[redacted] DOCUMENT# [redacted] 45

[redacted] INFORMATION

LANL A-91-048

14 March 1953
7:00 p.m.

411435

FILE 8-56

J-16633

NOTES OF A MEETING AT NPG POGO OFFICE, CP (4)

[redacted]

I/1991

To Discuss: CASTLE PLANNING

PRESENT:

LASL -	L. Aamodt	D. Phillips	EG&G - H. Grier
	W. Biggers	H. Plank	B. O'Keefe
	D. Curry	L. Seely	
	A. Embry	N. Smith	
	G. Felt	B. Watt	
	W. Ogle		

I. NEW CASTLE SCHEDULE AND EXPERIMENTAL PLANNING

Table 1 presents the latest shot schedule, showing the proposed sites and dates, a very rough estimate of the yields, and a listing of the LASL experiments which might be considered as commitments, e.g., those considered necessary in order to assess the performance of the models. Thermal measurements will also be made on all shots. We told the DOD we would measure the total thermal flux in order to eliminate a complete program from their list, although this was not originally part of our program (the plans being mainly for very early time data). This is relatively small additional effort for Stewart; his stations will already be there, and transmission measurements are necessary as a photographic requirement.

It will be noted that all except one of the shots are planned for Bikini. Graves has indicated that we can probably, if we wish, plan to fire all the Bikini shots from Enyu rather than from a ship, using a wired system. This means running a wire all the way around the Atoll. Grier thought this would save a considerable amount of money and would be much easier for EG&G.

A. DELETED

Because of a request from the DOD, this shot is planned as a surface (barge) shot over deep water. Their reasons for requesting this type of shot are concerned with measurement of deep underwater pressures, for a comparison with measurements on the deep underwater shot (Wigwam) planned for next year and to investigate a point presently under debate: whether in fact one can inflict appreciably as much damage to submarines or a task force array from a surface shot as from a deep underwater shot. (If this is true, it would apparently change the whole concept of military planning with regard to depth charges, etc.) They have been making some studies of this with HE charges, but contend they cannot trust the scaling relationships.

[redacted] INFORMATION

[redacted]

[redacted]

Att 26

Table 1 - SHOT SCHEDULE AND TENTATIVE EXPERIMENTAL PLAN FOR OPERATION CASTLE

Shot	Model	Yield (MT)	Site	Date	Experiments (Commitments)
1	DELETED	DELETED	DELETED	2/15, Mon.	Yield, time interval, alpha, frame pictures, thermal
2				2/25, Thurs.	Yield, time interval, alpha, frame and streak photography, Ganex, Tenex, Camex, neutrons by gammas, Phonex, Anex, thermal
3	DELETED	DELETED	DELETED	3/8, Mon.	Yield, time interval, alpha, frame pictures, gammas, thermal
4				3/17, Wed.	Yield, time interval, alpha, frame pictures, thermal
5				3/24, Wed.	(Ball of fire photography)
6				4/3, Sat.	(Ball of fire photography)

Notes of Mtg, NPG
14 Mar 53

In a meeting last week at Los Alamos where this subject was discussed in some detail, we told the DOD representatives that while this was operationally more difficult for us, and we did not particularly want to do it, we saw no major objections. The additional cost (because of extra timing lines, photo installations, etc) is estimated to be around one million dollars, and they were informed that if they could furnish this money we would agree to such a shot. It appears they will be able to do this.

DELETED DELETED DELETED

The position chosen by the DOD for this shot is off the southwest corner of Bikini Atoll, in a spot between Bokororyuru and Bokoaetokutoku about one-half to one mile offshore. Here the water is about 1 mile deep. They propose the barge be anchored with two lines (and we would probably insist on adding another, so as to have a triangular array), keeping the tension constant by use of a Sea-Mule engine (an outboard motor affair). According to numbers which they got from the hydrographic office, the wind speed averages 20 knots, constant from the NE from about February through July, and the maximum wave height (from crest to trough) is 2 or 3 ft.

DELETED DELETED DELETED

These are apparently the only requirements LASL places on Zombie, and actually there is only one that is really stringent, the yield; the others one wants probably in decreasing order of priority.

DELETED DELETED DELETED

This will not be decided probably for a couple of months.

DELETED

There was a discussion at LASL between Bradbury, Froman, Mark, Holloway, and Ogle, in which the question was: does one instrument any shot in really great detail, and if so, which one? Froman and Holloway argued initially against a large instrumentation program for any of the tests, maintaining that a yield measurement was sufficient; Mark felt that T Division needed more information than this.

DELETED DELETED DELETED

This means a large program on this test.

At the moment, then, the plans are for yield, time interval between reactions, alpha, both frame and streak pictures (the latter in an attempt to follow the radiation flow). Then in addition one proposes many other things: the measurement program which UCRL will do for us, involving a combination of Ganex, Tenex, the gamma-ray pin camera ("Camex"); there is also a proposal to try to look at the total number of neutrons and at the fission fragments in the way Malik did on Mike shot. Also, there is a proposal to do Phonex (neutron emulsion plates) and Anex (external threshold detectors)--details of these are by no means firm.

DELETED

The conclusion at the moment is that again we measure yield, time interval, alpha, frame pictures, and the rise of the gamma intensity from the thing as a whole.

DELETED DELETED DELETED Actually, all one expects to get is the general of the rise slope. These are the experiments we must do to try to obtain the information T Division has asked for. In addition, we might do whatever else of value we can under the shot conditions given by those limitations.

The plan is presently to put this model on a barge, 2500 yds off Aomoen inside the lagoon. However, if Upshot results indicate that streak photography should be done on the Alarm Clock, the idea is that the barge could be swung around and beached on one of the islands in the Yurochi-to-Aomoen chain, probably Uorikku.

DELETED

DELETED DELETED

DELETED

So far as this group is concerned, we have essentially no responsibility except for ball of fire measurements; UCRL are making their own measurements on all other aspects. Actually, the ball of fire studies are in Berkeley's program rather than ours--they will be done by EG&G, probably contracted through LASL, but not necessarily our responsibility.

II. INSTALLATIONS REQUIRED

A. Frame and Streak Photography (G. Felt)

Frame pictures are planned for Shots 1, 3, and 4; both frame and streak pictures on Shot 2; and possibly streak pictures for Shot 3.

Notes of Mtg, NPG
14 Mar 53

It was Ogle's feeling that we should not try any fast photography on the Zombie, if Mark would buy this, because he was afraid the uncertainty in position of the barge would necessitate such a large field of view that the resulting resolution would be too poor to make the pictures worthwhile.

One would expect to learn from the frame pictures whether or not there were any fantastic asymmetries. Felt pointed out that if there were a serious rupture of the case it would persist for quite a long while, and short focal-length lenses could pick it up. One foot resolution can be obtained with a 150-inch lens, so the results might be fairly good. Felt's feeling was that if we can develop a suitable design for a relatively inexpensive camera station (which he thought quite possible), one should plan on building it, i.e., furnish the designs and choose a spot for it. The actual construction would not start for a few months, in which time we might have more information and be able to cancel or go ahead on it, as indicated. However, if we do not plan for such a station now, we will certainly not get it.

Curry thought the chances of positioning the barge to within 30° or 400 ft were rather slim. However, he thought they would be able to maintain a distance from the shore better than an angle, because the latter would vary with the direction of the wind and current. He would expect it to move approximately on the arc of a circle or an ellipse, perhaps 2, 3, 400 ft toward and away from the reef.

If one put a station down on Chiecrete, variations in angle from the shore should not be so much of a worry. This would be a station to hold, say, two frame cameras and two streak cameras (the latter Felt would include to get the time interval, since they take up only a foot or more room in the station). As for distance, Chiecrete is about 3 nautical miles from the proposed position of the barge, and according to Felt this is acceptable. Grier suggested if the station were moved back it would decrease building costs and the percentage variation due to anchoring problems, and increase the field of view. Atmospheric troubles might be increased, but Felt did not think these would be serious; however, one might gain a little in resolution by being closer. DELETED DELETED DELETED

Here a discussion ensued as to possible means of better positioning the barge. Felt wondered whether a servo mechanism could not be utilized. O'Keefe said that the Navy servo antenna can position to about a degree (a degree or two would be about 250 ft at 2 or 3 miles, which might not be too bad); this is a device which could be pulled out of mothballs without any development. Felt thought if such things already existed, perhaps one could be developed to position it within 1/4 of a degree.

The barge is about 11 ft deep, according to Curry, with about 5 ft of that above the water. The bomb will be about 4 ft above the barge, so one figures on looking, say, 10 ft above water level. Felt would expect to use a periscope system.

DELETED DELETED DELETED

DELETED The Chiserete location was tentatively agreed on. Another possibility is Eninman.

For the other shots, the following positions were picked:

DELETED
- Bokobyaadaa (reef south of)
- Acmoen)
- Acmoen) (same station)

DELETED DELETED DELETED

like to be out in the water, if possible, because it simplifies his recovery problems and allows working in the station sooner after the shot. It was agreed to ask Campbell to look into the relative costs of a land and reef station.

All these stations will have, in addition to the frame cameras, two Bowens to get time intervals.

Campbell will be asked to point the photo station for the Alarm Clock approximately toward Uorikku, since this is the probable site if that test becomes a land shot and streak pictures are necessary.

B. Ball of Fire Photo Stations

For Bikini: 75-ft tower on Bokobyaadaa, Eninman, Bikini Island.
300-ft tower on Enyu, steel boxes on Yurochi.

For Eniwetok: 75-ft tower on Bokon or Muzin.

Coverage of the separate shots would be as follows:

DELETED
- from Eninman, Bokobyaadaa, Enyu
- " " , Yurochi, Enyu
- " " , Bikini, Enyu
- " " , Bikini, Enyu

DELETED
- from Bikini and Enyu
- from Bokon or Muzin, and Parry

The decision on Bokon or Muzin is to be made by Campbell; either site is acceptable to Grier and O'Keefe. Seventy-five-ft towers are mentioned because there are six of them at Eniwetok now. Actually, the requirement is to get up about 50 ft or so above the salt spray, and then one does not care

how much higher it is. The tower on Enyu is a spare shot tower, which will combine the radio and television installation, photo station, and space for Stewart. Photo equipment will not be concentrated here but will be split between the several towers.

DELETED DELETED DELETED

The exact position of the photo sites will be left up to Campbell, the requirement being only that they can see what they are supposed to see, and if possible, that they be as far away from the salt spray as is feasible.

C. Gamma Installations

Stations are needed for Shots 2 and 3. Watt and Ogle agreed that UCRL's station for Shot 2 could be put on Namu essentially in the easiest place to make a 2500-yd straight line for the vacuum pipes. Watt said his gamma station could be anywhere.

No decision was made on location of the other stations. The possibility of using threshold detectors to look at the captive gammas was discussed.

D. Telemetered Alpha

The plan here is to attempt to telemeter this information over a telephone wire, by converting it to an audio frequency. It seems one must have a detecting instrument ~ 500 or 600 yds from the bomb because it cannot be much further, to measure alpha at the point, convert it to an audio frequency and start sending it out, and let it last until the shock hits the detector, which gives about 0.1 sec or so. Exactly how this is converted to an audio frequency is not known. Grier pointed out that they have had enough voltage induced on the lines here to blow up the telephone cable, relatively soon after zero, thought it would be necessary to get the signal out as far as one could, as fast as one could, by some sort of radio system. However, a radio can not be put that close. From past experience, the transmission cuts off and stays off for quite a long time. Smith explained that the idea is to charge up a condenser or something, wait until the electromagnetic signals are over, take a good fraction of a second to get the signal out. He reiterated that we are not sure any of the systems being talked about will work (and one can only telemeter a number, not the boost), but felt that at this stage of the game we should give Campbell an idea of what we might need. This would include a recording station on Enyu.

Ogle suggested that for the barge shots the detector be placed on a buoy with a mast, anchored or tied the proper distance away, a line going out to that distance where one is willing to get on another line or can get on a radio. He sketched a possible "dumbbell" assembly for consideration.

In any event, one should plan on a station on Enyu, and some cable.

E. Thermal

NRL has already asked for stations in the towers originally planned by EG&G for Bikini (on Bikini and Enyu Islands); O'Keefe asked if they would also want to be on the other islands where it is now planned to put up photo-towers. No one was sure. Seely said the closer they can get the better it is for them, up to a point—distance makes more difference to them than it does to the photographic people. The black balls have performed fairly well but do not work in close (they blow up), and one still needs a pretty good measure of air attenuation to interpret their readings.

We have asked Stewart to measure the time interval by looking at the Teller light, which Ogle thought he could do from a tower at quite a distance.

F. DELETED

This seems to be the only other possibility of major construction. It was decided that Phillips should think for awhile about what sort of station he needs and where it should be.

Ogle suggested putting threshold detectors and nuclear emulsion plates at the end of the vacuum pipes. Someone pointed out that Krause's station had no room for this sort of thing on Ivy. However UCRL's station has not yet been built.

G. General

Smith asked whether anyone will do any electromagnetic work to get the time interval. Ogle stated that Watt's group might do this if there appears to be any point in it. Smith thought some provision should be made for room on Enyu to do odd experiments like this. One should also, if possible, try to anticipate what else might possibly be on Enyu, since camp facilities must be planned for this.

Notes Edited by:
WEO:djw:ak

Cpy 1 of 13/A - A. C. Graves
2 of 13/A - R. Campbell
3 of 13/A - Clark, Felt, Seely
4 of 13/A - C. Cowan
5 of 13/A - D Curry
6 of 13/A - H. Grier, EG&G, NPG
7 of 13/A - W. Ogle, A. Embry
8 of 13/A - H. Plank
9 of 13/A - F. Porzel
10 of 13/A - N. Smith, J. Malik
11 of 13/A - R. Spence
12 of 13/A - B. Watt, L. Aamodt
13 of 13/A - LASL Report Library