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14 January 1954

SUBJECT: AIRCRAFT POSITIONING MEETING(u)

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1. A meeting was convened at Los Alamos on 21 December 1953 to discuss safe positions of aircraft during detonations of Operation CASTLE. Present at the meeting were:

- | | |
|------------------------|-------------------------|
| Lt. Col. T. J. Andrews | Mr. Joe Kelly |
| Mr. E. E. Bissel, Jr. | Col. D. V. Miller |
| Lt. Col. J. Crosby | Dr. W. E. Ogle |
| Mr. C. B. Cunningham | Lt. Col. D. I. Prickett |
| Dr. H. Hoerlin | Mr. D. Seacord |
| Mr. F. Janek | Dr. William Thaler |
| Maj. D. R. Jones | Mr. H. A. Zwemer |

2. The first order of business was the determination of all aircraft to be airborne at zero times. These aircraft are:

- | | |
|-------|--------------------------|
| B-36 | Effects |
| B-47 | Effects |
| RB-36 | Control and Photographic |
| C-54 | Photographic |
| C-47 | VHF Relay |
| P4Y-2 | Telemetry |
| P2V-5 | Drone Ship Control |
| WB-29 | Early Sampler |
| SA-16 | Air-sea Rescue |
| B-50 | IBDA Techniques |
| F-84 | Samplers |



The positions of these aircraft, as discussed in this paper, are based upon a yield of ten (10) MT.

3. In view of the information available on the P4Y-2, this aircraft was considered first. It is painted all white, with exception of identification markings; it has all metal control surfaces and is equipped with thermal radiation resistant curtains for the crew. A recommendation was made by Mr. Kelly to paint over the identification markings if one wanted to position as close as possible. It was proposed by Dr. Thaler that this aircraft fly for one hour prior to detonations at an altitude of

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1ST REVIEW DATE: 11-1-77
AUTHORITY: OADC EABC CADD
NAME: [Signature]
2ND REVIEW DATE: 11-1-77
AUTHORITY: [Signature]
NAME: [Signature]

5,000 - 10,000 feet and at a radius of thirty-two (32) statute miles from zero. At HQ/sec =

$132.5 \frac{(KT)^{.94}}{D^2 eKD}$ where Q is in BTU/ft² and K=.008/kiloft. The flight pattern at thirty-two (32) statute miles from zero was agreed to by Lt. Col. Crosby as being satisfactory from the TG 7.4 standpoint.

4. At this point, Dr. Ogle stated that he thought the following information should be made available to the positioning committee. It is possible that the CASTLE devices may go better than the probable upper limits that have been published. A reliable authority has stated that the devices may possibly have an upper limit of the following yields:

DELETED

DELETED

DELETED

5. The point was brought out that a crew unprotected from thermal radiation can be the most limiting factor for close positioning. For large yield weapons, eight to nine calories/cm²/sec is about maximum tolerance for human skin. ~~DELETED~~ Heat resistant curtains for the crews were recommended if close positioning was desired.

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6. The P2V of Project 6.4 was considered next. This aircraft is navy blue with fabric control surfaces, a condition that is extremely poor for positioning aircraft close to nuclear detonations. The value of two (2) cal/cm² was considered safe for this aircraft, although this might be too stringent for large yield weapons with a pulse as long as twenty-four (24) seconds. If the project officer desires to be closer than fifty statute miles to the detonation, it will be necessary to have the control surfaces recovered, painted white, and treated for heat resistance. If this is accomplished, a range of thirty-five (35) statute miles would be considered. One would expect about four (4) cal/cm²/sec at thirty-three (33) statute miles from a ten (10) MT device. In any case, thirty (30) statute miles would be the inside limit of this aircraft if it were prepared as the P4Y-2 is.

7. The C-47, to be used as a VHF relay, was positioned at a range of at least one hundred (100) statute miles. Colonel Crosby saw no reason for it to be any closer than this.

8. The C-54 photographic aircraft were positioned at no closer than sixty (60) statute miles at altitudes of 10,000 to 15,000 feet. On IVY they were positioned at fifty (50) statute miles based upon a twenty (20) MT possible yield.

9. The EB-36 control and photographic aircraft was positioned at no closer than sixty-nine (69) statute miles.

10. The WB-29 sampler aircraft was positioned at no closer than one hundred (100) statute miles for the same reason as the C-47.

11. The SA-16 was tentatively positioned at seventy-eighty (70-80) statute miles. Little was known about this aircraft. Mr. Kelly will check on this range for the SA-16.

12. The B-57 was not considered because it will probably not be in the program. Colonel Miller suggested that specifications of the aircraft be taken to the forward area in case a B-57 is phased in late in the operation.

13. The F-84 samplers, at 35,000 feet were positioned at no closer than seventy (70) statute miles.

14. The B-50's from Project 6.1 desire positions at 35,000 feet of one (1) tail aspect at fifteen (15) miles range, two (2) broadside at twenty (20) miles range, and three (3) broadside at twenty-five (25) miles range. These positions will be considered after appropriate calculations have been made by members of the positioning committee. Dr. Ogle expressed concern that the positions seem unduly close, but would withhold any decision on their safe positions until further information is avail-

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able.

15. The project officer for the effects B-36 desires to position it, for a ten (10) MT yield, at a range of 60,000 feet for an altitude of 40,000 feet. It is to be positioned on thermal criteria. They anticipate a rise in aircraft skin temperature of 400°F at this position. Mr. Kelly stated that a rise in temperature of 450°F would probably be alright, but that a rise of 500°F may cause some trouble. Dr. Hoerlin expressed concern about reflection of the fireball from the top of the haze layer. He thought this top to be, normally, between 1,500 and 5,000 feet. Dr. Ogle suggested that Dr. Hoerlin make some calculation on the rise in temperature of the aircraft skin using values of absorptivity, and other factors available from representatives of the committee. He also suggested that a hand held camera be used to photograph zero point for the first few seconds after detonation to determine, roughly, cloud cover or other obscurations.

16. The closest permissible positions of both the B-36 and B-47 were not decided upon. Mr. Janek stated he would send the positioning brochure on those two aircraft to Dr. Ogle as soon as possible so that it can be studied. A determination of these positions will be made in the forward area.

17. After the meeting, Colonel Prickett brought up the following items which will be discussed when the committee meets in the forward area:

(a) An F4-U will act as alternate control aircraft for Project 6.4 if the P2-V aborts. This aircraft must be given a minimum safe position.

(b) Project personnel desire that the B-47 fly over zero point on its pattern to arrive at its position at zero time.

David V. Miller

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