each of these alternative targets in order that an alternative target may be selected in the last hour of flight if the weather is unsatisfactory for any of the three targets.

B. In cases the aircraft reaches the target and finds the three targets unsuitable for visual bombing it should return to the base provided it is in good operating condition. Only if the aircraft is in sufficiently bad shape that it is unlikely that it can return to base and make a safe landing or if it is essential that the drop be made that day should the crew be made with radar equipment. For this purpose it may be desirable to have an Eagle radar equipped airplane accompany the mission in order that formation bombing with the Eagle planes in the lead can be made to obtain the increased accuracy from the Eagle. A final decision on the feasibility of this emergency procedure can only be made after further combat experience is obtained with Eagle aircraft. In any case every effort should be made to have the mission such that blind bombing will be unnecessary.

C. It was agreed that Dr. Stearns and Dr. Sisson should keep themselves continuously informed as to radar developments. If at any time new developments are available which show a marked improvement of accuracy the basic plan may be altered.

D. It was agreed that Stearns was a very promising development for the 5th Bomber Group but that we should make no plans to use Stearns until its success is fully confirmed in normal bombing missions in that area.

E. The plan to use the gadget with visual bombing even though this may require a one day to three weeks delay requires that the gadget be made such that for a period of about three weeks it can be held in storage in such a state that on twelve hours notice it can be prepared for a combat mission. No difficulty in this regard was foreseen by those present.

7. Combat Procedures and Loading

A. It was agreed that if a unit has returned to base with the gadget and if it is in good condition other than its present state of storage, it is to be returned to the base with the gadget and with the gadget equipment being kept in readiness on the ground. This operation will certainly involve some risk to the gadget and to the gadget equipment. The gadget has been carefully packed in its field. However, the chance of a crash when the aircraft is in good condition and the chance of damage to the gadget during a crash initiating the gadget, even when both gadgets are both sufficiently safe that it was the risk of those present that the gadget equipment for the unit under these circumstances was a justifiable risk. Frequent deliveries to units and E.S. released units have been made in the past. Training in loading the gadget unit should be given to all men who can be directly involved.

REMARKS AND NOTES

RELATIONSHIP

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4. During interception and landing, continued.

5. In some aircraft returns to the base at night time, the conditions may not be suitable for landing in a normal holding pattern. Furthermore, the air may be unsuitable for landing, due to the weather conditions or the altitude. In these cases landing at night is not considered advisable. The aircraft should land at some other airport or airfield.

6. This type of operation is considered to present a number of potential problems, due to the weather conditions or the altitude. In these cases landing at night is not considered advisable. The aircraft should land at some other airport or airfield.

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5. A Summary of Targets — continue

(3) Yokosuka - This target is an important shipyard industrial area which has so far been untouched. Industrial activities include aircraft manufacture, machine tools, docks, electrical appliances and all port facilities. As the damage to Tokyo has increased, additional industries have been added to Yokosuka. It has the disadvantage of the most important target area being separated by a large body of water and from Tokyo in the heaviest anti-aircraft concentration. For this reason, it has the advantage as an alternative target. Also, Satellite photo evidence of bombing of the city indicates a large area does not seem to have been attacked. [Classified as a B Target]

(4) Kure Arsenal - This is one of the largest arsenals in Japan and is surrounded by urban industrial areas. The arsenal is important for light出来的, anti-aircraft and coastal defense industries. The dimensions of the arsenal are 700 x 2000. The dimensions are such that if the bomb were properly placed full advantage could be taken of the higher pressures immediately underneath the bomb for destroying the core solid structures and at the same time considerable blast damage could be done to core solid structures further away. [Classified as an A Target]

(5) Mitsubishi - This is a port of revolution on the East coast of Japan. Its importance is increasing, as other ports are closed. Machine tool industries are located there and it is a potential center for industrial dispersal. It has oil refineries and storage. [Classified as a B Target]

(6) The possibility of bombing the Emperor's palace was discussed. It was agreed that we should recommend that this action be considered. It was agreed upon this action would only be approved by the President in the event that it was recommended by the Commander-in-Chief, the Secretary of War, and by the Joint Chiefs of Staff. It was agreed to keep in touch with the Joint Chiefs of Staff

6. It was the recommendation of those present at the meeting that the first four choices of targets for our weapon should be the following:

a. Kyoto
b. Hiroshima
c. Tokyo

(4) Yokosuka Arsenal

Mr. Stimson agreed to do the following: (1) brief Colonel Fisher throughout on these matters, (2) request reservations for these targets, (3) find out more about the target area, including exact locations of the industrial areas, (4) obtain further photo information on the targets, i.e. (5) to determine the nature of the construction, the area, height, materials and size of buildings. It was also agreed to keep in touch with the Joint Chiefs of Staff and to keep the sensitive aspects of other possible targets in mind.

[Handwritten note:墒潮巨業]
7. Psychological Factors in Target Selection

A. It was agreed that psychological factors in the target selection were of great importance. The aspects of this were: (1) obtaining the greatest psychological effect against Japan and (2) making the initial use sufficiently spectacular for the importance of the weapon to be internationally recognized when publicly announced it is released.

B. In this respect Tokyo has the advantage of the people being more highly intelligent and hence better able to appreciate the significance of the weapon. Hiroshima has the advantage of being such a size that with possible fallout from near-by mountains that a large fraction of the city may be destroyed. The Emperor’s palace in Tokyo has a greater value than any other target but is of less strategic value.

8. New Against "Military" Objective

A. It was agreed that for the initial use of the weapon any small and strictly military objective should be located in a much larger area subject to blast damage in order to avoid undue risks of the weapon being lost due to bad placing of the bomb.

9. Radiological Effect

A. Dr. Oppenheimer presented a memo he had prepared on the radiological effects of the gadget. This memo will not be repeated in this summary, but is being sent to General Groves as a separate exhibit. The basic recommendations of this memo are: (1) for radiological reasons no aircraft should be closer than 2-1/2 miles to the point of detonation (for blast reasons the distance should be greater); (2) aircraft must avoid the cloud of radio-active materials. If other aircraft are to conduct missions shortly after the detonation a monitoring plane should determine the area to be avoided.

10. Coordinated Air Operations

A. The feasibility of following the raid by an incendiary mission was discussed. This has the great advantage that the enemy’s fire fighting ability will probably be paralyzed by the gadget so that a very serious conflagration should be capable of being started. However, until more is learned about the phenomena associated with a detonation of the gadget, such as the extent to which there will be radio-active clouds, an incendiary mission immediately after the detonation of the gadget should be avoided. A coordinated incendiary raid should be feasible on the following day at which time the fire raid should still be quite effective. By delaying the coordinated raid to the following day, the unpredictability of our already contemplated operations will not be made even more difficult by the reconnaissance of the actual damage directly caused by our device and can be obtained without confusion from the subsequent fire raid, and dangers from radio-active clouds can be avoided.

B. Air cover should be used for the operation as directed by the Field Force Governor.
11. RECOMMENDATION

A. It was agreed by all that very complete rehearsals of the whole operation are essential to its success. It is possible that thirty (30) planes are in the country and perhaps sixty (60) may be shipped in July. These rehearsals should be taken place beginning in July. It was noted that rehearsals should be very complete including the placing of spotter aircraft over the alternative targets, use of fighter cover, etc. Even though the target will not be used as a rehearsal target, operations are required in order that the operations may be carried out successfully if emergency arises for which they are required.

12. OPERATING REQUIREMENTS FOR SAFETY OF AIRCRAFT

A. Dr. Penny reported some very encouraging information he had just received from England in this respect. His previous information was that no one could guarantee the safety of a large aircraft at blast pressure greater than 1/2 lb. per square inch. However, in some recent experiments in England large aircraft have flown over detonations of 2,000,000 tons of TNT and pilots have not objected to going as low as 900 feet. On the basis of a 100,000 tons total equivalent energy release or a 64,000 tons equivalent blast energy 55,000 feet would be a safe altitude, on the basis of these experiments if allowance is made for the concentration of the atmosphere at high altitudes. However, due to the greater duration of the blast in our case, the safe height will probably be somewhat greater.

13. COORDINATION WITH 21ST PROGRAM

A. This matter was included as part of the other discussion and is included in previous paragraphs of this summary.

14. It was agreed that the next meeting of the Target Committee should take place at 9:00 AM EST on 23 May in room 8230 of the Pentagon Building in Washington. Dr. Oppenheimer recommended and others agreed that either Captain Parsons or Dr. Ramsey should attend the meeting.

15. In view of the high classification of the minutes of this meeting, it was agreed that copies should not be sent to these present but that instead one copy should be kept on file in General Groves' office, one copy in Dr. Oppenheimer's office, and one copy in Captain Parsons' office.

Distribution:
Copy 1: Maj Gen L. R. Groves
Copy 2: Capt. Parsons
Copies 3 to 10: Maj W. M. Wuhrman

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