

PT

September 1961:

Following the Russian test resumption as well as our own underground test resumption, many of the programs have new direction either given or being considered. As for Vele Hotel, "at the request of ARPA, the LASL and Sandia groups have been considering two problems: (1) whether a crash program is feasible to get Vele Hotel type instrumentation up in satallites within less than nine months for the purpose of obtaining information about possible Russian tests in space; after discussions with representatives from AFSSD and Areospace it is thought that a crash program has severe technical limitations in attaining adequate coverage of the regions of space the Russians might employ for testing. Adequate coverage means either large numbers of low-altitude satallites or 2 or 3 high altitude satallites. Neither of these systems appears possible within nine months in the light of the availability and launch requirements of adequate rocket boosters.

As for the Vele Hotel development program, a LASL-Sandia instrumentation package with x-ray detectors was flown aboard Ranger RA-1 launched from the Cape on 23 August. The data recovered was severely degraded due to the wrong trajectory and lack of orientation and TM coverage. Another package launched on a blue scout junior 01 was only a partial success due to a rocket failure on 17 August. Under the title of Explosion containment, scale model tests have continued and the present full scale container has contained a 75 lb. cube of composition B with the next shot to be Phthon HE system.

Note that one of the programs that has gone on in the area of specific weapons development has involved various kinds of environmental tests such as drop tests. Or particular interest is that the Phython has been undergoing such air drop tests at Tonopah. There might be some relationship here to the selection of devices for the Everyready Program.

Also in the area of specific weapons development, certain performance tests of the Rattler and Boa were performed by J-Division in the latter half of August. Under the test planning and evaluation heading there are several pages covering the first LASL underground event, the radio chemical sampling systems, the yield determination problems with underground tests, and some of the ligestics of getting the appropriate equipment tested and delivered to NTS as well as certain device components needed for testing fabricated.

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*note?* The next piece of correspondence is a memorandum from the AFSWC Plans Branch to Gen. McCorkle on the requirements for an open seas nuclear test series in response to his request to prepare such a plan for an early proof test series of untested nuclear weapons. The ground rules are that the series would be of relatively short duration with deployment to Hawaii within 10 days after authorization. The concept of operations is for four war reserve weapons to be dropped from a B-52 aircraft under the control of AFSWC with the detonations to be over the open sea approximately 350 nautical miles southeast of Hilo. Three days of practice missions will precede the first drop which will be done by an Air Borne Task Force consisting of a drop aircraft, airborne diagnostic instrumentation, photo, command and control, weather reconnaissance, and air-sea rescue aircraft. The Task Group Headquarters will be at Hickam (Hicam) with all aircraft staged out of the Hawaiian area. The command and control or AOC aircraft will be an RC-121 and a possibility for the diagnostic aircraft is an instrumented C-130 from AFCRL. Other aircraft discussed are C-130's of the Air Photographic and Charter Service, SC-54's, B-57, B/C/D aircraft. The D type sampler aircraft for high altitude sampling would require modification and could not be ready prior to 3 or 4 months from Go Ahead. The devices listed for testing include three types of 28's and two types of 43's; the various aircraft and their uses are enumerated; logistics and aircraft maintenance requirements are detailed; and various other details of the possible operation are covered in a very preliminary fashion. B2

Some developments of interest took place after the September 61 test  
umption. As documented in other notes, there was an immediate request  
m the Air Force through AFPA to establish a satellite system that could  
spond very fast and provide an early capability for detection of Argus  
fects, among other nuclear detonation effects. A late September 61  
eting of the Joint Technical Group for VELA HOTEL reached certain  
cisions.

NY

It is felt this can be done on  
present time scale for the launches beginning in April of 63 without any  
promise in the present objectives of the VELA HOTEL program. An immediate  
ision is required so that the AEC can begin working on the required additional  
ponents in addition to the on-going program. Note that on the cover sheet of  
s report of the Joint Technical Groups meeting at SSD on 28 September 61, there  
a handwritten note to Bradbury from Darol Froman. It says "the plan cooking to  
a VELA HOTEL package in orbit in time for the big USSR bang got torpedoed at  
h level in DOD, untold."

A 1 September 1961 message from Reeves to Hohner of the Las Vegas AEC office  
authorizes them to proceed with basic construction for Crystal in U12E03A  
in accordance with Livermore criteria. Basic construction is estimated to be  
completed by 15 October.

PD

Extracts from a "Partial Log of September 61 Operation" prepared by R. Newman

These few pages from a J-6 log are in Bob Campbell's possession and he allowed me to read them and take some notes from them. As the notes do, I will go through the items by day beginning with the first of September.

1 September 61: The previous day instructions were received to start towards a test on 14 September followed by a test on 12 October, in 500 foot and 800 foot holes respectively. This day included meetings with Zia and J Division personnel to get the drawings and work underway for the October 12th shot as well as a meeting with Ogle which established the first shot depth at 300 feet to the top of the Alpha can and established the radio chemistry criteria as well as other specific details of the shot. Bradshaw got to work in Area 3 preparing the three-hundred building for occupancy, which perturbed Hertford greatly. He also reported very little cabling and no connectors at the site. Les Hawkins is investigating the funding for this work and Froman has put a \$150,000 amount on Zia work orders. Some canister work got underway. JN

Here is a secret message dated 1 September 61 from Betts to the Laboratories and Operations Offices which give the known information on the Russian resumption of testing as follows: " An explosion has been detected as having occurred in the atmosphere at 0700 Z (3:00 A.M.E.D.T.), 1 September 61. The best location is in the vicinity of the semipalatinsk proving grounds at 50° north, 78° east. Signals have been reported by three acoustic stations. No seismic and no electromagnetic signals have been reported at this time(1430 hours E.D.T.). JJ

Nuclear confirmation cannot be expected prior to 4 September 61." Preliminary reports on virtually all of the Soviet tests are contained in various messages throughout this folder.

A 1 September message from Hohner of ALO to Mercury, to Carl Tayler of Recco and Frank Hines of II&N directs them to proceed immediately without causing too much publicity, for planning, scheduling and procurement for support construction for readying the ~~three~~ hole for joint user occupancy by 10 September by LASL. Apparently, the work to be done is to backfill this 500 foot hole to the 250 foot level and then to finish the hole for device insertion.

FM

B

SEPTEMBER - 61

- 1 September First Russian shot since Nov. '58 (intermediate force over Soviet Central Asia). m
- 1 - 4 September Twenty-four non-aligned countries meeting for conference in Belgrade, Yugoslavia hear Soviet announcement of test resumption. UAR President Gamal Abdel Nasser denounces USSR decision to resume tests and proposes immediate summit meeting. m
- 2 September Speaking at Belgrade Conference, Indian Prime Minister Nehru says the "danger of war has been enhanced by the decision of the Soviet Government to resume nuclear tests. There is no choice left between negotiations or war. And if war comes all is lost." m

2 September: More discussions on design and equipment procurement with Zia attempt to ship the appropriate coax links with connectors installed on the 5th of September. Down-hole cables are still a problem as is the amount of room to be assigned to the various experiments and experimenters. Livermore (Pacigalupi) has promised Newman the use ~~of~~ of their crane which was requested the day before. The notes here include a detailed discussion of the configuration for the first shot with the various diagnostics and cabling. Rea Blossom is to be the J6 representative at the NTS, leaving on the 4th for NTS with Newman to go out on about the 10th. Blossom attended a meeting in Albuquerque on the 1st where it was said that someone higher-up desires to do the entire "old" schedule as soon as possible; the 6000 foot core hole was authorized; all work at the NTS however is in abeyance until announcements are made. A general day by day schedule shows the 12th as the day for the cannister to start down-hole.

JH

There are no entries on Sunday and Monday, Labor Day, has very few entries inventory being done at the NTS.

JN

3 September

President Kennedy and Prime Minister Macmillan address plea to Chairman Khrushchev asking that the "three governments agree, effective immediately, not to conduct nuclear tests which take place in the atmosphere and produce radioactive fallout." Message says US-UK aim is to protect world from fallout dangers and reduce international tension.

EM

4 September

USSR sets off second explosion in new test series.

EM

Belgrade Conference approves text of communique to President Kennedy and Chairman Khrushchev asking two leaders to meet for talks on Berlin, disarmament and other key issues. Prime Minister Nehru and President Nkrumah deliver message to Chairman Khrushchev; President Keita of Mali and President Sukarno of Indonesia, to President Kennedy.

4 September

Joint US/UK statement of 3 Sept. proposing immediate test cessation by USSR was read at the Geneva negotiations and Tsarapkin answered by reading the Soviets' 30 Aug. statement which he felt was an answer to the US/UK proposal. He stressed general and complete disarmament as the Soviets' answer to the question of nuclear tests.

EM

5 September

President Kennedy orders resumption of nuclear weapons tests by US, specifying that tests should take place in laboratories and underground with no fallout.

EM

Kennedy announced the US would resume testing, although only underground. He also stated the proposal "to end all fallout tests remains open until September 9."

EM

5 September TWX from Reeves to Hohner requests them to coordinate the LRL and LASL requirements for cabling and prepare specs and initiate the negotiated purchase immediately. There seems to be no indication that the July and August discussions and inventories and lists of cabling requirements were ever met with any direction to do any procurement.

AM

It is clear from a letter dated 5 September from Chairman Seaborg to Mr. McGeorge Bundy that the alternative approaches to resuming testing addressed and discussed by the AEC General Manager came out of Seaborg's discussions with the President and Secretary McNamara a few days previous. Clearly, McNamara was asking for a quick response to match the Russians and he had said specifically what could the AEC do to provide 3 shots on a "two-weeks, four-weeks, six-weeks schedule". Secondly, because these shots might not be noted other than by the fact that we would announce them, it was further requested that a schedule for a high enough yield shot that would clearly be felt and noted off-site and by foreign observers be detailed also. In his response to Bundy, Seaborg reiterates the disadvantages of the alternative programs for three quick shots and for the soonest possible high yield shot and even adds a couple other disadvantages. One other disadvantage that he notes is "the Soviets have tried hard to picture us to the world as having made continuous preparations for testing and to be ready to start at the very first opportunity. They surely would take advantage of any announcement by us of an almost immediate test detonation to further <sup>up</sup> ~~the~~ line." In brief, Seaborg concludes by recommending to Bundy that if a test program is to be undertaken, it be the short range program that has been set forth and discussed and prepared for since July. It is noted further that a decision must be made on this very day, September 5th, to meet a first detonation schedule of September 14th.

A

5 September: as expected, there was a great deal of work this day with several railers for the J Technical Groups being prepared for shipment to the NTS within a day or two. Charles Browne has okayed the configuration for the sampling set up for the first shot. Ogle has informed J-6 that Sandia will do some sort of seismic measurements and wants the first shot on the 14th with the 625 foot hole shot to done as soon as possible, but about 1 October. (This was later done at the end of October) Ogle also directed that the 6000 foot hole be started as soon as possible (not sure what this means). Several items between Newman and Blossom at the NTS on this day, in particular Blossom got Reeco on extended time, since "the AEC ain't got the work out here." Also Blossom was directed to go ahead on hole U3AE at 800 feet (later used

JN

Here is a 6 September 1961 message from Richard Elliott of ALOO to F. Hohner ,  
Manager of the Las Vegas AEC Office on the subject of News Media and LW  
Visitors at the NTS. The thrust of the direction is mainly to note that NTS is  
now closed to access by News Media and other unofficial visitors, in spite of  
previously planned visits. The official statement made by ALOO and authorized  
to be made is: "We are now doing those things necessary to implement the  
President's decision. As is customary during such periods, Nevada Test  
Site is closed to access by unofficial individuals." Also noted in the message,  
is "CBS-TV and Telenews (with ABC-TV) indicated they might have crews in  
Las Vegas in hopes of them being permitted interviews. Meanwhile they will  
seek man-on-street reactions."

6 September Memo for the File by Bob Miller discusses the DOD briefing  
weapons held at the ALO offices by Col. Kiley of Field Command, DASA  
5 September. Among other things, Kiley advised that they were lining  
two L20 and one C47 aircraft for support at NTS and that Col Kodis  
uld depart for Washington on 6 September to contact ARPA concerning  
o items. One, to get Hardhat approved for a 5 kiloton nuclear detonation  
l two, to discuss the impact on Vela Uniform of the projected expenditure  
NTS tunnels for weapons testing and to check out the ARPA plans for  
oundhog, Shoal, and Dribble in light of the probable resumption of  
apons test.

AM

DMA and in particular a Lt. Col. McMillan are now on about the 6th of  
~~September~~ actively investigating the rights and facilities and supplies  
that AEC has at EPG.

A 7 September TWX from Betts to the Labs asks them to answer specific questions  
concerning the advantages and disadvantages of testing in the atmosphere and  
requests the replies by 11 September so that a joint AEC/DoD position can be  
prepared for submission to the President in the near future.

A

First entry in this folder is a 7 Sept. 61 message from Betts to Livermore and LASL which asks for specific detailed estimates for a possible 100 megaton weapon and asks that these estimates be into DMA by 12 Sept. NU

The LASL reply from Carson Mark on 11 Sept. gave one possibility for building such a device, The development of such a device from the nuclear design viewpoint would not seem to be more difficult in principle than the TX-53."

6 September: A great deal more details of the many sides of the work going on with discussions with Ogle of the backfill for the first shot. This is to be clean silt for a short distance above the can with sand the ~~remain~~ remainder of the way to within five feet of the ground and a Calseal concrete cap. Newman and Graves discussed code names for the LASL shots with Newman suggesting New Mexico native animals and Graves suggesting one syllable words. Cox informed Newman of the possibility of hydrodynamic yield measurements. Ogle requested that USGS find water tables below one thousand feet up to six thousand feet in 1000 foot intervals. JN

7 September: Plenty going on. Blossom requested 10,000 feet of certain type of cable immediately to replace that cut by a blade this morning. At Ogle's request, working with H & N on the question of satellite holes up to twelve inch diameter to place gauges for time of arrival, pressure, etc. measurements for such things as hydrodynamic yield. Newman says Blossom is "shook about Campbell's apparant order ot to raid 400 for Reeco support. Instructed him to use what was necessary, all if equired, but no more." Newman saw a TWX that Ogle has received about atmospheric esting. Lots of activity at NTS and LASL not only for first shot but also for first SETSE, later MINK. JN

61  
A 7 Sept. message from Betzel to Betts gives a list of devices and events planned for a short-term underground NTS series. The first 2 in this order are Chena and Antler. LF

1961

B

7 September Betts to labs: asked for information on need, etc. of atmospheric testing for early submission to President.

b

3  
B

7 September Agnew discussed NTS schedule at WVG. Said 4 drill rigs working at maximum capacity allowed planning about one test every three weeks and that, regardless of schedules, shots would be done as holes became available. Alpha and radiochem. measurements currently planned on all tests. Cowan reported early, meager Russian test radiochem. results.

v

7 September Bradbury to Betts: contains LASL tentative plan for testing --  
-- 14 Sept. date for 1st underground shot  
-- stresses consideration of atmospheric and hi-altitude tests and advantages of same  
-- all-out digging, testing rate --- non-conservative containment, etc. ground rules

b  
P

7 September LRL getting ready for 15 Sept. shot

C

- Meeting between ARPA, DASA, and FC/DASA on 7 September 1961 addressed inclusion of V U experiments in Nougat tests (DASA message #603177 on that date addressed this).

FL

P

1961

part  
Oct.  
1961

This folder contains a myriad of correspondence discussing getting ready for testing in Nevada and the ongoing operations of the Nougat series. A very interesting TWX sent from Bradbury to Betts on 8 Sept. addresses in a great deal of detail the philosophy that LASL sees to cover the future of testing now that we're about to get started. He discusses the possibilities and limits of underground testing and the ramifications of testing in the atmosphere either in Nevada or in the Pacific in various places and the response times thereof. He discusses the possibility of systems tests as the Atlas, the Minuteman, Nike Zeus, etc. and the desirability possibly of doing these at Johnston rather than from the actual areas where they can presently be launched. He notes the need for high altitude effects tests and vulnerability studies and the difficulty of doing these underground. As a general statement, let me quote the following: "LASL has to ignore all the various aspects of propaganda factors one way or another. All the experts are in Washington. In general we would recommend the following: Let us try out underground testing in Nevada as fast as we can and see what we can do and what troubles we do or do not get into. We may end up saying "Fine, fine" or we may come running to Washington after a few months with the cry that we aren't getting anywhere. I think we have to give it a good try fast. By the first of the year, we should have a pretty good idea of what the virtues and difficulties are. We will also have a better idea of where we are headed in the international situation. No big warheads really need testing today. In 1962 we may want to crank up balloons in Nevada for small things because we are going too slowly or getting too little data or we may not. For big things we may want to sweat it out for a while longer and enjoy our propaganda advantage or we may want later to debate the possibilities....." This is the first piece of correspondence that I know of that goes into a great deal of detail on the possibilities of atmospheric testing, the locations, the schedules, etc.

8 September: Present schedule shows the following for delivery of cans to NTS and possible use dates as follows: shot 1, delivery done for use 9/14; shot 2 delivery 9/22 for use 10/1; shot 3 , delivery 10/5 for use 10/15; and a couple more shots within November. Lots of search for and ordering of cabling, connectors, Crosby clamps, etc. going on. Blossom reported that drill rigs would be in the night of the 12th. A dry run is planned for the evening of the 8th by EG & G. Ogle said that DMA asked LASL to consider U12E03B for a 40 KT shot in late December, and after meeting with Westervelt and Hoerlin, replied to Betts that "could do but cover is 300 feet insufficient on 450W to the one-third basis." This particular yield is being planned by LASL for a 2000 foot hole on 14 January 62. Drawings have now been requested for two additional shots, a 100 ton shot and an added 10 KT shot Blossom and Newman discussed the 6000 foot core hole, to be positioned one-half mile west of 3-300. Blossom wanted to know if HIVAC would be okay for recovery drilling and Newman replied, "Yes, if debris can be contained and personnel protected." Blossom also inquired as to how many rigs would be needed for post-shot drilling. Newman checked with ~~Zinkins~~ Cowan on this day to see if the ~~ORCHID~~ hardware could be used for U12 E03B if necessary and possible, and Cowan said fine if this was to be done earlier than ORCHID. Discussions with Cox disclosed that, following a meeting with Bradbury, the first shot date is now 15 September.

JN

An 8 September TWX from the Chief of DASA to CRL, AFSWC, etc., addresses the high priority that must be given to certain types of effects tests which might include a high yield, high altitude ionospheric and exospheric effects test sometime in the near future and details the need for information on radio frequencies, F layer absorption and blackout, EMP, etc., and directs OAR and Systems Command to study these programs immediately and to implement the proposed programs as soon as possible with the promise from DASA that the funds will be available.

BZ

9 Sept. TWX from Betts to labs, operations offices, ARPA, DASA, and Air Force. Subject is Vela planning in light of weapons testing. Plans to continue Vela Uniform efforts as resources are available and in conjunction with testing program (without undue interference). The TWX contains details on specific Vela Uniform shots.

HO

9 September

Krushchev's reply to the West proposal said a ban on atmospheric tests only would permit the West to improve their weapons by underground testing relative to the Soviets since the U.S. had been preparing for this. Khrushchev called it a "dishonest deal" and said Russia would not agree.

NI

B

He again brought up France, saying it was "clear that the results of nuclear tests, held by any NATO power, go into the common imperialist NATO pool." Again, he stressed a test ban could come only with disarmament. Also, the USSR asked for conclusion of a German peace treaty "so as to arrest in good time the sliding of states into the inferno of a rocket nuclear war."

NI

9 September

Tsarapkin read Khrushchev's test ban rejection at Geneva and Charles C. Stelle, the acting U.S. representative, spoke on the Soviets' test resumption and supposed justification. Among other things, Stelle noted that the Soviets had threatened on 15 May to resume tests if France continued and France had since done no testing. He gave his view that the Soviets' decision to resume explained why they had been so obstructionist in the 1961 negotiations.

NI

1

9 September: Not too many notes but this probably reflects the activity at LASL rather than the high level of activity at NTS. EG & G had a "real good" dry run last night and the LRL drill rig is in place, with other drill rigs coming in. Design of several other holes is in progress (AG, AH, and AI).

JN

No notes for work on Sunday.

JN

~~11 September: Plans going on, looking at...~~

No similar notes after this date, probably indicating that Newman went to NTS.

Here is a lengthy message from Bradbury to Betts sent on 9 September 61, which is also documented under 8 September in the notes marked P. I wish to note salient points that Bradbury makes at this point in time as to his feeling for underground testing versus various atmospheric test concepts, which I did not get into detail on in the notes in . Bradbury says that LASL is generally of the opinion that it will prove somewhere between impractical and impossible to test much beyond 100KT underground, due to such things as adequate containment, ground water problems, and seismic effects. LASL also isn't convinced at this point in time that good yield measurements can be made on underground shots which have an appreciable TN contribution. In spite of this, "if the yield measurement problem can be surmounted, it is probable that underground testing up to 100 KT or so can do everything except air effects experiments that can be done in air." In addition to the yield flexibility offered by atmospheric testing, as well as the capability to make better measurements, the time factor seems to favor atmospheric testing where things could certainly be done more rapidly. He estimates the time it would take to support air drops over the open ocean with minimal diagnostics and feels that it would take less than four to six months to prepare the necessary Naval and Air support. Bradbury feels that Eniwetok could be cranked up for support such as in previous operations in about four to six months if the trust territory question would be resolved in its favor. If Eniwetok is not available, there is always Johnston Island for air drops or for deep anchored barge shots and he would guess that six months would be required to attain readiness there. He further discusses the fall-out problems, the possible desirability of number of system tests, and the possibility and mechanics of high altitude tests.

NS

A memo from a Major Rosen from the DMA Test Office to General Betts on 9 September 1961 addresses a DoD study entitled "Case for Nuclear Testing" and doesn't really seem to think much of the study as far as being at all comprehensive or really saying very much. Among other things the study notes the DoD's need for effects tests but doesn't make a very strong case for any justification for tests other than underground tests. Rosen goes on in his memo to list and discuss crucial problems in deciding whether testing should be done underground or in the atmosphere if there is a choice. Among other problems he discusses the time factor where atmospheric testing can probably do the same number of shots much more quickly than can underground testing, diagnostics where it is not known for certain if all the needed diagnostics can in fact be acquired by underground tests, costs where because of the time factor involved the lengthy underground series will cost a good deal more maybe a factor of several times more than atmospheric tests programs, and finally the yield limit on underground shots which would not exist for the same reasons for atmospheric or outer space shots. A

A 9 September TWX from Betts to the Labs discusses the inputs from the DoD after seeing the AEC's proposed programs and lists in particular the effects test that the DoD proposes and a priority in which they would like to perform them. Further, the DoD lists in their shot list 4 devices which they feel require proof or developmental tests which the AEC hadn't included in any of their lists and Betts asked for comments on these. The entire DoD list contains 44 tests to be done in a two-year test period. A

In addition to the Foster and Bradbury replies requested by Betts on the matter of atmospheric versus underground testing Hertford of ALO replies to Betts and concludes that given certain assumptions that he makes one or two atmospheric tests could be quickly staged at the NTS and accomplished without too much consideration for public opinion because of the attitude of the people in that area among other things.

Both Foster and Bradbury by TWX's in the 10 days following the 9th of September request from Betts for information on the DoD shot list replied to Betts with their comments on the DoD's shots not included in previous A

AEC proof and development requests.

Here is the 9 September 61 operations order for NOUGAT written by Jim Reeves of ALOO. I believe we have it in other notes and it is #OTO-OpO-11-61. Among other things, it lists the organizational structure for conducting these underground tests showing Reeves as the Test Manager, Kiley as his Military Deputy, Graves as Scientific Advisor, Batzel as Alternate Scientific Advisor, and Nielsen, Ogle, and Kodis as the three test group directors. M

9 September

On the initiative of the U.S. and U.K., the Geneva talks recessed indefinitely to await the results of E

9 September LRL reply to Betts' 7 Sept. message said various types of above gd. effects tests needed. c

9 September DOD tests series aired (not coordinated with AEC). c

- Betts to Hertford TWX (SRD) 9 September 1961: discusses how Vela Uniform goals should be addressed with 1st priority now going to weapons testing. (copy went to Bradbury) msg. #S-091, dtg 091635Z September 1961. FL

BRIEFLY -

- Shoal and Porpoise inactive.
- Linen cancelled.
- Orchid goals can be fulfilled from Chickadee test.
- Stingray requests can be fulfilled by
- Lollipop requests can be fulfilled by Hardhat (if approved).
- Crystal and Muslin requests partly addressed using 45, Arrow, Lance I, and Lance II.
- Looking at some VU use of Area 3 since they would give info on new medium.
- Gnome is being planned to include Vela participation.

September - 61

USSR rejects US-UK plea of 3 September to ban atmospheric tests and asks for conclusion of a German peace treaty "so as to arrest in good time the sliding of states into the inferno of a rocket nuclear war."

Thirty-four month-old Geneva test ban conference goes into "indefinite recess."

Here is a message from Carson Mark to Betts on 11 Sept. in response to a 7 Sept. NS  
request from Betts. Mark sets out the LASL estimates of a large device to provide a yield about 100 megatons with a few estimated details of its size, method of operation, delivery, etc.

in response to a query from Betts, Foster answers on 11 September 1961 as NB  
to his Laboratory's estimates as to what it would take to develop very high yield weapons. This is probably already noted in the "100 megaton" folder but I will mention it briefly here anyway. The simplest path apparently seems to be a scaled-up version of the TX-41 which Livermore feels could probably be made on a 3 to 4 year time scale. On a somewhat longer

possible to obtain

11 September

ALO memo notes presid. approval with LRL first on  
15 Sept.

*not*  
An 11 Sept. memorandum from ALO notes the delegation of authority by  
the President of the United States for Operation Nougat and places an  
LRL device first on the list for 15 Sept. date.

1961 P

P

11 Sept. 61 Memo for OTO files by Bob Miller on "Weapons Readiness Meetings,  
31 - Sept 2." He notes that labs and ALOO met on 31 Aug. to evaluate and  
readiness program based on 11 & 17 Aug. memoranda from DMA (copies in our  
files). That evening, DMA requested reaction to accelerated three-shot program:  
Arrow, and Tsetse. Labs worked out scope and dates for this and "short-term"  
program and presented it to Betts and Luedecke 2 Sept. for a crash program  
beginning 5 Sept. (preparations). Additional request was made from Washington to  
consider 30 kt device in E07; estimates were prepared but concern was voiced that  
a shot done hastily could render the entire E tunnel complex useless for  
a time due to blast and radiation.

HP

Memo from Betts to Hertford on 12 Sept. asks the labs to consider, at the  
Force request and with AFSWC assistance, possible EMP phenomenology study  
tests.

HP

12 September

Pres. approval for 3 event program.

C

Some Sept. 61 correspondence indicates that on 12 Sept., Harold Brown, DDR&E  
sent out a memo on the subject of "Measurements associated with Soviet tests

JS

In line with this direction, DASA is providing funds to various agencies  
to address different types of measurements and in this particular 20 Sept. 61 message  
to the Chief of Naval Research is authorizing funds addressing ionization caused by  
the high altitude detonation of nuclear weapons. About the same time they also  
funded similar operations with the Air Force CRL and with the Army, as well as  
funding measurements in other areas such as blast effects through various agencies.

A message from L. Gise of ALOO to Bradbury, Foster, Schwartz, and  
on 12 Sept 61 addresses a new twist to the VELA HOTEL program.

NV

ARPA, is implementing on a very urgent basis a program to establish  
its capability for detection of Argus effects. SSD has requested the  
recommend appropriate detectors and logic for such a system which  
be in a three-hundred mile earth orbit, using the BLUE SCOUT as the  
vehicle. The estimates of payload size are 125 lbs. in a polar orbit,  
is followed by 200 lbs. On 18 September, there is to be a meeting in the  
room in Major Poulson's office (ARPA), at which Laboratory representatives  
requested to be present and present their thinking and recommendations on  
ion and logic systems, with probable weight and volume estimates.  
or, there suggestions as to optimum orbits for Argus effects detection  
number of satellites is requested. The priority given to the program  
dictated to give it a target date of three to four months to launch.

The next meeting, and first meeting since 1959, of the NTS Planning Board,  
was 13 September 61 and is documented in other notes. Note that in these extensive  
minutes of the second meeting, on 27-28 September, the Planning Board noted in  
Annex A that the missile program proposed by the AEC should establish "priority for  
THOR missiles and tactical ground support equipment." The only high altitude shot  
shown in the list is the 50 test of the NIKKI-ZEUS warhead, carried by the THOR  
to 125-150 kilometers from Johnstone Island.

A 13 September 61 report from NVOO covers the check list for the ANTLER event.  
Interest is a listing of the key personnel which include: Test Manager-Reeves,  
ernate Test Manager-Milton Rex, Military Deputy-Kiley, Deputy Test Manager-William  
aire, Scientific Advisor-Graves, Test Group Director(Livermore)-Dale Nielson,  
ernate Test Group Director (Livermore)-

LP

Box 289

Here are the minutes from the NTS Planning Board Meetings beginning with the 13 Sept. 61 meeting, on which I have taken notes elsewhere. Here is a TWX covering the 27-28 Sept. meeting from Reeves to the NTS contractors which notes certain guidance to be used by the contractors in preparing costs estimates. The Dolomite event is to be shifted to the mid-term program. The I, J, and K tunnels in Area 12 are to be prepared for, yields

and readiness dates of Dec. 15 for K, Jan. 15, 62 for J, and Mar. 62 for I.

Here is record of a phone call from E. Bowen of H&N to Sherman Sullivan in Los Angeles on 13 Sept. 61 wherein H&N proposed to make a study of what it would take to reactivate Elmer and Sullivan told him that while he felt such a study would be highly desirable, political considerations might preclude doing this. Sullivan spoke with Rex of ALO and got agreement that the presence of H&N personnel doing a physical survey might trigger unwanted speculation and Rex would discuss this with Reeves. Finally authorized was a small sum of money for a preliminary study to be done in Los Angeles on this subject and to be accomplished "discreetly." Sullivan was head of the Los Angeles Branch office of the AEC.

A copy of TWX dated 13 Sept. from Schwartz to Betts on labs testing capabilities  
tes;

1. Balloon (tethered) tests at EPG (aerodynamic) and at NTS (Plumbbob type). Crash EPG program could do 1000 lb. payload at 5000 ft. in approximately 90 days. Equipment stockpiled at NTS could lift 2000 lb. to 1500 ft. in approximately 3 weeks. TWX notes that LASL developed Pinex balloon capability during moratorium.
2. Out of the atmosphere (50-1000 kilometers): Thor with companion rockets and groundbased instrumentation from J.I. in 6-8 months. With on-board instruments and dicaps, 12-18 months. Lighter payloads could be done by Polaris from Norton Sound or sub in shorter time. He notes the possibility of RV effects tests with rockets.
3. Outerspace testing: No sooner than 18-24 months.

AFSWC History Office

A letter from Gen. McCorkle to a Maj. Gen. Whisenand of AFSC Plans notes that on 13 September, Whisenand requested AFSWC to prepare a study on large scale nuclear weapons and this seems to be in line with the thinking and discussions of such large scale weapons that the AEC worked out starting about this time over the next month or two. Further McCorkle goes into great detail on the personnel and capability problems within AFSWC due to the transfer of various subordinate units who had supported testing in the past and also the deactivation of the 4950th.

A 13 September letter from Maj. Gen. Whisenand of Systems Command Headquarters to Gen. McCorkle notes current discussions between the two organizations on the Soviets testing and their intents to test very high yield weapons. Systems Command Headquarters asks AFSWC to prepare a study in accordance with an attached outline which generally will be a study of large yield weapons and will examine potential Air Force requirements for weapons in the 60 to 100 megaton range and will cover the weapons effects, delivery systems, test requirements, etc. BZ

There is a lot of correspondence in this period between Command Headquarters and Headquarters Air Force and the lower level units such as AFSWC, Ballistic Systems Division, OAR, etc., addressing various meetings and studies to put together the Air Force requirements for testing as well as the Air Force capabilities for testing in various iterations. Of particular interest is the very early (as early as 8 September) stress from Ballistic Systems Division to higher Headquarters that the nations ballistic missiles be tested in the Test Series whatever it might be. Specifically, for the MINUTEMAN, TITAN, and ATLAS systems, warhead proof tests, weapons effects tests, and full-scale systems tests are all stressed for possible testing in the future. Specific tests to look at the problems of ground shock and structural dynamics, and EMP shielding are also urged by BSD.

**Minutes of NTS Planning Board Meetings Beginning with  
the 13 September 1961 Meeting**

The following notes cover the recommendations from Mr. Reeves of NVOO and the pertinent notes from each of the Planning Board meetings by meeting date:

13 September 1961 - In addition to the information and conclusions and recommendations coming out of the meeting Reeves provides Gen. Betts with the following information: (1) that preliminary planning in connection with reopening the EPG has been initiated and that a 21 September meeting between LRL, LASL, Sandia, Holmes & Narver and Reeve's office will be held in Los Angeles to develop an integrated approach to the Eniwetok requirements such as balloons, barges, towers, cabling, etc. Further, that a preliminary report should be available in about 3 to 4 weeks after a small survey party from H & N visits the Eniwetok facilities which is hoped to be immediately. (2) that ALO is presently working on the budget for the upcoming NTS program and that cost estimates are being prepared and should be submitted to DMA and appropriate authorities prior to 20 October 1961. Following are the specific notes on the Planning Board discussion by item discussed: (1) a review of DMA, LASL, LRL proposed events; it was concluded that it was unrealistic to attempt to firm up a schedule for any period longer than 4 months and that such a schedule should be considered very tentative. Comments were made on the short-term schedule which would cover the operational period for Nougat through February 29, 1962 only. It was recommended that an additional operational period and title be established for the period beginning 1 March 1962. The events, sites, general readiness period and details of each shot were tabulated for the period beginning March '62 and were stated to be very tentative. It was recommended that Presidential approval for special material expenditure for Nougat should be in gross figures rather than being related to specific events. The LASL schedule was stated to be based upon a concept of two events per month following the first four events in Nougat. Beyond that four event period device readiness would probably influence the schedule as well as site readiness. It is further stated that an NTS mining and drilling capability must be achieved to meet the present planned schedule and that after attainment it should be maintained regardless of delay or interruption in test schedules. As for events and experiments in addition to the short term Nougat schedule the following were noted: an experiment in Dolomite is vital to engineering the high yield sites in the U12e and g complexes and such an experiment should be done as soon as practicable and should be included in the mid-range program; two Plowshare events per year could be accommodated in side drifts of the U12b-e or g tunnels as a rather small addition to the schedules and the Plowshare Wagon event would be accommodated in Area 18. The philosophy for DoD experiments with the exception of Hard Hat and Marshmellow was that they would not be considered in an integrated fashion by the board but would be approved at the Washington level and integrated into the schedules at the field level. Discussion item (2) was to consider the DoD experiments; the board gave attention to the Marshmellow and Hard Hat

BA

experiments which were presently in detailed planning. Discussion item (3) was to consider and recommend emplacement of LASL's XW50X1: the question had to do with whether this device should be fired in a deep hole or in U12e03b. The tunnel facility it was determined should be assigned to LRL for a low yield device and deep hole exploration should be advanced to find out whether it would be feasible to fire the XW50 in such a deep hole. Further, the question of whether it would be necessary to fire this device in the tunnel area such as E07 or 06 should be pursued and should it be determined that such a tunnel would be required then the lab directors and Gen. Betts would have to determine the program priority of the 50X1 vs. the 56X1 or

LRL devices. Discussion item (4) concerned integrating the Vela Uniform program: the board concluded that one particular tunnel should be established as a stockpile site for a low yield weapon's test and that the Vela Uniform program should be integrated on a noninterference basis with the assumption that maximum measurements would be obtained. Discussion item (5) was to consider the disposition of 8 million pounds of HE in Area 2: the Test Operations Office under Reeves would have the responsibility for the determination of such disposition and DoD would utilize up to 1-1/2 million pounds in their Groundhog program with further action to be planned through field command and other possible customers to be contacted. The high explosive as presently stored is not an immediate safety problem. Discussion item (6) was to consider the immediate and longer range list of support facilities required at the NTS: various needs for support facilities were now recognized as existing or soon to exist based on the extended nature of the test program and Reeves' office would evaluate the support requirements and submit lists to the appropriate authorities as soon as practicable for facilities such as housing, administrative laboratory space and recreational facilities. Further it was noted that the labor force should be augmented as soon as possible to establish a 40-hour work week for crafts. Further a six or seven day work week would be required for specified areas only and only then on an as required basis to meet schedules. Discussion item (7) was to consider the possible midterm program: among other things the board concluded that the following actions should be taken: (a) immediate action for construction of the G tunnel to support tests beginning in late spring or early summer 1962, (b) continuation of deep hole exploration for proposed LASL high yield events, including immediate engineering geology assistance, (c) expansion of the long range hydrological program including possibly 8 deep holes as part of the ground water studies and to provide engineering data for high yield test facilities, (d) immediate initiation of studies and activities to address the feasibility citing costs and schedules for a Christmas Tree facility. Both LRL and LASL expressed a desire to share such a facility should it be concluded as feasible. And (e) the following support by the NTS organization in the areas of mining and drilling: mining to include extension of the U12b complex, drills and shafts in the U12e complex, a new U12g complex, a Dolomite tunnel or shaft and postshot exploration in the Hard Hat tunnel; drilling to include Area 3 exploration and emplacement, LASL deep hole exploration, postshot exploration of Hard Hat, exploration of the Christmas Tree concept, deep holes for the hydrological program, and many small diagnostic holes both horizontal and vertical. Discussion item (8) considered the possible long term program and the facilities required for this: the board concluded (a) that there is a need both valid and urgent for an underground facility for large yield shots, (b) that expanded support facilities for both technical and support personnel are necessary, and (c)

BF

that a continuing program of 3 or more shots per month would be assumed to continue indefinitely. Discussion item (9) addressed the impact if any of the Plowshare Gnome shot: the board concluded that Gnome would have no major technical impact on weapons tests other than the availability of technical personnel which would be a scheduling problem. The attachments to the minutes just discussed include a recommended schedule of events for Nougat which includes 15 designated events through February 11, 1962. Of these, 5 are LRL, 9 are LASL, and 1 is a DoD shot. Further, a Dolomite LRL shot and 2 spares are included in the list for a total of 18 shots in the Nougat program. The midterm program also included as an attachment contains 15 designated shots divided about equally between LRL and LASL with one DoD shot and extended between March and September of 1962. Another attachment contains the list of support facilities required at the NTS with an estimated cost for each and the grand total is \$6.1 million dollars with maybe 20% of this recommended as needed immediately.

The most useful document in here is the NTS Planning Board Worksheet which was used by the board members at the 13 September 1961 board meeting which considered the beginnings of the test resumption and what became the Nougat series in 1961 and 1962. This worksheet covered the so-called "short term program" and made the following basic assumptions: (1) that the cover would be determined by the formula  $475 \times W^{1/3}$ , (2) that LASL diagnostics would include  $\alpha$  and yield for both devices and rad chem for and measurements for devices, (3) that the DMA fiscal program must remain within \$30 million dollars through February 1962 which was defined as the end of the Nougat series, (4) the delivery of cable would be accomplished as presently planned with additional cable perhaps being required, (5) no major difficulties are encountered such as exploration of Area 5E7 or labor or similar type of unforeseen difficulties, (6) that the Plowshare or Nougat projects could participate only on a noninterference basis, (7) that no foreign participation of a technical nature would be involved, (8) that maximum use would be made of a cost plus fixed fee contractor or negotiated contracts, and (9) that existing operational and safety criteria for on-site and public safety would remain unchanged. There follows a two-page table of various aspects of the planned devices and shots by nickname with the DMA priorities and the DMA publicized readiness date as well as the lab readiness dates which didn't always agree and comparable estimated figures for DMA and the labs. Details such as location, depth of burial, estimated readiness date for the device and estimated readiness dates for the scientific experiments was included in this list which was a worksheet and on which certain notes were made by Dr. Graves that came out of the meeting. The list shows about 8 or 9 shots which could be ready prior to the end of 1961. All of the LRL shots which would follow their first shot on September 15th would be in tunnel U12e and all of the LASL shots following the first shot for September 16th would be underground in Area 5. The first DoD shot is noted as Hard Hat with the only planning date as early January for tunnel U15a. The two-page list includes shots all the way up into the following September and also includes the Gnome Plowshare shot.

AX

14 September

McCraw (ALOO) to labs: needs immediate lab requirements from weapons production system and stockpile.

d

14 September

TWX from Schwartz (SLA) to Betts: For test capabilities under various conditions:

d

3

- 1). Balloon tests lead times 3 weeks at NTS -- 90 days at EPG.
- 2). Exoatmospheric (50 to 1000 km):  
 --J. I. Thor plus rocket diagnostics: 6 - 8 months  
 --Polaris from ship: smaller payload but <6 mos.
- 3). Outer space:  
 18 - 24 months

14 September

Ogle talked with Col. Kiley (DASA) about 57's. LASL desired them available to monitor underground shots but didn't want to make a formal request. Some (but not all) of them were off to Australia but at least one would be around for our first shot.

j

In a 14 September TWX Schwartz of Sandia gives his feelings to General Betts of the atmospheric testing capabilities under various considerations. He discusses surface testing using balloons and feels that a response time for the NTS be about 3 weeks whereas for EPG it would be about 90 days. On the subject of high altitude and outer space testing he notes the availability of Thor and Atlas boosters to lift various size payloads to the desired altitudes. He further notes the availability of small rockets and dicaps for diagnostics. As for response times it is estimated that using only ground based instrumentation or companion rockets Thors could perform high altitude testing from Johnston Island in about 6 to 8 months and using onboard instrumentation and dicaps probably would require about 12 to 18 months. Smaller payloads might be tested by launching them from the Polaris launched from the Norton Sound or a operational submarine on a shorter time scale. Area of outer space testing which would allow testing of yields one megaton or larger it is estimated that 18 to 24 months would be required to develop a site and prepare for such shots.

A

The first proposed shot is to be a LASL device planned for 14 Sept. in existing hole U3-AC.

September - 61

US fires low-yield nuclear device at underground testing range in Nevada.

CR

15 September

Reeves to AEC: authorizes H & N to proceed with study and preparations of cost estimate for activating Eniwetok facilities. No action authorized.

S

3

15 September

First U.S. underground shot (LRL).

Meeting #1773, 15 September 1961:

Following lengthy discussions on Operation Nougat at earlier meetings, **NG**  
the discussion at this meeting was of the Commission's letter to the  
President requesting authorization for the test series, Commissioner  
Graham recalled the Commissioner's had said the letter should point  
out to the President the desirability of authoring the Commission flexibility  
to make changes in the test program, which would not be significant,  
as had been authorized in previously test series." The Commission  
approved this letter for the President at this meeting.

On the same day, the Commission approved a letter to the President  
on the Plowshare Program.

Earlier this day, Haworth had discussed with Jerry Johnson the draft  
of the "Report on Atmospheric-Underground Nuclear Test Considerations,"  
and the updated draft would now include additional information on the  
cost of underground versus atmospheric tests.

DASA message to Field Command on same subject on 15 Sept. gives direction to  
Vela Uniform data from Antler, Eel and Yukon based on current Vela technical  
objectives for those Vela Uniform events scheduled for corresponding Nougat  
operations. Also, the message gives direction to gather close-in surface motion  
data from Jordan, Pecos, and Chena shots using funding allocated for Crystal.  
There is some suspension of A & E work for Hard Hat. **HO**

The 15 Sept. 61 memorandum from the Chief of DASA to the Army and the Navy is on the subject of project proposals for Operation Nougat. The memo forwards a copy of the current proposed schedule for Nougat which includes 15 tests, 13 of which are AEC development tests and 2 of which are DOD effects tests (Hardhat and Marshmallow). DASA notes that the Dept. of Defense is studying the existing guidance for planning for testing and has so far permitted DASA only to plan for tests of weapons effects in an underground environment and not in outer space, the atmosphere or underwater. In anticipation of a change to this existing guidance DASA asks the services to review their requirements for events and come in with their most urgent experimental needs for atmospheric and other tests.

JF

16 September

First LASL shot.

17 September

Soviet Union had carried out 12 atmospheric tests by this date. (unclas.)

3

September - 61

US Secretary of Health, Education and Welfare, Abraham Ribicoff, reports sharp rise in fallout over eastern and northern parts of US but says it does not pose public health danger "unless radiation levels of this range are sustained over a long period of time."

ER

On 18 Sept. 61, Gerry Johnson sent a draft paper entitled, "Nuclear Test Program," to the Deputy Sec. of Defense. The paper has been coordinated with DDR&E and DASA and apparently is the same as a draft to be presented to the AEC for approval immediately. If approved, apparently the paper would go to the National Security Council who requested such a study by NSA memo No. 87.

JB

18 September

U.S. Secretary of Health, Education and Welfare, Abraham Ribicoff, reports sharp rise in fallout over eastern and northern parts of U.S. but says it does not pose public health danger "unless radiation levels of this range are sustained over a long period of time."

M

There is a great deal more discussion in these files but now I start getting into an area where we have plenty of documentation in other files, from other sources, so I will just mention a few things.

An 18 September Memo in the NVOO files documents the facts that LASL is interested in further geological surveys at the Test Site, not as to what

AM

they might have to do with such as the Christmas Tree concept, but for . very deep hole sampling down to 6000 feet in Area 3 and also deep holes in other areas such as Area 15. The purpose of these discussions and requests for surveying is to locate areas that might be feasible sites for higher yield tests and just to learn more about the geology as well as to avoid the ground water problem in certain areas.

AM

19 September

Sixteenth Session of UN General Assembly opens.

m

19 September

Ogle reported to WWG on first two tests, containment, and plans. Westervelt and Cowan reported on alpha and radiochem. from LASL shot.

v

19 September -61

Sixteenth Session of UN General Assembly opens.

CR

761

B

19 September

AEC to President: notified him of probable need for atmospheric tests.

C

2

On the 19th of September Seaborg transmitted to the President a paper prepared by DMA, I believe the Test Branch, entitled "Nuclear Test Program", which is in response to an NSC action memo No. 87 which requests a comparison of the effectiveness of testing nuclear explosives in various media. The study addresses the rationale behind the various types of tests of nuclear weapons that are felt to be necessary for tactical weapons, smaller weights in missile warheads, lower fission yields for cleaner warheads, and developments in the ABM effects area. The need for weapons system tests and weapons effects measurements are stressed as well as the continuing need for a Vela program to improve our methods of monitoring a test ban treaty as well as improving our intelligence capabilities. In the environmental impact of the various types of tests be they weapons development or weapons effects are detailed here. The type of testing versus the media in which it can be performed is addressed throughout this study and there are a number of recommendations at the conclusion. First of all that the planned test program proceed for the next year under the assumption that it will be conducted underground and that steps be taken to provide for an underground testing capability for the indefinite future and further that preparations be taken for possible atmospheric tests at the NTS up to a few tens of kilotons. Further that plans be made and activities be pursued by both the AEC and the DoD to bring the Eniwetok area to a 3-month readiness posture and that a completely seaborne operation not be ignored. Further that the Vela and ~~Blowdown~~ tests be planned to proceed underground

A

Meeting #1777, 19 September 1961:

Letters approved by the Commission at this meeting included a joint AEC/DOD letter to the President on the comparative advantages of atmospheric and underground testing, which would now go to the Secretary of Defense for his signature. Also approved was a letter to the President on the follow-on test series.

NG

Also mentioned was the report of an increase of off-site radiation level following one or both of the U. S. tests at the NTS and the need to develop meaningful and realistic information on this.

A 19 September TWX from McCorkle to Gen. Schriever of Systems Command notes the on-going AFSWC discussions with ALOO and Mr. Hertford in particular on the AEC views and plans for atmospheric testing and certainly indicates a strong channel of communications between Hertford and McCorkle in which Hertford has told McCorkle it looks like there may be testing in the atmosphere at the NTS by 1 November and that there might be larger weapon testing in the atmosphere as soon as possible in the Pacific. Hertford intends that AFSWC will serve as the Air Force single point of contact for all such relationships. McCorkle is telling Schriever that unless he is otherwise directed he will serve as the focal point for Air Force interest in any future test series and feels that AFSWC is the best organization since certain other organizations have been deleted during the moratorium. A preliminary view of an airdrop/air array operation which has been discussed between the AEC, AFSWC and EG&G is presented and McCorkle asks for Schriever's support as well as his communication of such a concept up the chain of command to the Chief of Staff.

BZ

In the folder containing the MLC minutes, the report of the 19 Sept. 61 MLC meeting states that a memorandum by the MLC was written to DMA on test planning.

A preliminary summary of the US testing since Sept. 61 and its effects on Force planning was published by AFSWC in Aug. 62, entitled, "Analysis of Preliminary Results of 1961-1962 Nuclear Tests and Implications on USAF Systems," SWOP 2-0445. About half of this document is devoted to the details of technical measurements performed on the various device tests to date by the various technical projects. Also, in looking at the results of each test in various ways, AFSWC comes with suggested implications of the test results on aeronautical systems, ballistic missile systems, command and control systems, and space systems. From this they conclude that certain types of weapon development and effects tests are required and set forth an updated priority listing for future nuclear tests.

HR

Here is a message from Betts to the Laboratories and Operations Offices on 20 September 61 which gives approval to proceed with OPERATION NOUGAT and contains a number of details for this operation, including a planning board meeting for NTS

PN

operations for the 27th of September. I believe I have taken notes on this document elsewhere but in particular it includes a number of items directed to provide capability for balloon shots as well as underground shots at the NTS.

Here is a whole series of monthly progress reports of the "Optical Measurements Group," with the first one dated 21 Sept. 61 and covering the month from 15 Aug. to 15 Sept. Some discussion of the experiments being set up for the upcoming Chena and Feather events at the NTS is given but there is no mention of any other test activities. From the format which is in an outline format and skips certain Roman numerals, letters, and numbers, at various times, I infer that this report fits into a larger progress report which has all of the headings filled in and perhaps is an L Division monthly

PH

Following the resumption of testing, a 21 September 61 TWX from Reeves to the ratory testing personnel gives the status of balloon inventories at the NTS as ows: four four foot shot cabs and one six-foot cab, with Sandia authorized to ease this inventory; six balloons which will carry 2000 lbs. to 1500 ft. and balloons limited to 700 feet; five partial reels of cab control cable, limited ngth to maximum altitude of 1000 feet unless spliced (additional cable has been orized); helium trailers and anemometers. Also, rehabilitation of the balloon in Frenchmen's, Area 7, and Area 9 has been authorized. NT

Here is a 21 Sept. 61 memo from Reeves to Ogle, Nielson, and various AEC PR personnel on "Cost Estimates - Weapons Program, NTS." The guidance and specific details to be planned for the overall weapons testing program, divided into the Nougat program and the mid-range program are of some interest and there are a number of shot locations, yields, readiness dates, for each program which probably should be kept in full and therefore I will make a copy of this confidential document for our classified files.

In a meeting on 21 Sept.<sup>61</sup>, documented by a message from Reeves to Sullivan and H&N on 22 Sept., H&N was authorized to perform time studies and make cost PR estimates for supporting an atmospheric program at Eniwetok and Bikini for the 2 laboratories and the DOD as well as a program of 5 missile shots for the DOD

A 21 Sept. TWX from ALO to DASA Field Command notes that the AEC is considering the feasibility of accelerating operation Nougat to the maximum extent and also the possibility of resuming atmospheric testing such as was done on Hardtack II, i.e., small yield atmospheric tests at the NTS. The capability of the DOD to support is requested and certain specifics are noted such as B-57 support for sampling, etc.

P

- 20 September Froman (LASL) answered McCraw (14 Sept.) with review of LASL's past, present, and future methods of procuring devices.
- 21 September No clearance for atmospheric tests but labs looking at costs and devices for atmospheric tests.
- 21 September TWX from ALO to DASA Field Command notes consideration of possible atmospheric test resumption such as low yield NTS tests. Request DOD support such as sampling capability, etc. Betts to labs on same subject.

d

c

p

s

Here is a 22 Sept. memo within Field Command on a meeting at H&N in Los Angeles on 21 Sept. addressing the possible reopening of the EPG. The AEC laboratories and other offices were represented as well as Field Command and what was addressed was the status of the Eniwetok facilities and the possibilities of what the laboratories could field and what the various organizations could support for testing there in the near future. Gibbins of Livermore stated that they could be ready for some tests in about 90 days whereas Al Graves stated that LASL could be ready for 3 air drops in the 100 to 200 kiloton range in 2 months. Sandia discussed testing using balloons and said these could be made available on a minimum of 6 to 8 months as a system. Further, Graves stated that LASL "would resist a crash program. Why do anything in 2 months? If a decision is made to go back to the EPG for testing, let's do it on a sound progressive basis. Let the laboratories get together and decide what has to be done, and then develop a good sound program." The document also gives the report of Mr. Charles Kelley of H&N who reported the status of EPG and broke it out by noting that the 300 ft. tower on Parry Island (Elmer) is in good condition and currently be used for PMR activities and various other items on Parry Island as to their status. Further, he reported on Fred (Eniwetok Island), Up-Island sites, Japtan Island, Bikini Atoll, and the availability of barges (6 of the cargo lighter type available).

JF

10. There is no more correspondence here until September 22nd 1961, after NTS testing had been resumed and just as planning for atmospheric testing was getting underway.

FK

-38-

BY

22 Sept. 61, J-3 Report: Under the heading of NTS-Nougat is the following, "On Friday, Sept. 1, word was received to prepare underground testing at the NTS. Preparations got underway immediately at a very fast pace. Since both the J-1 and J-3 Groups at NTS received their instructions anywhere from several hours to 4 days before instructions were given to other agencies at the site, we were able to procure vehicles, radios, telephones, security support, and other logistic items long before the rush started, and to furnish them to LASL weapons test personnel on their arrival at the site. We were given particularly good communication support from REECO and the Bell Telephone Co. of Nevada as well as generally good cooperation from all support elements at NTS." A few details of the first LASL shot (Shrew) are contained here.

Here is a <sup>61</sup> 22 September message from Dr. C. Reichardt of Headquarters AEC to Bradbury Foster on the subject of Soviet high yield devices. He notes a request from DMA to the for comment regarding Soviet statements about high yield weapons and what is the mate of their capability. Reichardt believes that the Soviets have currently a bility to design a 100 megaton weapon weighing about 40,000 lbs. and to design and a thirty megaton weapon. He makes estimates of how long it would take such on either tested or untested to reach the stockpile in the Soviet Union.

NO

Here is a <sup>61</sup> 23 September message from Betts to Rex of Las Vegas AEC which notes that the President has approved the conduct of Nougat as a series of detonations, detailed here, as well as authorizing the expenditure of the appropriate materials.

LW

Here is a 25 Sept. memo from Sudgen to Reeves on this same meeting which may have been 20 Sept., and at which H&N was given guidance on preparation of this study for opening the EPG. LASL presented a short term program

PR

and "has ordered bomb cases and will prepare these shots for air drop over the Eniwetok lagoon." LASL desires fireball diagnostics, radio chemistry, and other photo diagnostics on these tests and feel they could have the devices ready in 2 months. H&N feels that they might be ready to support in 60 days and this would entail "reopening Parry Island and laying a target area in the northwest lagoon." Livermore's quickest program would be to have 2 barge shots,

There are 5 cargo barges currently on hand at EPG which could be utilized as shot barges and Livermore estimates they could be ready to fire in 90 days but H&N felt it would require at least 5 months to prepare for such shots. Both labs discussed a more relaxed approach feeling that LASL could easily do the 2 air drops in 6 months and Livermore the barge shots in 8 months. Next discussed was a longer range more extensive atmospheric program wherein both labs would desire to do 14-16 tests and the DOD about 5 shots at Eniwetok and 5 missile shots from J.I. Sandia discussed

their tethered balloon systems which could be made ready on a relative short time frame but a more reasonable approach would allow it to be done properly in 6-8 months. "H&N brief<sup>ed</sup> conference on the condition of Eniwetok and Bikini in so far as they have been able to ascertain from visual inspection. It appears that Elmer buildings are in good shape. Electrical and mechanical installations may have to be replaced. Overhead electrical ? distribution appears good. However, feeders will probably have to be replaced. The state of underground utilities is unknown and will have to be checked. The big problem will be obtaining a stock of equipment and material to support a test program. H&N has a roster containing 10,000 former employees and feels that manpower will not be too difficult a problem. Bikini would require extensive rehabilitation since, other than Nan 500 power plant, all other equipment, material, etc. have been removed to support Nike-Zeus." H&N will immediately begin working on the present drawings, preparing lists of materials and equipment required and going through their personnel files seeking the appropriate manpower. They will prepare 2 schedules, one for the crash 2 and 2 program and the other on resuming a standard program such as Hardtack Phase I as rapidly as possible. Cost estimates for FY 61 and 62 will be prepared

<sup>61</sup>  
A 25 Sept. TWX from Hertford to Betts documented these particular ideas for atmospheric testing as well as pointing out the possibility of a "quick and dirty" operation which could utilize a Task Force commanded by an Air Force Commander "of suitable rank who could staff his organization at the Kirtland location and logistical problems would be related only to military staging areas. Liaison only with OFO would be necessary." Herein, Hertford recommended Major General McCorkle for this particular role. PR

Two days later, Betts replied by message to Hertford noting that there is "insufficient direction to undertake such positive steps as designation of a Task Force Commander or a DOD support coordinator, even though I recognize the need for thinking and planning to meet such possible requirements." He indicated his desire that ALO continue such in-house planning.

The Livermore reply from Foster came on 25 Sept. and said in summary: "It is very probable the USSR has the capability to design and test missile warheads with 2 1/2 to 3 kilotons per pound yield-to-weight ratio. It is impossible to rule out a capability of designing warheads having ratios of five to six kilotons per pound. Such principles would quite likely require testing. Testing these warheads is technically feasible for the USSR to accomplish. . . . The designing of large yield warheads where weight is unimportant, is easy and probably did not require testing." Foster feels that the USSR would test yields up to and including 100 megatons either in the USSR or in the Pacific. NU

Following some correspondence which I have seen before in the next couple LW  
weeks of September mainly from AEC to the Labs on the subject of preparing  
contingency plans for atmospheric testing and joint plans for all development  
and effects testing, Foster sent a message to Betts on 25 September in response  
to the message from Betts on 20 September which notes "We have commenced  
two measures which will start to meet the requests to move with maximum  
attainable speed over the next few months in the weapons testing program."  
The first measure consists of transferring people from other Lab programs  
as quickly and to the greatest extent possible into the testing activities.  
The areas noted in which a schedule must be maintained and therefore no  
transfers are possible have to do with the Pluto Tory Tests as well as those  
people devoted to the Gnome Event of Plowshare planned for 10 December.  
The second measure has to do with placing some special groups on overtime,  
as Livermore has already placed a large portion of the mechanical shops  
on a 48-hour, 6 day week. Foster urges one additional measure to gain  
a lot more capability to address to the resumption of testing. He wishes  
approval to immediately put all Laboratory personnel on a sort of overtime  
program, where most people would go to a 9-hour day, 5-day week. Those  
personnel on shifts would then be scheduled on an 8-hour day, 6-day basis.  
Foster requests immediate consideration for this measure in order to assure  
meeting the present underground testing schedule as well as to support several  
advanced strategic warheads.

25 Sept. 61, J-1 Report: This is the first progress report following the  
resumption of underground nuclear testing and J-1 reports that the maximum LASL BY  
violation at the NTS for the new operation (Nougat) was 41 personnel on 11 Sept.

A 25 September TWX from Hertford to Betts, which I believe is documented elsewhere, notes meetings held among the various laboratories and Field Command and others interested in quick resumption of testing on 21 September and the results that LASL is ready to drop two devices within 60 days whereas Livermore could test a couple devices on barges within about 90 days and the further discussion of a "quick and dirty" air drop operation off either Hawaii or Johnston. Further, recommendations about how to perform a Pacific operation, which islands might be used, etc., and Hertford's personal preference and recommendation for an Air Task Group Commander (McCorkle) are presented. **BZ**

A 25 September letter from McCorkle to Gen. Whisenand of Systems Command Headquarters details the AFSWC problems with meeting the myriad of study requirements and support requirements, etc., now that testing has been resumed, especially in light of the reductions that took place during the moratorium. McCorkle earnestly requests assistance from Whisenand in creating an awareness at higher levels of the seriousness of the manpower and capability problem within AFSWC. **BZ**

There are a number of pieces of correspondence in here that I've seen in other files that address the activities and thoughts about planning or being ready to plan for atmospheric testing at the NTS and at Eniwetok should such authorization ever come. A TWX on 25 September from Betts to Hertford of ALO addresses certain actions that may be taken and others which may not be taken in relation to preparation for atmospheric testing. Among those which may be taken are selection of suitable balloon sites at the EPG, discussion with the military of various boosters and RV's that might be used for testing, detailed planning for fuzing and firing systems in conjunction with selected RV's, plans for diagnostic instrumentation and sampling systems, etc. The activities which are prohibited deal with procurement of additional balloons and flying of the balloons at this time. Further Betts requests a detailed proposal including a schedule and cost estimate for testing with the balloons at the NTS and EPG and for exoatmospheric testing. **A**

Also beginning about this time September 25th is discussion of the very short response atmospheric testing program which goes on for some time as documented **A**

The 25 Sept. 61 J-7 report indicates that they are now becoming involved in hardware construction and shipment for the NTS testing.

BY

25 Sept. 61, J-8 Report: J-8 is quite involved in some local activity as well as the following statement on the NTS testing; "Upon initiation of Operation Nougat, required equipment was packed in the trailer J-15-2 and shipped to the field. Units and associated cables were adequately supplied by GMX-7.

BY

The T & F system at NTS, installed and checked out by EG&G, was ready for operation.

Preparation for the Shrew shot proceeded in a reasonably orderly fashion - it is noted that certain experience with other activities became very valuable. Unlike previous Area 3 well shots, it was decided to keep the zero rack and associated power supply above ground. Although originally <sup>conceived</sup> as a method of saving a zero rack, the system worked so well in allowing check out of system integrity during canister lowering and subsequent backfill, as well as providing means for final alpha dry runs, the consideration is being given to its use on future underground shots.

BY

25 Sept. 61, J-11 Report: Charles Brown reports on the sampling system used on the Shrew event which "consisted of 8 high speed blowers located at 45° intervals on a circle of 50 ft. radius around the zero point, one sampling B-57 aircraft, and a pipe sampling system. All three methods collected activity." Specifics of the three different systems of sampling and their results are presented.

BY

EG&G has been requested to initiate construction of 8 SA-8B zero racks with the understanding that field modifications will be made as required.

Plans for a new zero site building to house the zero rack and associated equipment, the alpha rack, the weapons rack, and the alpha dry run gear have been reviewed with J-6. The building will be equipped and used on the next shot.

Support was given to J-11 (air sampling system), EG&G photo (zero fiducial), and Sandia (accelerometer measurements) on the Shrew shot."

25 Sept. 61, J-10 Report: Under the subject of Vela Sierra, the details of modifications, fixes, and changes to the presently being tested prototype are detailed, and it is stated "As a result of the USSR test resumption a maximum was put forth to get the prototype system integrated and operational as quickly as possible with available equipment. ....Shortly after the prototype system was made operational here at the Laboratory, it was dismantled and shipped to an advanced station along with other optical equipment to check its ability to detect very high altitude and space tests of the USSR. Hoerlin, Westervelt, and four technicians are engaged in this field operation."

In the area of alpha measurements at NTS, the details of alpha consistence design and placement as well as the details of the detection system used are presented. Preliminary results of alpha measurements obtained on the Shrew test on 16 Sept.

Chronologically, the documentation was a little mixed up in this folder with quite a lot from the September time period that I haven't yet gotten to which I will cover now. Here is a document entitled "Concept of Operations" which covers the use of an RC-121D aircraft and several other types of aircraft in a practice airdrop/diagnostics mission to be done staged out of McClellan Air Force Base in California and done off the west coast of the U. S. on about 14 December 1961. The purpose is for a rehearsal of the air drop array and some of the details of the rehearsal are presented here but there is no indication that this is anything more than a, CONUS practice for the off-Hawaii airdrop proposal.

25 Sept. 61, J-15 Report: Calculations and reports on the Vela Sierra and Uniform problems in the area of radiation transport and underground dynamic problems are continuing. The question of yield determination for ground tests is being addressed in detail and the relation between calculations that have been done for measurements in tuff to the problems of penetration of explosions in the Nevada sandy soil (desert alluvium) are being

"Specifications for time of arrival and pressure measurement for 10 kt. ground shots in Area 3 are being made. The evidence available indicates the results are more sensitive to equation of state perimeters than in the case of tuff. The yield determination should thus have less accuracy than for ground shots in tuff."

J-17 and J-19 are still solely involved in Rover activities.

26 Sept. 61, J-6 Report: Since the kickoff of test preparations and testing on 31 Aug. the following requirements have been laid on J-6:

1. Preparation of U-3 ac at 332 ft. depth for the Scarab. BY
2. Preparation of U-3 aa at 340 ft. depth for the Scarab.
3. Drilling and casing of U-3 ae to 665 ft. depth for the Tsetse.
4. Drilling and casing of some 12 more shot holes ranging in depth from 800 ft. to 2000 ft. The most optimistic schedule says that these will be completed by 1 Feb. 62.
5. Drilling of a 2500 ft. deep core hole in Area 4:
6. Drilling of a 6000 ft. deep core hold in Area 15.
7. Design of a "flying" alpha station to be located at the top of the holes which will save on coax cable.
8. Rad chem sampling and down hole hoisting cable assembly for the first five shots by Zia.
9. Preparation of cams and alpha detector racks for the first five shots by Zia.

37-

BY

Several other specific items involving the design and construction and placement of instrumentation as well as procurement of certain items such as tubing and connectors.

J-6 adds "It is readily apparent that if Area 7 balloon-type testing and wetok testing is mounted, either J-6 will have to obtain more people or pull them from Rover." J-6 is also supporting very actively some local activity as well as plenty of activity in the Rover program.

An NTS Planning Board meeting was held on 27 September and the preliminary report of this meeting on the same date went to General Betts to address various questions that he had asked the laboratories and the operations offices. Among other things the group addressed whether acceleration of the present short term program was possible and determined that not only is acceleration not possible but that the present schedule is optimistic. Furthermore, acceleration which might come to pass by resumption of atmospheric testing at the NTS was studied and it was felt that about 5 LASL events could

A

be accelerated but that the LRL events could not be accelerated since they are device limited. Also in regard to Pacific operations it was concluded that two air drops could be accomplished in two weeks and that a short term air drop program with ground based diagnostics could be ready in 2-1/2 to 3 months whereas a continuing program would require 6 to 9 months to be ready. A test of the Nike Zeus warhead with the Thor vehicle could be ready in about 6 months from Johnston Island. A decision as to whether support facility activity must await an atmospheric test resumption decision was not resolved. Attachments to the conclusions of this meeting contain a great number of details of the status of the various organizations to meet the different test schedules and test programs in the various areas be they underground or at NTS in the atmosphere. For instance the "quick and dirty" air drop program requires immediately establishing a USAF priority to obtain the air support establishing the test organization and calling on Kirtland who has two B-52 drop planes available immediately. Lengthy and detailed schedules including device types, sponsor, method of detonation, diagnostic capabilities, etc for the various types of operations are included also as attachments including the NTS underground program, the Pacific operations for the various types of programs; "quick and dirty", short term, and overseas operation; and finally for the Johnston Island program which at this time included only a Nike Zeus system test.

27 September

Agnew informed WVG that Betts (DMA) had authorized Nougat as a series of 15 shots through February 1962. LASL list of devices and availability dates for atmospheric tests presented.

B

V

*( TNG -40 (28 Sep 61) on "Weapons Testing" )*

This is just some notes, and not a piece of correspondence, in regard to a discussion between Ogle and Col. Keith Byrnes of AFSWC on 29 Sept. 1961. The subject was Air Force participation and LASL requirements for a "quick and dirty" air test operation. The 3 possible locations for this hypothetical operation are: 1) Open seas, 2) Johnston Island, and 3) Eniwetok.

D

*Timing*

About 2 planes would be needed to give bhangmeter and measurements, another plane for documentary photography, another plane for the actual air drop, and another plane for radiochemistry. EG&G would operate the bhangmeters, whereas J-16 would operate the ~~the~~ *Timing* equipment. George Cowan of J-11 said that for such a "quick and dirty" operation only one good sample would be required and he would hope two would be available. The notes state that Gen. McCorkle of AFSWC, Bob Watt and Ogle will try to get together sometime during the week of Oct. 1 to discuss more specific and any further information available at that time. These notes seem to me the first indication of the air drop capability which is better documented in the folder entitled "Dominic Operation Planning".

Note that there is absolutely no indication of any pertinent construction activities in all of these monthly activity reports and that the first indication of test resumption or increased activity for that purpose is in the report covering thru 30 Sept., where there is an indication that a number of AEC Headquarters personnel toured the Test Site on 28 Sept., including Luedecke and Betts. This was mainly because the NTS Planning Board meeting was held here.

PR

Holifield, then Chairman of the JCAE, and Ramey, still executive Director of that Committee visited the NTS on 30 Sept. thru 2 Oct. for orientation and tours.

A 29 Sept. 61 message from Bradberry to Betts comments on immediate changes in the Lab. posture and funding picture due to weapons testing. "It is possible that 40 to 50 man equivalents could be shifted from Rover to the weapons program in J and GMX divisions more or less immediately. Another 40 to 50 could be added to the overall Lab. staff in the course of the next twelve months in order to meet the demands to appear to be shaping up and to reduce as much as possible the impact of these demands on Rover and reactor programs." This will mean an increase in weapons program costs of about 1 and one half million in FY 62 and 2 and one half million in FY 63. "Additional fund requirements for weapons components will depend largely on the level of activities at TA-49, for example, if these activities are to remain essentially shut down through FY 63, there will probably be enough in present LASL estimates to cover procurement of these items. However, it may be wise to provide for a hedge of \$750 thousand dollars in FY 62 and one million dollars in FY 63. to cover the possibility of an overlap." Bradberry states that it will be several weeks before the impact of weapons testing on reactor and Rover work will be clear but it is expected that "the effect on the former will be slight and we may be able

PX

29 September

Discussion between Ogle and L/Col. K. Byrne: subject was LASL requirements for Air Force participation in a "quick and dirty" air test operation. Eniwetok, J.I., and open seas noted as possible locations. Notes number and types of aircraft needed.

A 30 Sept. memo from Reeves to Ogle and others notes the current requests to contractors for estimates such as to develop necessary instrumentation and assume possible support of 2 airdrops over the Pacific and to develop necessary instrumentation and assume possible support of 3 airdrops at Eniwetok. A 3 Oct TWX from Reeves to EG&G asks them to provide estimates and develop the following; timing and firing photographic and alpha systems to support possible airdrop of 2 devices for a quick and dirty program to be accomplished off Johnston Island or Eniwetok Lagoon on a short-term basis (criteria should be coordinated with LASL and AFSWC), necessary instrumentation for an additional 3 shots EPG series as follows: 2 airdrops within 3 months with coordination to be accomplished with LASL and possibly 1 other airdrop in the spring of 1962 in coordination with LRL, and further preparations for an extended overseas operation at EPG to commence within 6 to 9 months.

30 September

Memo to Ogle from Reeves documents contractor study and planning for possible support of 2 air drops over Pacific open seas and 3 at Eniwetok.

Late Sept.- Early Oct. Bradbury's thoughts on preparations for atmospheric testing. Felt given President directive, air drop capability including sampling and bhangmeter could be effected in no more than about one week.

A 29 Sept. 61 message from Bradbury to Betts discusses possible additional needs and changes in the laboratory to support the new weapons testing activities. Bradbury states "It is possible that 40 to 50 man equivalents could be shifted from Rover to the weapons program in J and GMX Divisions more or less immediately. Another 40 to 50 could be added to the overall laboratory staff in the course of the next 12 months in order to meet demands that appear to be shaping up and to reduce as much as possible the impact of these demands on Rover and reactor programs. It is estimated very roughly that the increase in LASL weapons program hard core cost based upon the above would be approximately \$1,500,000 in FY 62 and \$2,500,000 in FY 63." Other costs that he mentions are weapons component costs and computer costs. Thus the very rough estimates at this time are that LASL required an additional \$2,500,000 over the currently programmed \$42,000,000 for FY 62. Apparently there has been some discussion about a proposal to transfer LASL personnel to permanent assignment in the Las Vegas Area and Bradbury feels that there is no net advantage in taking such a step. Finally, he says, "It will be several weeks before we learn what the impact of weapons testing will have on the reactor technology and Rover programs although it is expected that the effect on the former will be slight and we may be able to turn to outside assistance to help carry the Rover load."

Here is a 30 September<sup>61</sup> letter from Foster to Bet's in reply to the several requests for planning and coordinated response from the Laboratories in the way of test resumption. In the beginning of the discussion of the technical program, Foster states "Past experiences have taught us that a technically meaningful series of experiments at the rate and magnitude of the present Soviet Program requires something like a year of preparatory effort. We are not now ready to compete with the Soviets. We could within a few months make some high-yield proof-tests of designs weaponized during the moratorium. While such tests will provide a number of large explosions, they would probably contribute little to our progress. One of the major benefits to be derived from the resumption of nuclear testing is the possibility of developing advanced strategic warheads." Also he notes the area of warheads for tactical application as one that should not be addressed extensively. He divides up the response of this letter into several sections as follows: 1. which deals with the presently scheduled series of a dozen or so specific devices which are planned for test in Nevada between now and August of 1962; another section which shows additional experiments which could be fielded as early as early 1962 if the program were accelerated and which Livermore feels are concepts which should be developed soon; a third section of broader kinds of device developments which Livermore is addressing with theoretical work and physics experiments and along <sup>which</sup> the testing may be headed; a fourth section which lists the proof tests in which Livermore is most interested; XW-56X1, XW-38, and XW-58. They are less interested in proof-tests of the 41, 47, 48, and 55. It is noted that some of these proof tests could also be used as systems tests or in effects tests of such things as high altitude phenomenology. A few brief remarks follow on the major problems with getting the testing program under way and at a high rate of speed and, along these lines, Foster states:

'Finally, in increasing our rate of progress, it is extremely important to increase the number of both the small and large yield underground facilities. Operational plans must assure sufficient facilities, so that the temporary loss of any one of them will not materially slow the program. We are presently designing a high yield "Christmas Tree" facility, and construction of an additional low yield complex (G Tunnel) has been started. In addition, LRL feels that every effort should be made to <sup>thoroughly</sup>prepare EPG for testing on very short notice. It is desirable to have both EPG and NTS continuously available as needed to minimize operational interference with device and weapon developments." The letter finishes by discussing the need for expanding and improving support facilities, general construction, and manpower and budget changes required. Although for the time being the required additional people will be housed by crowding them into existing buildings, Foster requests authority to begin work on expansion of four buildings. As for manpower increases, Foster anticipates an increase of 590 people by the end of FY 1963. As for funding, he states "The incremental funding necessary to accomplish this goal is an increase of 16.3% for FY 1962 and 44.6% for FY 1963 over the existing Whitney budget of 49.1 million dollars. The details are spelled out in our budget letter." Part of his conclusion to the letter states "I believe a large and imaginative US program is desired if US leadership in this field is to be assured. Currently, the ability of the Laboratory to design and field new devices constitutes the main restriction. Within a few months, our program will have expanded, and existence of an adequate number of underground test sites will then be the limiting factor unless provisions are made now to assure adequate underground sites."

The final piece of correspondence in this folder is a 30 Sept. 61 letter from Foster to Betts which references several messages from DMA asking for Livermore's plans, proposals, etc. This letter contains details of a planned technical test program as well as device developments for the future. I will try to obtain a copy of this secret letter, No. BY 61-135, for our classified files. (IN "TEST PLANS" FILE) PP

In the area of EMP effects, in fall of 61, following test resumption, DASA invites numerous scientists from across the country, including military, AEC, and contractors to send the appropriate personnel to meetings at DASA Headquarters to address such measurements, apparently for any upcoming tests. JB

— Sep 61 ltr from AF-SWC to AFSC notes test resumption, demise of 4950th, and means about in-house shortage of personnel & capability to deal with present & projected situation. J