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"Readiness Report, 1 April 1959" by Headquarters 4950th Test Group (N) Kirtland AFB, New Mexico

The preface is quoted from here "This report has been assembled in order that units subordinate to the 4950th will have an appreciation of the state of Readiness of the group to carry out its nuclear test support mission during the present period of nuclear test suspension. Recently guidance has been received through channels which states in part: "No actions are to be consumated which would jeopardize or reduce the Air Force capability for continuous development and subsequent testing immediately following the termination of any test moratorium. Special care must be applied to prevent any degradation of capability in areas of planning, programming, personnel and other supporting activities." The report indicates planning and training progress being made as well as certain deficiencies and problem areas considered to exist. It further notes that such Readiness reports are planned to be issued from time to time probably on a quarterly basis. The letter sited above that directed the state of readiness to be maintained is noted as being Headquarters ARDC, RDSTE-12-2-6-E, 12 Feb 59.

The rest of the report notes the operation commitments of the 4950th. The major one of these seems to be support of air sampling missions with B-57 aircraft. Also, they are preparing documentation for air support of nuclear tests at NTS and Enewitok proving ground in the event that such would begin again. Also, 4950th has attached the name Early Bird to a planned operation consisting of approximately eight shots over a short duration test series in the event the nuclear weapons testing moratorium is ended. It is noted that the AEC has recommended that such testing be resumed in the event that test moratorium ends. Task Force Seven is envisioned as being the organization that would support such testing.

In the specific area of Sampler Aircraft it is stated "Sampler Aircraft requirements for the next foreseeable full-scale test series totalled twelve B-57 B's and four B-57 D's. As previously stated, this unit's present and projected aircraft inventory is eight B-57 B's and two B-57 C's. The C's will not be converted to Sampler configuration; the D's will be obtained from Strategic Air Command. Lead time to modify B aircraft to Sampler configuration is five months. This five months does not include assignment and transfer negotiation time."

April 1959:

Note that J-Division continues busy in other areas and especially in the area of explosion containment where several shots each month take place in various diameter and construction pipes as well as an aluminum sphere and a large steel container (Dumbo) there are plans for Dumbo to fire a 10 kg. charge in an empty container, in the container filled with nacl, and with a cylindrical air gap around the charge and the balance of Dumbo filled with NACL.

Correspondence between Teller and Bradbury in April of 59 is of interest since it has to do with the labs' roles during the moratorium and feelings about needs for future testing. The letter from Teller to Bradbury is not here, but it is No. BY-59-35, dated 23 Mar. 59. Among other things, Teller noted that within a period of some months, he feels the AEC labs will find themselves where they may be allowed, either by treaty or by unilateral declaration, to carry out tests underground or in outerspace. Perhaps the letter was asking for some sort of a joint push by the two labs to Washington to advocate these methods of testing and perhaps get more support in preparing. Bradbury's reply on 16 Apr. notes that LASL is not in general as enthusiastic as Livermore as to the possibilities of underground diagnostics and that generally the LASL opinion is that, since outerspace or underground testing will be slower and more costly, this will probably mean that shots will be harder to justify. Bradbury declines to take any active position or seek support along these lines expressing the feeling that the Geneva negotiations, among other things, have events pretty much out of the labs hands. He further feels that attempting to come up with an agreeable joint statement would be a formidable and possibly hopeless task and doesn't feel it is worth the effort. He concludes: "Isn't it certain that whatever decisions are reached in Geneva (or unilaterally) that the labs will pull in there belts and do their best to do the most important things under whatever set of circumstances are allowed? I'm afraid that I'm sufficiently impressed by the present status of the national atomic weapon picture that I doubt if the world will come to an end no matter how the Geneva affair finally goes. What may be a harder problem may be the matter of getting firm support in important research areas that will enable to keep our laboratories vigorous national assets as well as enable us to continue our various weapons responsibilities in an effectively and technically sound manner."

Memoranda beginning in Dec. of 1958, shortly after the moratorium began, indicate that JTF-7 personnel are investigating with the Navy support personnel, the possibility of utilizing LSD ships containing LCU barge type ships for conducting an open sea test operation. Apparently the LCU's would contain the devices or at least the targets and would be carried to open sea using the LSD. Further correspondence indicates that the Navy was planning to transfer six LCU's to the Commander of Task Group 7.3 per correspondence in Feb. 59. Also correspondence in Apr. 59 indicates the feasibility studies being done which would allow the gun mounts on the LSD type ships to be used in conjunction with the Mark 56 radar on the LSD to aim various types of diagnostic instrumentation equipment at the LCU at the time of detonation for open seas testing and diagnostic coverage.

CV

Apr. 59 correspondence indicates meetings and planning going on to put AEC High Altitude objectives together with DoD and do coordinated technical planning.

FQ

Meeting #63, 9-11 April 1959:

At this meeting, AFSWP, and Frank Shelton in particular, gave a briefing on the project HASP. As a matter of background, the program had originated in the fall following the LUCKY DRAGON incident in 1954. The request then that AFSWP study and evaluate the fallout problem resulted in the research program to define and delineate the stratospheric reservoir of fission debris (HASP) early in 1956. Details of this program and the technical results, although the conclusions are not agreed to by various agencies, are contained in the discussion in these minutes.

NH

59

A 10 April message from Starbird, probably documented elsewhere, addresses the LF Livermore Vortex Program, which will presently be justified on the basis of non-critical experiments.

7. A 10 April 1959 memorandum to people such as Graves and Ogle from Task Group 7.1 and specifically James Avery discusses some of the background FK for the open sea operation. The concept basically would utilize a landing ship dock (LSD) landing craft utility (LCU) combination. The LCU would support the device at the selected zero site and would be transported by and launched from the LSD. The LSD offers the capability to mount certain types of sensors on its gunmounts etc. Further noted in this memo is the FK desired inclusion of ships such as destroyers to be placed within the open sea operation to carry various other sensors and radar.

13 April - 59

CR

President Eisenhower, in letter to Soviet Chairman Khrushchev, suggests putting test ban agreement "into effect in phases beginning with a prohibition of nuclear weapons tests in the atmosphere" under simplified controls. CR USSR rejects proposal, saying it would only act to fan arms race, driving it underground.

A 14 April TWX from Stewart of DMA to the labs etc. addresses the upcoming briefing for the President's Scientific Advisory Committee. Subject of the briefing is current plans for possible resumption of testing. There follows lists of devices to be tested at NTS and also to be tested either at the EPG or over open seas. He requests LASL and Livermore comments as well as response times for the various tests that might be more than 90 days away.

C

A TWX from Bradbury to John McCone, AEC Chairman on 15 April addresses the question of laboratory morale and discusses where some of the laboratory effort might be redirected during the moratorium. (Criticizes present uncertainty and states positive decision even for programs other than testing would be better.)

Documentation in this time period addresses the terms of the Geneva negotiations, definitions of various proposals being put forth there and notes and discusses some of the questions of detection of various levels of nuclear detonations underground.

On 15 April, 1959, Bob Newman wrote a letter to Jim Reeves on "alternate full

NP

cale underground shot locations and facilities." The proposal is for four sites f two types (tunnels and holes) of containment facilities on RAINIER Mesa within wo miles of past Livermore shots, if Area 3 is proclaimed to be unsafe from the tandpoint of ground water contamination. Newman says that the Mesa is believed o be the only presently developed and/or available area within the NTS which eets all criteria. The proposal is for four shot points at a two thousand foot pacing for tunnel portals or four shot points at 1500 feet spacing for vertical oles with a minimum cover of 1000 feet, known media, no contamination permissible n ground water at producing water wells, and reasonably near existing roads and tilities as well as reasonable access. He goes into the details of locations of he tunnels and holes proposed with an accompaning map as well as specific roblems in access, power provision, telephone lines, etc. Only ALPHA measurements ave been taken into account in the design in a preliminary way of these facilities nd further diagnostics would have a significant impact. A rough estimate of the ost for developing the four tunnels is $7,000,00 and for the four holes is 3,000,000. He emphasizes, above all, that LASL prefers to operate in AREA 3 ause of the ease and economy of construction and operations and the readily ilable facilities, roads, etc. Finally, he requests that design, necessary site dies, and cost studies be initiated immediately for the tunnels and holes on NIER.

A 16 April letter from the 4951st Commander (Col. Steinkrauss) to the Commander of the 4950th, notes several problems at Eniwetok and their status. The Army personnel reduction which seems to be questionable is to whether it exists and the Navy personnel reduction which is down to figure of 40 or 50 are noted. The activity of PMR in the Eniwetok area o install a hydrophone net is noted and the fact that the 4951st seems to ave reached a pretty good point in numbers of personnel as to having nough to do but not too much is noted.

Correspondence over the next few months makes it quite clear that separate AEC and DoD thinking is developing diverse ideas of what high altitude's effects programs might look like. The DoD planning effort seems to be centered in AFSWP, the forerunner of DASA. The first meetings addressing coordinating these efforts took place in mid-April 59. From this time on planning on the AEC side seemed to be done jointly between Sandia and LASL and the code name for the committee was BUZZER and it was chaired by Taschek of LASL. Note that there is reference to the past accomplishments in planning for such testing by a Panofsky panel.

E

Apr 59 TWX on LRL "Vortex" prog...
Messages (1959) on General talks.
Ogle → Bradbury Ltr (30-469), 28 Dec 59
on "Readiness" of NTS

CW

L³/Merc. Files/Buddy Yahiku

ccotash" Folder

pr. 59 Memo COPB 4455 by V. Wheeler (L³) addresses planning for diagnostics riments for one-point safety tests. NO MENTION OF SUCCOTASH.

Several letters specifically on the testing program were written in the next few months by the Director or Gerry Johnson. The first of these on 16 April 59 from Teller to Starbird followed a message from Starbird on 13 April that gave some guidance on the funding and preparedness limitations due to plans for no tests in FY 60 but limited readiness capability. Teller sets forth a test program that Livermore would like to see pursued if testing could be resumed in the summer or fall of 59 and would take testing up thru Sept. 1960. In tabular form is presented those weapons developments shots as well as some Plowshare and detection shots which Livermore would wish to do with the site and device ready dates ranging from the 1st of June and fall for the devices thru 1960 and into 1961 in some cases. Over a dozen weapon development tests are specifically shown. After discussing at length the known geology of the NTS and the containment rules felt to be conservative (550 W to the 1/3rd or over-burden in tuff and 600 W to the 1/3rd or 0 point separation in neighboring tunnels), several tables of specific devices with the proposed tunnel site and the schedules for necessary construction to meet certain readiness dates accompany a detailed drawing of the configuration of the tunnels in Nevada to meet this list of some dozen and a half safety and full-scale weapons test. Noting that some immediate authorization for construction at the NTS would be needed to meet these schedules, Teller concludes, "As mentioned in the first paragraph, our suggested program is predicated on a change in these assumptions (limited funding and preparedness), and we would propose acting on it only in case the probabilities have altered so that those assumptions can be changed. It is an accepted fact that underground can be hidden. Considering that the U.S. has now made a proposal at Geneva which would allow underground tests for the time being, it seems appropriate to LRL to demonstrate that we are serious about underground testing by undertaking such a tunnel program now."

Here is a 16 April 1959 message from Ken Street of Livermore to Colonel Stewart of DMA which refers to a 16 April 1959 plan from Livermore for a proposed underground test program through about 1 September 1960. After presenting a list of many shots addressed to either detection research or weapons development with ready dates any time from June of 1959 into 1961, and noting that the proposal "covers primarily the same objectives as yours in the weapons development shots but differs substantially in the exploratory shots," Street states "The Laboratory believes that continuous 90-day readiness produces extensive wasted effort and funds, and will in the end lead to hurried and inefficient testing. Furthermore, we believe that because of the international situation, it is very unlikely that we will be permitted to test in the atmosphere in the near future; and therefore, that the most probable form of test resumption will be underground, and somewhat later, in space. We do not feel that being excluded from the atmosphere will severely hamper weapons development although there will be some delays in getting started on tests in the larger sizes. Therefore, we strongly recommend that plans be made for orderly and essentially continuous underground tests as proposed in our plan and that tests in space be considered starting 12 to 18 months from now." He then gives specific comments on the tests proposed by DMA for underground and also, in the atmospheric regime, states "Assuming an unlikely EPG or ocean program, we do not believe that we can be ready in less than 6 months to do any more than very urgent "quick and dirty" tests." The final paragraph refers to specific DMA questions and states: "Sufficient diagnostics could probably be obtained in open ocean testing for all of the shots listed using the same techniques used at Bikini during Hardtack. However, some important diagnostic measurement could not be accomplished. Shots in the upper atmosphere can be performed but only very rough diagnostic data could be obtained next spring. In about 18 months we expect that acceptable measurement techniques would be developed."

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* In a TWX dated 17 April 1959 from Bradbury to Starbird, LASL responds to the 14 April request from DMA for specifics on LASL shot dates and shot requirements and desires. Listed here are about a dozen proposed tests for the NTS, about 8 or 9 of which are stated as being able to be fielded within 3 months. Also there are 8 specific tests listed as desired at EPG or somewhere in the Pacific, all but 2 of which are listed as able to be done within 3 months. Further, in the text that goes with these lists is the mention that, subject to the availability of missiles and prior full-scale tests for calibration purposes, the Eniwetok tests could be considered for high altitude testing.

C

* A 17 April TWX from Starbird to Harold Brown at Livermore and Carson Mark at LASL documents the fact that Al Graves and a man named Colgate are both presently in Geneva. The message contains for the consideration and comment of the laboratories a proposed treaty applicable to the atmospheric and underwater alternative prepared by the U. S. delegation. The extracts from the text point out that phase II of this treaty shall consist of the extension of the detection and monitoring system to cover underground and high altitude tests as later decided.

C

20 April 1959, J-3 Report: Further activities in the weapons effects test planning and evaluation area include studies of various aspects of overseas operations. Bob Snure of this group has been working with the Navy to access the suitability of the Mark 56 Radar and fire control system as a camera platform for test diagnostics; results of the tests are that the system seems to be satisfactory for distances up to about 14 nautical miles for a camera borrowed from EG&G.

BY

As the joint committee to study the future testing organization and the EPG is being discussed and the terms which they are to address set up under DMA, JTF-7, and AFSWP in the first half of 1959, the two sub-committees were appointed and their tasks laid on them. The first, which has been mentioned numerous times, is the Jeffrey Sub-committee and the Sub-committee No. 2 is chaired by Col. Jack Ledford of DASA, with the JTF-7 member Lt. Col. Phillip Loveless and the AEC member Lt. Col. Frank O'Brien. This committee is to address the "Shoot-When-Ready" concept and the term "when ready" is defined as the capability whereby a facility can be made operational in a time period consistent with the development and effects testing cycles.

Here are the minutes of the AFSWP instrumentation conference on Operation Willow-ABMA, held at Huntsville on 21-22 April 1959. The discussion certainly did address the use of Redstone missiles with pods for the Willow test.

Here is a report of a meeting in Huntsville, Alabama with the Army and various Washington and other agencies representated, such as AFSWP, held on 21 and 22 April 1959. The meeting addressed the use of the Redstone missile in the future for high altitude nuclear tests and design of such things as pods, telemetry, control, etc. The conclusions xxx include the fact that each missile will be equipped with from 6 to 8 pods each of which will have telemetry transmittors. Whether this design and contruction actually took place, I don't know.

There is a fair amount of discussion in April concerning the text of the proposed atmospheric and underwater treaty and, due to the interest in Plowshare at the same time, some questions are focusing on the limitations to the Plowshare program caused by the treaty as presently being drafted. One particular TWX dated 22 April from Harold Brown to Starbird points out the problems in being allowed to do the most obvious peaceful shots (for cratering) and how this would impact the proposed requirement to test only underground where the inference is that these would have to be contained.

Reference to a letter from Sandia to Starbird, Info. Bradbury, on 23 April which is filed in 310.1 - Upper Atmospheric Physics Group. The letter summarizes the concept, objectives and broad technical parameters of AEC participation in the high altitude tests.

Among the numerous pieces of correspondence dealing with the text and details of the treaties being tabled and negotiated at Geneva, there is discussion of an article covering peaceful uses of nuclear detonations, i.e., Plowshare, etc. One such piece of correspondence notes that there might be peaceful detonations given certain conditions, one of which is the party intending to detonate the device, provide the AEC at least 4 months in advance with the date, the place, purpose, expected yield, measures to be taken to be sure that there will be no substantial fallout, etc.

Meeting #1496, 23 April 59:

In executive session, several items having to do with weapons testing were discussed. McCone reported that that day he attended a meeting with Killian of the White House, Deputy Secretary of Defense Quarles, and Starbird, and agreement had been reached on various studies to be undertaken by various government departments in connection with weapons testing and test detection. The AEC would cooperate in a number of these and would be primarily responsible for the following: "the Berkner panel recommendation relative to undertaking an experimental test program to determine the perimeters of detection and concealment; determination of the feasibility, practicability, costs and timing of underground tests; and determination of problems of conducting tests in the atmosphere, but above the limit of detection by the Geneva system, and of establishing any limitation of altitude in view of fallout." McCone said that the AEC and the DOD would jointly try to establish test requirements.

McCone said that Killian requested the Commissions views on declassifying the Argus experiment and he asked for a staff reply promptly.

The problem of increasing weapon complexity was discussed and Luedeke said he would consider a possible laboratory study of this aspect.

As for future weapons tests, McCone said that "he had expressed the view at the conference that there is a need for distinguishing between weapons tests that are absolutely essential and those which are desireable. but have only marginal importance. As an example, he said at a request by the DOD for a 20 kiloton weapon with a plus or minus factor of two kilotons. Such a weapon would require several test detonations to perfect. On the other hand, the laboratories now can develop a 20 kiloton weapon with a plus or minus factor of 5 kilotons without conducting any test detonations."

8. A cross referenced message dated 24 April 1959 from Hertford to Lt. Col. JOsephson, Headquarters AEC, Col. T. Jeffrey, JTF-7, Duncan Curry, LASL, and W. D. Gibbins, Livermore, is filed fn "353.4 Planning" folder and notes that the Lab requirements for the Hawaiian support for an open sea operation have been received by ALO and a meeting is planned for 11 May

FK

* There is reference here to a TWX from Starbird to Hertford, Bradbury and others dated 242304Z April 1959 and filed under "201 Panofsky". The message lists certain studies related to testing and test detection.

A 27 April memo from Froman to MacDougall on the selection of priority of tests presents the possible devices and priority order for a possible resumption of testing both at the NTS and at EPG or overseas. He asks MacDougall (with FWC) to determine the order of priority of the LASL-sponsored tests in the two types of series, underground and above ground.

27 April 1959, J-6 Report: A variety of efforts continue surrounding the overseas and EPG weapons test capability. The criteria for LCU and LSD's for an overseas open sea operation continue to be detailed. A feasibility study of substitutes for shot barges is being written up. Design, engineering, installation, etc. of various systems for the EPG

BY

are in various stages of completion, such as modifications to the IBM building air conditioning systems:- 20%. As for NTS activities locations were picked for 4 1000-foot deep holes and 4 tunnels to contain 10 kilotons in Rainier Mesa with rough cost estimates made of 3 and 7 million dollars respectively and H&N has been instructed by the AEC to proceed with a study of the Rainier facilities for LASL. Further design of a mobile alpha station to serve either tunnels or holes in Rainier Mesa or 1100 foot deep holes in area 3 is proceeding after H&N reported that such a station is feasible. One of the new 500 foot safety holes in area 3 has been drilled and cased and a second hole has been drilled. Various other activities at NTS such modification of the area 7 balloon launching system are in various stages of completion.

— Christofilos (LRL) wrote & DV presented talk — "The Argus Experiment" — on 29 Apr 59 (Conf.)

* A TWX dated 29 April from Teller to Bradbury summarizes Livermore's evaluation of the current status of Radchem sampling and analysis as applied to underground testing. I will quote the last paragraph since it seems to have some useful thoughts: "In summary, we have satisfactory results by core sampling on the shots above a kiloton and some doubtful results based on insufficient experience on the core sampling of shots in the neighborhood of 100 tons. Conversely the vacuum pipe technique is reliable for these latter shots, whereas it is in an unproven state for the shots above a kiloton. One should note as a restriction that our present coarse sampling techniques depend on plutonium as a tracer and that new techniques will have to be developed in case plutonium is absent." C

A 30 April memo from MacDougall to Bradbury gives the shot priority lists arrived at by a group of lab personnel (MacDougall, Hall, Mark, Agnew, Ogle, and Roy) including a list for high yield devices, a list for smaller yield devices, and also a list of those desired for one-point tests.

29 April 1959, J-10 Report: Don Westervelt has completed a report on the subject of air flourescense and detection of explosions in space, presumably addressed to the Vela Program at this time. He also has made calculations of energy deposition, time resolved flourescense brightness, and initial x-ray fireball brightness for an explosion at 105 kilometers, one of the proposed altitudes for operation Willow. I believe this is a series of high altitude tests being proposed by the military. BY

The following will be some notes from monthly activity reports originated by 7.2 and begun covering the month of April 1959 throuth August 1959. This first report, in April, states "Morale remains excellent notwithstanding the uncertainties created by the proposed reorganization. Command emphsis on job participation and recreation activities effectively counter-act the effects of uncertainty." Reorganization planning was a concentrated effort in all activities, directed toward maintaining high standards with a reduction in scope necessitated by the new proposed strength of less than 400. Note that Mr. P. Ryan was the resident manager for H&N at this time. JC

Meeting #1499, 29 April 59:

NG

McCone read to the Commissioners a draft letter which Eisenhower intended to send to Khrushchev; Starbird recommended certain changes pertaining to inspections and the new scientific data now available. The Commission then approved the suggested changes and McCone requested Starbird to discuss this with Farley of the State Department.

Note that on or just before 8 May 59 Deputy Secretary of Defense Quarles died.

Ogle's feelings on the proposed Seismic program were sent to Bradbury in memo on 29 April which stated that LASL is indeed interested in doing a little of NP
ıe work on some of the subjects that is planning to investigate, such as
:coupling, but suggests that we inform Starbird that we cannot incorporate our needs
›r underground events in this program and still be consistent with the
:quirements. Bradbury's letter to Starbird on the subject on 1 May stated " the
:eds of are of such a nature that it does not seem possible to combine any
SL shots which are primarily for experimental, diagnostic, or stockpile purposes
:th them. Presumably, like all effects experiments they will demand a weapon
:eviously tested and of known yield. This of course is diametrically opposed in
ıaracter to an experimental weapons test. "

May 1959:

PT

Discussion of J-Division participation mentions continuation of the explosion containment experiments and presentation of those results at the 2nd Plowshare symposium. Also discussed at that meeting were "ideas for utilization of nuclear explosions in space as powerful tools for geophysical and astrophysical research. The test planning section discusses the details of what is going on at the NTS and EPG, theoretical work on Fireball analysis and measurement, data analysis on Teak, study and guidelines for retnal burn from high altitude explosions, work on a high altitude fluorensence code, experimentation with pinex geometery, calculation work on gamma ray measurements, and calculations and design for alpha measurement techniques, expecially underground.

Although Panofsky is anxious to get the panel's report completed in mid-March, e evidence is that the panel went on meeting since they had a meeting in Dr. llian's office on 1 May, 59 at which Livermore and LASL were in attendance. LE parently, Westervelt was the only LASL attendee and his brief summary of the udies to be done as a result of this meeting are as follows: "1. Repeat typical L calculation of the effect of shields on x-ray yield and source temperature ethe sceptical), D. Woods (no deadline). 2. Review fluorescence detection stem, making effort to simplify hardware, and estimate cost(P-1 and Westervelt). Clear up some details and summarize capabilities of system as a function of the mber of stations. Results to Panofsky during week of 18 May."

Here are some notes from a meeting held on 5, 6, and 7 May 59 at Headquarters EC to address the questions of underground and high altitude tests. A copy of his SRD document is in our file so that all the details of these meetings can be referred to. The study was undertaken by joint agreement between McCone, Secretary f Defense Quarles, and Killian of the White House staff. The discussions were ttended by high level personnel from the three Laboratories and ALO and several igh level DOD personnel. Attendees included Starbird, Bradbury,Hall, Ogle, Mark, eller, Johnson, Foster, Herbst, Fowler, Shuster, Hurtford, Reeves, Loper, Admiral arker, and others. A program was outlined to attain in general two types of bjectives: specific weapons developments applied to specific military weapons ystems, such as ATLAS, SUBROC, NIKI-ZEUS, and PERSHING; and tests addressed to reas of significant military value which can be investigated and possibly be eveloped, such as a warhead which can have 100KT in 100 lbs., warheads with nhanced kill effects from various types of radiation, etc. The program assumed urned out to be one of fourteen underground tests plus safety tests to begin on November 59 and proceed through 1 September 1960. Not coincidentally, 1 November 9 is the first day after the end of the one year test moritorium. This program is ased on the following assumptions: that testing will be only underground, that hey would address only programs that might benefit materially the National posture nd fit into one of the two categories above, and that the scale of testing would be apable of being carried out at reasonable cost with existing developmental effort nd could be continued over several years. Diagnostics will be as a minimum, ALPHA nd Yield and, since there is not a great deal of experience in underground iagnostics,much is expected to be developed in this period and numerous measurements ill be attempted. As to the feasibility of doing all these tests, it is not that here is presently and AEC panel of consultants addressing the question of the highest

eld safe for NTS, but the answer is expected to be at least forty kilotons. n the basis of the panel's conclusion and recommendations for further studies, is felt that substantially higher yield devices would not be reasonable for anning on the time scale being considered and therefore the shot list limits lmost everything to 40KT. Two shots, which might exceed this, are shown as ither full scale or a reduced mock-up. The specific locations for each shot re laid out which include for Livermore three locations in tunnel B, four ocations in tunnel E, and three locations in tunnel G; for LASL, four new unnels (L,M,N, and O) and one vertical hole in Area 3; as well as several unnels and holes in Area 3 for both Labs foe safety experiments. Also n the list are some granite and marble holes for the Seismic detection rogram. Some of the Livermore tunnel locations are already completed, n work, or funded, whereas only the LASL safety holes have been funded or ompleted. Thus, the overall budget to complete all these sites includes a otal of $52,000,000 through FY-60, of which about half has been funded or udgeted to date. Alternate locations are being looked into for yields eyond those anticipated as reasonable for the NTS. One of the conclusions is that a series can be mounted for underground testing that will be both feasible and reasonable in cost, and will give sufficient diagnostic information to advance most of the specific weapons developments and areas of investigation laid out at the beginning of the study. Note that the list of shots includes JERICHO, which is funded by the DOD. The final conclusion is "underground testing is, of course, more difficult, more expensive, and may result in less diagnostic information than might be desired or obtained under previous conditions of testing."

The same group also addressed the question of a Joint High Altitude Test Program, to test above the detection limits of the Geneva system. First of all, a list of those tests which might be desirable in the near

ure for the AEC and which can't be done underground was laid out and this came with eight devices(four for each Laboratory). Theses shots were addressed in two ways. From the first standpoint, desiring to test everything within two years, the only carrier planned on is the modified REDSTONE which can carry these devices to a five-hundred to one thousand kilometer altitude and would be ready to perform any of the tests by August of 1960. The second approach taken would be to perform the tests at altitudes of 100,000 kilometers or more as suggested by the Panofsky committee of the PSAC. To attain this altitude, four different boosters (CENTAUR, ATLAS, VEGA, AND SATURN) are all to be used with dates of readiness ranging from late 1960 to as late as 65 for the SATURN. Diagnostics, which are being worked out in detail by Sandia, will roughly be contained within detachable pods carried aloft with the Warhead, and ground based as well as rocket bourne diagnostic instrumentation is planned. The DOD is preparing an appendix to address the various missles. In the low altitude (five hundred to one thousand kilometer) range, three specific problems are mentioned that must be taken into consideration; electronic interference, retinal burn or flash, and atomopheric fall-out. Sandia is looking into the problems of missle failure, destruct systems, and associated safety devices. The status of the DOD WILLOW Program is also noted which includes at this point six tests, four utilizing REDSTONE, one utilizing the JUNO (JUPITER), and one a balloon shot. The cost estimates for the AEC tests are as follows: Close-in method-185 million; 100,000 kilometer method-$320,000,000; a third utilizing an improved ATLAS in about mid-61-$275,000,000. All three estimates include $100,000,000 to cover the DOD support. The conclusionsfor this method of testing highlight the number of items which require further study, such as the tremendous safety considerations, the fact

that only primitive diagnostics will be attained, and in general "that testing at high altitudes is much more difficult, more expensive, and may produce less information than is desired and obtainable under previous conditions of testing." Note that all of these notes from this May meeting are preliminary and are only in draft form. Also, on the former discussion of the underground section, of the fourteen tests laid out for the AEC purposes, nine are Livermore devices and only five LASL.

2 - 6 May 59: AFSWP redesignated DASA effective this date. FU

In a 7 May 1959 memo for the JTF7 commander and the chief of AFSWP, Mr. Quarles directs that the study be done and that the group organize in any way that they see fit to accomplish their task. He refers to the past documentation just described above and in particular notes that the paper provided by Mr. Loper just described in the previous paragraph served as the initial guidance for the group. The findings are to be reported to the Secretary of Defense, the AEC Chairman, and the JCS Chairman for further consideration. He notes that the armed forces policy council will consider the findings prior to approval by the Secretary of Defense. BO

The group lists their assumptions as to the probability of resuming various types of testing and the degree of readiness warranted;

1. Contained underground testing: this form of testing has the greatest possibility of being permited in the future; as for readiness it is

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believed reasonable to make a limited amount of preparation for this type of testing so that it could proceed, if permitted, with minimal delay.

2. High altitude tests higher than 50 K which is the limitation of detectability of the Geneva experts system: this form has some probability of being permitted in the future, which is much less than the probability of contained underground testing and that it is more probable that it will be undertaken from JI than EPG; no extensive preparations for these tests are felt to be warranted due to the low probability but the possibility is sufficiently great that investigations and plans for this type of testing should be kept under continuous review.
3. Very small yield atmospheric tests at the NTS or elsewhere within the U.S.: such tests have very little probability of early resumption; any detailed planning or preparation is not warranted.
4. Atmospheric tests on or over the open sea or under water: this form of testing seems to have a slightly higher probability than atmospheric testing at EPG but still little chance of being undertaken due to the general opposition to atmospheric testing; sufficient planning and investigation is warranted for these types of tests as necessary to prove their feasibility and address the resources required to undertake them but should not be to the extent of making any substantial expenditure of funds or talent.
5. Atmospheric tests at EPG: Early resumption of this form of test even with limited yields has an extremely small probability although the probability of such tests in the very long-range future is hard to determine especially if there were a severe break-down in relations with the Soviet Union; It is believed that the EPG should be placed on

maintenance stand-by status and that expenditures should be limited on EPG to those funds necessary to prevent deterioration of essential facilities to the point where their replacement or repair could cause a long-term delay in getting tests underway. It would appear reasonable to assume that after receiving the authority to resume testing there would be a period of nine to twelve months before extensive firings would commence.

In the section entitled "Facts Bearing on the Problem," significant facts noted include "JTF7 under current JCS directives is responsible for directives for and conducting tests involving nuclear weapons and devices outside the continental U.S. When deployed in the EPG, CJTF7 has been jointly responsible to the DOD and AEC and in this capacity is responsible for the EPG and all related activities. During the period between tests, the EPG, except for the military support, is a responsibility of the AEC." Further, the Army has programmed for the development of JI for launching missiles for the Nike Zeus test program with jurisdiction scheduled to pass from the Air Force to the Army on or around 1 January 1960. Also, it is stated that the EPG is the most suitable land mass outside the conus for conducting atmospheric tests. Finally, it is stated "guidance from higher authority indicates that the closing of EPG at this time, even if desirable, could have serious political and psychological consequences". Also, the heavy investments there as well as the possibility of important usage for various other agencies is noted.

The missions and detailed responsibilities of joint task force 7 during operation HARDTACK are detailed in Appendix B to enclosure F.

The 1959 agreement between the AEC and the DOD on costs and responsibilities

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for the Pacific proving ground is included.

Under the section entitled "Discussion" four areas are defined as basic for the conduct of this study and they are: a) types of future tests envisioned, b) the organization best suited to retain DOD testing capability, c) the level of readiness to be maintained in the EPG, in terms of personnel, equipment and facilities, and d) the adequacy of AEC-DOD agreements pertaining to nuclear testing.

It is noted that for planning for future testing, the main tests under consideration at the present time are those concerned with TRUMPET and JERICHO at the NTS and WILLOW in EPG or JI and the open sea.

As for testing in various environments in the future, the working group created a sub-committee to study a "test when ready concept". They felt that the two most probable testing scenarios would be completely contained underground shots or out-of-the-atmosphere shots, missile launched from Johnston Island, with the former presently having an existing capability at the NTS. Based on this, the sub-committee's efforts were directed toward a shoot when ready concept for out of the atmosphere shots. For this particular concept they stated the following: "This concept is defined as a method of conducting nuclear tests as a requirement develops, limited only by the time period to prepare for ~~this~~ the scientific and technical requirements of the experiment. During the time frame considered (an eighteen month lead time as required for operation WILLOW), the Army will have completely reactivated Johnston Island for its Nike Zeus test program. Arrangements can be made with the Army to support nuclear tests launched from Johnston Island, using the same people who would already be there for support

for the Nike Zeus program. The only remaining requirement for a complete shoot when ready capability would be for a test director and staff (exclusive of forces from the services). Few if any task force personnel would have to remain at Johnston Island full time. Rather, as a test program, the test director and his staff, together with the forces required, would deploy to Johnston Island and be supported by the existing base complement under the terms of previous agreements and proceed to conduct the tests. Any action to implement this concept for testing should be made on a decision to resume testing, but consideration should be given at this time to prevent entering into any agreements or obligations at Johnston Island which may later preclude this concept from being implemented."

Under a discussion of the organization for future testing the responsibilities of the DOD versus the AEC are discussed and it is noted that where the AEC conducts proof tests of weapons designs they also have been responsible generally with determining the diagnostic information for the general tests. It is further stated that where initially the AEC undertook substantial effort to determine effects information in various environments, with time the responsibility for effects determination had been taken over in large part by the DOD. In relation to the new DOD responsibilities given to DASA it is stated that "DASA under its new charter, has the responsibility for supervising DOD atomic weapons test activities and for assisting in operational evaluation tests of atomic weapons systems involving nuclear detonations and coordinating other DOD programs for investigation of atomic weapons effects. In supervising the conduct of full scale DOD weapons effects tests, DASA" has a variety of responsibilities that are enumerated here.

The study committee in trying to determine what type of organization and what lines of command or control best served the interests of both AEC and DOD

considered three possible solutions to the problem. Proposal A was a solution in which JTF7 would become a subordinate command of DASA. Thus during non-test periods, the Task Force would revert to the control of DASA and liaison would be maintained with the AEC through the DMA. Proposal B is a second approach in which JTF7 would be assigned to DASA for administrative support only but would be responsible to both the DOD and the AEC at all times as in testing situations. Proposal C is a third approach which would visualize disestablishing JTF7 and placing its functions in existing government agencies. Under this third plan, only a test planning board composed members of field command/DASA and ALOO would be retained. The study group considered the three alternatives and, considering the fact that the AEC requires joint control only after the decision has been made to resume testing, concluded that the proposal A would be the most efficient and acceptable organization.

As for manning decisions, it was recognized that JTG7.1 presently located at Los Alamos, would not be required during the interim period and therefor it was disestablished with the military personnel returned to their respective services and the action to be completed by 31 August 1959. Furthermore, headquarters JTF7 and Task Group 7.2 (at the EPG) were reviewed and 7.2 is reduced from 559 to 393 and headquarters were reduced to 56 personnel as of 14 July 1959. As the study progressed and the possible manning figures under the three proposals were clarified, it became clear that there would be less manpower actually required under Proposal C than under Proposals A and B, which would have approximately the same requirements. It was finally determined that "in order to maintain readiness capabilities under the assumptions provided and to perform the functions set forth in the charter for Proposals A and B, it is estimated

that the following personnel will be required: headquarters JTF7: 77; task group 7.2: 32; task group 7.3: 90; task group 7.4: 7; for a grand total of 206 personnel." These figures represent a 79% reduction in the number of currently authorized spaces. Furthermore, the DOD NTS support unit would be augmented by about 25 people from field command DASA. To facilitate obtaining any future military support required from the services, it was determined that two permanent task groups, 7.2 and 7.4, should be established similarly to task group 7.3, as recommended by CJTF7 in his 29 November 1958 letter.

As for the future status of the proving grounds, the study group determined that the NTS was in the process of roll-up and since the AEC has the responsibility for operating the NTS, no reason was foreseen to change this arrangement, withhold scheduled construction, or curtail military roll-up operations. A sub-committee formed to investigate the feasibility of phasing down the resources in the EPG to a maintenance stand-by status came to the following major conclusions and recommendations which were submitted to the Assistant to the Secretary of Defense (Atomic Energy) and the AEC general manager:

1. Consolidation of base camp facilities on Eniwetok Island.
2. Consolidation of AEC and DOD depots.
3. Moth balling facilities and equipment on PARRY Island.
4. Recomputation of heavy construction requirements, scientific stations, and associated equipment maintained in a moth ball status.
5. Boat Pool be reduced in size and the remainder stored in Pearl Harbor or otherwise disposed of.
6. Locally based aircraft be returned.

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7. Airdome at Eniwetok must remain operational and provide for twice weekly MATS flights.
8. AEC contractor should assume the entire communications responsibility in EPG.
9. No further construction in EPG should be undertaken except for minor mods on Eniwetok in consolidating the base camp facilities.
10. Subject to recomputation, a total strength of 495 personnel (69 of which would be DOD) will be adequate to conduct maintenance standy-by operations.
11. An apportionment of operating costs between AEC and DOD which will reflect a transfer of functions and division of cost support activities is appropriate.

In addition to the two proving grounds the status of Johnston Island was considered and it was noted that control ~~had~~ would have passed from the Army to the Air Force for the Nike Zeus program at the beginning of 1960. Furthermore, "the chief DASA has been requested to coordinate any DOD test requirements with the services and any other interested government agencies. In the event it is necessary to conduct high altitude tests as proposed in WILLOW, Johnston Island would be the logical launching sight for any high altitude nuclear tests."

The study group looked at existing DOD and AEC agreements and considered only three as presently effective: the AEC/DOD agreement on costs and responsibility for the pacific proving grounds, the amendment number I to that agreement, and a paper containing the mission of JTF7. As for specific changes to these agreements they would be dependent upon which portions of this overall study were approved and implemented in whatever detail.

Appendix A to the enclosure that discusses the overall report is a report by the sub-committee which looked at the organization for future test operation based on a "test when ready" concept. The "test when ready" concept probably deserves some discussion. The sub-committee and the working group as a whole concluded that the two most likely modes of testing and those considered by this study would be underground and high altitude or very high altitude tests and more or less disregarded other types of testing as too unlikely to consider. Furthermore, in feeling that the NTS facilities and programs and planning for underground testing more or less took care of that concept for future planning, this sub-committee looked only at the high altitude test requirements. Feeling that the extensive preparations and large amounts of money that would be required for rocket-borne testing and diagnosing and measuring effects from such tests would lower the number of tests that would be done by this method, the committee concluded that we would not test in a continuous manner or in a manner where there would be a series with a number of tests as in previous series but rather would have a "test when ready conce pt". It is stated that this would provide a "flexib le method of operation, independent of time, scope, or place, in which the AEC or DOD would test separately or jointly as the requirement would dictate." The committee suggests that the traditional method of testing on a "series operation" basis has become obsolete and uneconomical if surface or atmospheric tests are out-lawed. Briefly, the committee's recommendations were that the test when ready concept be adopted as the best solution to maintaining a future test capability in light of current estimates of probabilities, that the nucleus of a test supported organization be established on a permanent basis, that Johnston Island be specifically designated and prepared as a ready test ~~site~~ site and that the first mission of

the test support organization would be to determine in a coordinated effort between AEC and DOD, the minimum requirements for the preparation of JI as a ready ~~sights~~ site .

Copies of the charters of the AEC, DASA, and DASA field command are included here for information.

Details of the three proposals for the change in the JTF7 structure during the moratorium are contained herein with charts of relationships between the AEC and DOD and the JTF7 organization, numbers of enlisted and officer personnel that would be assigned to which organization, etc. Under Proposal A the command structure would contain a headquarters, JTF7, with three task groups 7.2, 7.3 and 7.4 representing the Army, Navy and Air Force assigned permanently and any other task groups such as the AEC 7.5 task group assigned as necessary for planning.

Here are notes on the meeting held at the AEC in Washington on 7 May 1959 JA

on the subject of "Technical Capability of AEC/DOD Willow High Altitude Program." The LASL representation was Carson Mark and Don Westervelt and Livermore was JA
representated by C. Violet and O. Vance. Generally, DOD's objectives in Willow are: energy partition as a function of yield and altitude; anti-missile kill radii; extent, magnitude, and duration of communications-electronics interference; and threshold for retinal burns. The general AEC objective is to calibrate a diagnostic measurement package to develop a technique for conducting weapons development tests outside the earth's atmosphere up to 100,000 kilometers altitude.

SF A 7 May meeting between the AEC and DOD is being discussed to address the objectives of both sides for a high altitude program (Willow), including the JA
measurements that the AEC would wish to make on the effects test, the nomination of warheads to be used, the compatability of the objectives of both sides, and the compatability of the AEC instrumentation systems with the DOD pods and missile systems as well as the scheduling. Also, starting about this time there is plenty of correspondence on the committee and sub-committees which are addressing the future of the EPG, the testing organizations, etc.

A joint conference to address retinal burn calculations and conclusions is to be held at LASL on the 15th of July with Hoerlin, Latter, Lelevier, and others in attendence.

Here's an interesing paper from before the moritorium from Doyle Northrup to Killian on 9 May 58. the letter is in reaction both to the deliberations of the Bethe panal to Killian looking into the possibility of monitoring a test ban as well as the public record on administration statements and press reports on positions of people such as bethe. Northrup has been and still is trying to emphasize certain of the qualifications on the ability to detect and identify and monitor a treaty

although he doesn't feel that these points are emphasized enough to the non-technical officials making the statements and I assume the highest decisions. He also feel that the press has oversimplified and not qualified some of Beta's statements about whether the Russians would cheat and whether an adequate control and inspection system could be set up. Thus he is setting out specific data based on experience and analysis on just what could and couldn't be done under certain types of detection systems and what vast areas of uncertainty there are.

His final two conclusions are that "adequate data are not available to acurately asses the detection and identification capabilities for underground tests in the USSR" and certain limitations as well as lack of analysis of current tests "greatly degrade the realibility of assessing the present state of Soviet weapons developments in terms of comparable US developments. It is doubtful if the realibility obtainable is adequate to the needs of a decsision as far reaching as that of test sesation."

Starbird, Farley, and Scoville of CIA all received copies of this letter.

A lengthly report on seismic, acoustic, and electromagnetic systems for monitoring was forwarded to the State Department and Jim Fish on 25 June 58. This detailed report on system capabilities and limitations also emphasis the absolute need for inspection and other intelligence to complement the detection stations and technical monitoring capabilities.

Note, that in a meeting on 12 May 59, Luedeke reported on the upcoming adjournment of the Geneva talks until 8 June 59. The Commission agreed that the AEC representatives, Al Graves and Sterling Colgate, should return to the US and a meeting should be set up with the Commission to discuss the conference negotiations with them.

AG

On 13 May 59, Colonel A.G. Thompson of the 4950th forwarded a preliminary study on future sampling capabilities to LASL and Livermore noting the specific aircraft being addressed and requesting the Laboratories to review their requirements particularly in the high altitude (above 55,000 feet) area, and to make comments on the study and recommendations of what seems to fit their needs including the possibility of rocket samplers.

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Again on the subject of ground water contamination, a 13 May message from Hartford to Starbird discusses the current status of a study by consultants George Maxey and Sheppard Powell. They are considering the containment and possible ground water contamination from 1100 foot deep shots in YUCCA FLAT. The construction of these holes and the carrying out of these shots with the appropriate instrumentation is requested by ALOO to investigate, among other things, the movement of water and the contamination problems. The tests are to be 10 kilotons at 1100 feet deep. The schedule of completion would have the following dates for the four holes: 29 August, 8 October, 16 November, and 1 December 59. ALOO recommends immediately proceeding with a program of drilling and casing, provision of facilities to the area, procurement of machines, etc. at a cost of $869,000 and the overall program including cabling and all equipment is estimated at short of $2,000,000. Furthermore, the consultants are looking into the problem of what the largest yield that can be fired at NTS with no danger of ground water contamination is.

NP

Not actually an NTS Planning Board document but an inhouse Livermore memorandum from R. Petrie to W. Gibbins, dated 11 May 1959, concerns the construction at NTS versus the projected funding picture and in particular outlines the recommendations for the continuation of fiscal year 1960 construction within funding as quoted by Sewell in a 23 April memorandum. The basic philosophy is to obtain the best utilization of available funds to maintain an increasing 90-day capability which means construction on each side tunnel would be stopped approximately 90 days in advance of the estimated detonation date. This 90 days would be broken down into 60 days of additional construction time plus 30 days user occupancy time. By so utilizing their funds LRL would effect a sequential increase in the number of tunnels in a state of 90-day readiness. The tables and figures in this memo note the presently approved and ongoing work in tunnels U12e03 and 04, on safety tunnels U12i, j and k, and in tunnel U12b03 as well as the fact that funds have been allocated for other activity like postshot exploratory work, LASL safety holes, granite digging and other things in FY '59. LRL lays out here the details of recommended work to be done in tunnels B and E and G, I, J and K and the amount of estimated cost and time it would take to reach 90-day readiness for these various shot locations.

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"353.4 TEST MORATORIUM (1 MAY 1959 THROUGH 31 MAY 1963)" Folder

This is a continuation of the notes on these particular folders which were begun in the previous time frame filed under Ref. letter C.

A 14 May 1959 TWX from Starboard to Bradbury and Teller discusses the NTS vortex facility and Starboard states that the initial justification would be based on its use for certain experiments.

Due to the grave implications of going forth with this program he asks for a joint study by LASL and Livermore of the probable benefits of the experiments, the types of experiments, and those measures which could be used to assure that the expected would not be exceeded, and he would probably use this joint study in talking with the commission about the future of the Vortex facility.

A TWX from the 4950th to the 4951st dated 14 May 1959 notes the high level study now going on to investigate reducing support at the EPG to a Caretaker Status and the impact on the 4951st. Wignall notes that Gen. Canterbury (Commander of AFSWC) desires that AFSWC retain command control at Eniwetok.

BU

Meeting #1507, 14 May 59:

This meeting began with a consideration of two AEC papers 580/84 and 580/85 which were planning estimates as of this date as well as a weapons development status report to be used by the DOD in planning for future weapons development and production. These items were being treated specially since the Commissioners realized that the DOD would treat these estimates and statuses as hard facts in projecting their own need for weapons systems and request for device development for the years to come. This discussion and the approval for transmittal of these papers was followed by a discussion of the Geneva talks with Graves and Colgate present. All of this, which is classified, will be obtained for our files.

Here is a 14 May 1959 transmittal from Starbird to Teller (which I assume also went to Bradbury) containing a draft "Report of AdHoc Committee on Test Requirements," who met in Washington on May 5-7. The draft begins stating "The AEC and the DOD were requested by the principles of the Ad Hoc Committee of Advisors on test negotiations (Chairman McCone, Secretary Quarles and Dr. Killian) to review jointly requirements for additional nuclear testing." The Ad Hoc Committee which was set up is composed of representatives of DMA; the ATSD(AE); The Chief of DASA; the Manager of ALOO; the Directors of LASL and Livermore; and the Vice President for Research of Sandia. This Committee has reviewed the present status of weapons development visavis the background of present and near-future defense requirements and also, in somewhat broader terms, the types of technological advance which might be possible by testing. The DOD further is addressing the effects of nuclear detonations which would require testing. The group in their discussions and in this report have categorized the weapons possibilities and developments into four categories as discussed in little detail here. First of all, exploration of new possibilities, an area in which the absence of testing seems to the group to foreclose the possibility of significant progress. The second area has to do with meeting the DOD warhead characteristics of systems whose development is already underway. The warhead re quirements of a number of systems, including the Minuteman, Polaris, Titan, and Nike-Zeus, are specified with the nature of probable compromise due to the lack of testing being briefly noted. As for the

third category, proof tests, the DOD considers certain criteria demand that certain designs be fully proof tested which have not yet been and these are listed as: XW-54, Moccasin, XW-47, and XW-48. The fourth category emphasized by the DOD, is the areas of critical defense importance where the effects of nuclear weapons are not well understood and can only be explored by further testing. Among the major categories are high altitude effects, water surface and underwater effects on submarines, ships, and aircraft; and x-ray effects on materials.

The conclusions of the Committee on this draft report are:

"A. The foregoing of all testing in the future will handicap, but not preclude the AEC's offering to the DOD warheads to meet existing or near-future DOD system requirements. Certain warheads offered by AEC will fall short of DOD desires in regard to assurance of performance, amount and predictability of yield, or other characteristics.

B. The exploitation of certain fields of longer-ranged DOD interest, which could lead to significant changes in weapons systems and doctrine, could not be accomplished without further testing.....

C. Foregoing further testing will preclude obtaining effects and phenomenological information required by the DOD, of which the higher altitude effects are those of highest priority."

Two appendices to this report are intended, the first detailing the estimated achievable characteristics and the methods of arriving at such designs, prepared by the AEC for various devices. The second appendix, to be prepared by the DOD,

is not detailed here but apparently will have something to do with the military requirements for devices versus what may be possible.

A 15 May 59 message from Starbird to Teller for Stirling Colgate at Livermore addresses possible technical discussions at Geneva. Apparently Colgate is to the Geneva discussions and they may begin about 1 June and address first the high altitude detection problem. This may be followed by further technical discussions on underground detection. Starbird wishes Livermore to address certain questions of underground detection as to programs and time scales to attain data for such discussions in the following areas: extremely small shots in small blocks of salt or other material; somewhat larger HE shots; further effort at trying to understand the Tamalpais-evans question. This latter has to do with a very different Seismic signal from two tests done during HARDTACK at about the same yield. Livermore is to have a meeting within a few days to crystallize a program for HE and neuclear firings to address such things as decoupling apparently. Starbird notes that Bradbury is looking into the matter of the instrumentation for high altitude detection.

NP

A 15 May TWX from Starboard to Bradbury and Mdnar of Sandia discusses the Vela Hotel Program although not by that name. It talks about the role of LASL having overall responsibility while Sandia would assist as appropriate in looking into the instrumentation for satellites and the signal transmission problems, etc., including the Westervelt-Hoerlin fluorescence possibilities. Mentioned are two pertinent reports, one by a Panofsky panel and one by a Berkner panel which Graves is bringing back to LASL, and the possibility

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that there might be another Geneva technical conference of experts beginning about 1 June on this particular problem apparently. Starboard reminds that the Panofsky committee came up with the statements that certain instrumentation appeared to make the satellite detection system feasible and recommended that eggineering of this system proceed in order to give a better basis for estimates of capability. In a 15 May TWX from Starboard to ~~Moner~~ Molnar, he states that in connection with this TWX to Bradbury on the possibility of a new Geneva technical conference that he desires Moner to provide him with an assessment of how much we can tell the Soviets about the possibilities of getting information from an outer space detonation, without revealing design information on our weapons or classified information on diagnostic detector information or elemetry.

18 May 59 TWX from Starbird to ALOO on DOD subcommittee which is addressing phasing down EPG in 59 to a maintenance standby, i.e., no facilities deterioration or equipment disposal beyond a 9-12 month response capability. Among other things, may mean H&N personnel phasedown. Study group appointed by Secretary of Defense and Chairman AEC (i.e., Parker, Starbird, and Gen. Anderson - CJTF-7) appointed this smaller committee. Subcommittee to visit ALOO 25-26 May.

FN

LASL Director's midyear review, 25 June 59, // DIR-1461.

The Livermore answer on 18 May 59 from Harold Brown began by addressing the high altitude question and stating that Livermore feels a convincing argument on shielding of high altitude shots can probably be made to the Russians without revealing substantial weapons design information. With respect to the underground situation and decoupling experiments, Brown feels that probably an incorrect answer with a short term program (in a month or so) is of less value than a correct answer in a year or so. It would be extremely difficult to get anything meaningful in a month or two from new experiments. The problem with decoupling is not whether a large enough hole will produce decoupling but whether such a hole can be made, at what cost, and what the effects of inelasticity are. LRL, however, will look into the problem of a crash program as well as the possibility of Lined holes. In further messages, Livermore discusses with DMA the various possible tests, such as very small shots in salt blocks, and evaluates whether they are useful at all and which ones ought to be pursued for which reasons. This was the beginning of such things as PROJECT COWBOY.

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An 18 May TWX from Starboard to ~~Hurford~~ Hertford and Bradbury notes a telephone conversation with Al Graves on the subject of reassigning all 7.1 personnel and this TWX is to clarify Starboard's intent. He states that he has already told Admiral Parker and Gen. Anderson (of JTF7) that he concurs in inactivating 7.1 and reassigning the military to do these outside the AEC. The only exceptions would be a few military people not in 7.1 to work on other items such as the Rover Project or perhaps an overseas planning office affiliated with ALOO.

18 May 59 TWX from Starbird to Hertford postpones Sandia H.E. cratering tests due to public comment, etc. FN

A 19 May TWX from Jim Reeves to Multiple Addresses including the 4950th note that the Geneva negotiations and the forthcoming Foreign Ministers Conference make it inadvisable to declassify and discuss in any open way the OXCART Program. This apparently is a plan to detonate two low yield devices to provide data on cratering effects versus depth of placement for the PLOWSHARE Program. BU

There is a very useful and informative drawing here, No.L6-9244, from LRL dated May 1959 which shows graphically the planning for construction to reach a 90-day readiness in these tunnel complexes.

AT

On 19 May 1959 General ~~Starboard~~ Starbird sent a lengthy letter to Major General Anderson, Commander of JTF7; and Rear Admiral Parker, Chief of DASA that was addressed to certain sections of the study for future test operations being worked out between these three gentlemen and their organizations at that time. As for the assumptions on types of testing, Starboard noted that the attached list was the best idea of which types of testing would have probabilities of being carried out if we could return to testing and it was here that atmospheric tests got a very low probability from the

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AEC. Also included in this letter is a lengthy discussion of the internal AEC procedures for planning for and carrying out test operations as well as pertinent organizational charts of the people and organizations involved in the areas used.

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A 19 May Trip Report by Col. Rose of the 4950th discusses his conversations in Washington with JTF-7 personnel. Noted is the current future test organization high level committee discussions and report. Also noted is that the sentiment seems to be to have DASA take over top control for atomic testing for the time being but that the AEC is expected to favor a separate organization of the JTF-7 type. Furthermore JTF-7 is of the opinion that all permanent Air Force testing organizations such as the 4950th should be assigned to them permanently for both administration and control. JTF-7 notes that there are no plans for any testing earlier than about the fall of 1960 which might be approximately 4 shots. Also noted is that JTF-7 was about to write a message to AFSWC directing action be taken to reduce or eliminate the helicopter and L-20 air support now at Eniwetok with the attendent personnel reduction but that this will now be just a general letter requesting an evaluation of the situation with the reductions made whereever possible.

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A 20 May TWX from Monar to Starboard answers the questions concerning outer space testing as to the details of the devices and the rocket-borne experimentation that would be utilized. It gives the details of the few things that Monar thinks it would not be wise to mention to the Soviets explicitly such as measurement of

Cross-referenced here is a 21 May TWX from Starboard to the Labs on the subject of meetings during the week of 5 May concerning the necessity for proceding with the program to check the possibility of underground decoupling. Furthermore, there was a meeting held in Livermore 18 May on the same subject

BR

Along these lines, a 21 May 59 message from Starbird to the Operations Offices and Livermore directs some work to begin investigating the feasibility of HE detonations in salt mines in Louisana or Texas. NP

Here is a 22 May 59 message from Starbird to Harol Brown which addresses the high altitude and underground technical discussions at Geneva. Neither is underway but Starbird wants to clarify some points as to what data may be needed there and what things may be discussed with the Soviets and possibly which things should not. He wishes a report relative to shielding of high altitude events prepared by Livermore so that it can be cleared for classification and available to the Geneva Delegation before it is needed; DMA requests it by 5 June. In relation to the underground detection, DMA feels that the information passed to the Soviets will not go into the LATTER-BETHE hole theorybut will address decoupling. Acknowledging the fact that a short range crash program will probably not produce the desired results, he reiterates his early suggestion of "the possibility of Laboratory or very small and early shots and detailed investigation of the EVANS-TAMALPAIS results". In regards to this "it would certainly be nice to be able to present some simple information that dramatically supported the idea of decoupling at any time the issue might arise. I hope, therefore, that you continue to think on the matter, and that you will particularly try to find something significant and useful in the EVANS-TAMALPAIS analyses." NP

Meeting #1511, 22 May 59:

NG

For the first time in a while, Plowshare got a great deal of attention in this Commission meeting. In particular, Starbird noted the change in the scope of the Harbor project in Alaska (Chariot) and, as the Commission had previously requested if additional expenditures were required, he was now explaining the need for certain studies to be done and the additional funding requirement of about 1. 3 million dollars. As near as I can gather, the Commission seems to approve continuing the surveys and plans for this project at additional funding levels as of this date.

Starbird also informed the Commission that two salt mines (in the Houston and Louisiana Gulf Regions) appear as feasible locations for testing the Latter Hole theory. Time required to prepare for the tests is estimated at 60 to 90 days and both mine owners have been approached. Arrangements are being coordinated with a committee consisting of Killian, a State Department Representative, and a DOD representative. A joint press release is being prepared to answer questions regarding the use of high explosives.

One of the two items discussed in executive session was seismic test preparations.

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LRL/Mercury

"NTS Planning Board" Files

There is some historical documentation here of the formation of a committee called the "Committee on Use of the Nevada Test Site" in 1957. The minutes of the third meeting on 28 May '57 show the fact that the acting chairman was a Mr. Paul Ager, that the lab representatives were Bill Ogle and Raemer Schrieber, Dale Nielsen and Jerry Johnson of UCRL, and Hollingsworth and Mel Merritt of Sandia. This particular meeting focused on the use of the NTS for the Rover, Pluto and fast reactor programs and in particular addressed the location for the Pluto and fast reactor facilities.

The first mention of the NTS Planning Board in the LRL/Mercury files is a 25 May 1959 TWX from Sewell to Graves and Ogle and others date group251757 May '59 on the subject of the next meeting of the Nevada Planning Board which is to be held 4 June 1959. On 2 June a TWX from Sewell to the same people finalizes the agenda for the meeting with the people to do the discussions as follows: (1) presentation by users.A.LRL-C. Violet B. LASL-Herman Hoerlin, C. DASA-Col. Leo Kiley, D. CETO-R. L. Corsbie, E. Sandia-D. Shuster. (2) Review of capability to meet construction, support procurement requirements necessary to attain and maintain the "90 day" readiness for the proposed programs-Holmes & Narver. (3) Review of Hardtack two underground shots with respect to their containment for the following types of sites: A. tunnels-G. Pelsor, LRL, B. vertical holes-Herman Hoerlin. (4) Brief review of fallout from all underground shots in Hardtack II - K. Nagler, USWB. (5) Brief review of wind study and discussion of adequacy to meet needs of programs planned for NTS - P. Allen, USWB. (6) Review of balloon experiments by Sandia Corporation and discussion of future plans for balloon development program - D. Shuster, Sandia. (7) Presentation of other new programs planned at NTS and their safety aspects: A. Fast criticality facility (Vortex) - F. Fairbrother, LRL. B. Scientific application of nuclear explosives (Project Sane) - Herman Hoerlin. C. Plowshare - Vay Shelton, LRL.

25 May 1959, J-3 Report: It is stated here that unofficial notification was received of a decision to inactivate the military portion of task group 7.1 and transfer the military personnel from Los Alamos and Livermore during the next 2 or 3 months. Also planning is continued on the technical modifications necessary for using

BY

the LCU/LSD/destroyer concept for open seas shots which will be based at Pearl Harbor. Plans were sent to Task Group 7.3 who will coordinate with the Navy on feasibility. Furthermore Sandia Corporation which is working on the aero-balloon program reports that the program has been set back 6 weeks due to a strike

A 25 May TWX from Bradbury and Monar to Gen. Starboard lists the items that the Laboratories will work on in relation to the outerspace testing and diagnostic program, which will include studies of various possible detection systems and telemetry systems and recommendations for any preliminary satellite, rocket, or surface observations which would be pertinent. Furthermore, it is noted that a joint LASL-Sandia working group is set up with Taschek as the chairman and LASL membership being drawn from P, J, and T Divisions with Sandia membership including Schuster, Cook, and Vaughn. The time frame expected when the committee will come up with anything significant beyond the Panofsky panel report is about four to six months. The labs feel that in the mean time the Panofsky report is certainly adequate to provide any need that might be needed by any Geneva panel of experts or any other similar group. Since this will be a fairly laborious undertaking, the Labs ask that the reality of the jointness of this effort with the DOD be clarified as soon as possible.

BR

By a 26 May 59 letter, Molnar, President of Sandia, sent to Starbird a response to a 14 May letter from Starbird on the subject of Underground and High Altitude Testing Problems. Sandia did a couple of studies of the high altitude test possibilities and include two lengthy studies here. They address in particular the safety problems both with the missle and with the nuclear warhead and how these might be overcome, as well as methods of instrumenting high altitude shots with packages attached to the warhead carrier vehicle. The primary information that will be provided for each test will be yield, and other discreet information on fusing and firing, neutron source emission, and position of instrumentation relative to the burst. Also detailed are the method telemetry and positioning. This reply addressed particular documents sent by Starbird which were drafts on the underground test problem, on which Sandia had no comments, and the high altitude test problem on which Sandia had numerous comments.

59

26 May TWX from DNA notes that following the current recess in the Geneva
lks it is desired that Graves and Dr. Sterling Colgate return to Geneva
participate in the discussions beginning 8 June and that their participation
limited to about six weeks.

28 May 1959, J-6 Report: Actual work at the EPG is as well as planning for an openseas concept are continuing. As for NTS, plans for the 4 1100-foot deep 36" diameter vertical holes in area 3 have been initiated while the plans for the Rainier Mesa area have been cancelled while specific details of the hole criteria have been forwarded to H&N the latest information is that DMA will authorize design and preparation of bid documents but will delay authorization to invite bids until some unspecified later date; the estimate of cost for the entire 1100 foot hole development is about 1.9 million dollars. Other activities at the NTS include a review of the (I. containment) site and agreement that it will not interfere with LASL activities.

BY

Discussions in May of 59 between the Army and JTF-7 are addressing the construction requirements for Johnston Island for two different projects, Willow and Nike-Zeus. Each side wants to know what the other plans to do so that the construction can be coordinated and best use of overlap can be made. I am not sure but that the Willow planning is to use the Redstone and specific faciltities at J.I. but I haven't seen details that say this.

JA

June-July [illegible]: ~~The overall view of the lab activities seems~~ of the lab activities seems to indicate trend towards more physics research and calculation ~~and less testing~~ and experimentation by J-Division than had previously been done when there was more testing going on.

The July report gives the number of items under design or study by H&M for ETC which is interesting to read: new barge slip, Parry Island; open sea LCU shot vehicle; permanent reinforcement of base island buildings; ~~and temporary~~ antenna mast for LSD for open sea firing; soundproof and airconditioned CTU 1 & 2 offices, Parry Island; redesign IBM building airconditioning and emergency power; replacement of triangular towers with rectangular towers Parry and Enyu; redesign wells and drain, station 1312, Engebi; new office-lab building at IBM building, Parry Island; redesign roll-up doors on photo towers; study feasible floating replacements for barges; study feasibility [illegible] of permanent power plants [illegible], design barge mounted tower to replace Mack tower; and prepare post shot damage report for Hardtack.

In addition to planning, construction, and procurement for new vertical holes in area 3 at the NTS there is going on a design and field check of a method for cleaning contamination from all reusable holes used in Plumbbob or Hardtack I. "After cleaning a 50 foot concrete plug placed on top of the debris in the bottom would provide a minimum depth of 330 feet in at least 4 old holes, sufficient for 1 point applications." This was probably the method used for the first shot on Nuget.

Also in this report is the status of calculations and studies of water waves from nuclear explosions. Interestingly, some safe limits have been come up with and are the present guidelines as follows: "for example, if a wave height of 6' on shore at Hawaii is considered the safe limit, a 10 megaton open-sea barge shot should be located at least 800 miles away, while a 1 megaton shot need be removed by only 250 miles."

The concern about signal transmission in cableing in vertical holes 1100 feet or more deep, is leading to an investigation of the different types of cable used and "Phelps - Dodge has also offered to investigate cable design which might have [illegible]"

Here is a June 1959 document by Lou Wouters, entitled " -Diagnostic Concept," in which he expounds in some detail on this sort of a test in its simple through complex configuration and the various ways in which the necessary diagnostics would be obtained. I mention it because I believe it later was applied in the Gnome Plowshare period.

1 June 1959, J-10 Report: The contribution of J-10 to the second Plowshare meeting was that ideas for utilization of nuclear explosions in space as powerful tools for geophysical and astrophysical research were reviewed in the paper presented at this second Plowshare meeting in San Francisco.

A 3 June 59 letter from Starbird to Loper (MLC) notes that until now, the AEC is not known who in the DOD would be responsible for executing or at least discussing the various Panofsky panel recommendations and notes that he now understands that DOAT-1 has been assigned the prime responsibility. Starbird states that Bradbury and Colnar have their organizations ready to conduct joint studies of the details of possible detection systems, design of an overall program to obtain data, etc. and Starbird requests Loper reply as soon as possible so that the various responsibilities can be appropriately assigned and work can get underway on the "overall study program for high altitude testing and detection." A hand-written note by Froman states that Bethe is talking to Starbird tomorrow on this to try to get us a clear statement of ASL (AEC responsibilities, etc.)

Here is a 4 June 1959 memo from the Commander of Task Group 7.3 to JTF-7 (the commander is F.L. Ashworth) on a report studying "Maximum Reduction of Task Group 7.3 Personnel Commensurate with Anticipated Workloads." The task group is JA at this time divided into two parts, the headquarters in Washington and the boat pool at Coronado. As for the headquarters, the minimum number of personnel required through 1 Sept. 59 is 13 officers and 14 enlisted men and 1 Sept. 59 could be reduced to five officers and five enlisted men, with the recommendation that the JA commander still be an additional duty of a Rear Admiral assigned to duty in the office of the CNO. The headquarters currently occupies Bldg. 126 at the Naval Gun Factory. As for the boat pool, the present strength of 3 officers and 110 enlisted men should be maintained through Sept. 1 of 59 with a possible decrease to 1 officer and 25 enlisted men by the 1st of Jan 1960. This would be a satisfactory nucleus to support a build up for open seas or EPG testing in the Pacific. It would necessitate mothballing and storage of most of the equipment in the custody of the boat pool. If this small nucleus could not be maintained then the response capability for a typical EPG operation would be at least 2 years. Even with the small nucleus of personnel, the boat pool would require at least 4 months to be ready for an openseas or a Johnston Island type of testing situation.

4 June 59 meeting: This included discussion, among other things, of the Labs capabilities and requirements to meet a 90-day readiness for underground testing in Nevada. The Board concluded that this readiness would be achieved by 1 August 59 making 1 November the earliest realistic date for resumption of underground testing. Capabilities would then allow firing at a rate of about one per month for each LASL and Livermore in the following year. To reach this readiness state, approval is needed immediately for the LASL mobile ALPHA station, and approval for 1100 foot vertical holes in Area 3 is needed if other than 1. safety tests are to be done. Of particular interest is the group's discussion of the Livermore "fast criticality facility."

The Board concluded that they approved the selected site and agreed that even though some radio activity will be produced, this proposed facility will not create a safety hazard. The minutes of this meeting, circulated to the Group Members by Sewell on 17 June 59, are lengthy but contain extensive details of the shots desired by the Laboratories if testing were resumed and the projected test capability requirements at the NTS. I wouldn't be at all surprised if the 1 November 59 readiness date, which agrees with a 90-day readiness capability by 1 August, wasn't due to the fact that the one year moritorium would run out on that date. The discussion of containment, indicates that a 400W to the one-third rule seems to be acceptable to some people, even though the tunnels did not contain during HARDTACK. This seems to be blamed on the zero ~~ke~~ room being too large. Hoerlin gave a summary of the LASL underground shots showing the percentage of activity released and whether the concret block was blown off or intact following the shots. Ogle pointed out that the question of radio chemistry samples had to be considered versus complete containment and affirmed that LASL had the capability for complete sealing if requested to do so. The discussion indicates that LASL seemed to plan for some release of activity for sampling purposes whereas Livermore seemed to be addressing the problem to attain complete containment. Also being prepared is the Sandia balloon capability which Shuster felt could support on 90 day notice with aerodynamic balloons in two or three areas at the NTS.

M&R Record Center PC

"201 Teller, Edward" Folder

The only item of interest in this folder is a 5 June 59 message from Teller to Starbird and Bradbury which supplements to the statement made by Teller on the need for testing and the possibilities with testing. Generally, he feels and sets fort in detail that though possibilities of weapon development have in the past been due to having a somewhat optimistic outlook on a new idea and pursuing and feels that philosophy should be applied into the future. Further, he sets out five porposals for weapons developments of enhancement of effect which he feels should be worked hard for in the near future and so that some testing is needed. One of these listed is the so-called radiation bomb which releases most of its energy in the form of neutrons or gamma-ray, rather than in blast and heat, and I believe was also known as the neutron bomb.

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5 Jun 59 TWX
Starbird → Elliott (ALCO)
concerns xfer of military out
of LASL & assumption of
duties by military personnel
in ALO area & the labs. DT
(59 military xferred out as
manpower reduction)

pp

The next update is forwarded by Johnson to Starbird on 8 June 59 and lays out a specific program to begin testing with a 1 Aug. authorization and the first shot on 1 Nov. 59 (90 days readiness with the first shot 1 year after the moratorium began). The first three shots would be safety shots in tunnels I, J, and K whose construction is underway and has been authorized. The other 9 tests plus 3 contingencies which are listed would begin after the safety tests but the site preparation in some cases has been started but in most cases requires further authorization. Specific readiness preparations would cost some 3.6 million dollars in FY 59 and 5.5 additional million in FY 60 with an additional 9 million or so needed to prepare sites for actual tests once the go ahead for testing is received. 4 of the weapons test listed are called "heavily diagnosed" shots and would require about 9 months lead time to prepare the diagnostic experiments. By this letter, Johnson requests authorization be given to increase the tunnel preparations to meet the overall readiness program which would begin new construction just about immediately which would carry over well into 1960. A 22 June TWX reply from Starbird to LRL (No. 1041) states "Authorization for the proposed construction is withheld pending an overall review of the effort at NTS now underway. Presently authorized construction will continue until the end of June." Starbird anticipates an effort of lesser scope than indicated in the Livermore letter.

Meeting #1519, 8 June 59:

NG

McCone is enroute to Geneva at the request of Secretary of State Herter for discussions relative to the Foreign Ministers meeting there and the conference on nuclear test cessation.

59

An 8 June letter from Art Cox to Francis Porzel of the Armour Research Foundation in Chicago notes that Newman is proceeding with designs for 1100 foot holes for LASL 10KT shots. Also, Brownlee is proceeding with hydrodynamics calculations in soil and Woods is doing similar calculations for SALT. Cox requests any references to information on the equation of state for ice due to consideration of that medium also.

NP

An 8 June 59 status report by Shuster of Sandia on Sandia's balloon development gram contains information on the flights of a 5000 lb. payload balloon and a 000 lb. balloon. Both have been tested at the NTS, and experiments to investigate feasibility of incorporating a Pinex experiment in a balloon configuration have been formed. Also design studies of balloon installation for EPG have given the indication t it would be feasible to carry payloads to altitudes of about 5000 feet in the EPG.

NT

59

June Memo from the Deputy Commander of the 4950th to the Commander the 4952nd Support Squadron at Kirtland discusses the role of this Squadron ing the moratorium. The new mission statement includes the fact that the adron is responsible for the technical operations including the assembly launch of research rockets and the various peripheral tasks in analyzing and performance.

BCA

7.2

9 The May progress report indicates a 10 June reorganization date and preparation going on for transfer of property accounts and readjustment of personnel assignments. JC

of 7.2

The June activities report indicates that the reorganization was accomplished on the 10 of June with an appropriate formation and ceremonies and that conversion to the new table of distribution was accomplished smoothly and no serious problems have been apparent as a result. It is noted that the reorganization was directed by general order No. 4 from Headquarters JTF-7, dated 3 June 59. Note that the Task Group ceremonies included two parades, one of which was joined in by the Air Force 4951st squadron.

59

Here, on 11 June, is a message from Sewell to the NTS Planning Board members which gives the conclusions from the 4 June NTS Planning Board meeting which he proposes to send to Reeves in a letter. He wishes to send this letters ahead of the minutes of the meeting due to an urgent requirement of Reeves for some of the information, in particular the approval of the fast criticality facilty. As to the 90-day readiness capability, the group determined that it could be achieved by 1 August making 1 November the earliest date for the resumption of underground NTS testing at a rate of about one per month for each Lab. However, in order to reach this readiness, criteria for construction and DMA approval must be expidited. Immediate approval must be forthcoming on the LASL MOBILE ALPHA Station and approval for construction of 1100 foot vertical holds in Area 3 must come very soon if this site is to be ready to give other than one point safety NP

test capability in that area. The 550W to the one-third containment rule which has been agreed upon is felt to be quite safe and conservative by Sewell. Immediate investigation of the ground water conditions in areas 3 and 12 must take place in order to avoid having to delay certain of those tests, since the depth of some of the proposed shots is planned at the level of the ground water. As for balloon capability, the planning board concluded that the presently planned balloon capability for NTS was adequate to meet the foreseeable needs. As for the fast criticality facility, two types of hydrodynamic experiments were discussed: tests with no nuclear yield involving fissile material; and tests with nuclear yield Sewell stated "for the first type, the board concluded that no safety problemswould result from the Operation as described. Also, for the latter type, the Board concluded that no hazard would result even though certain amounts of activity would be released. It was generally felt that even if an accident inadvertantly did occur it need not create any safety hazard off-site, at Mercury or in adjacent areas. The board did not attempt to evaluate the political problems attendant to such an accident, or the precautions that should be taken to insure complete containment. " The board noted that the LASL and Livermore directors are discussing the possibility of a joint committee to study and perhaps set guidelines for the design and operation of such nuclear experiments. In conclusion, the Board gave approval to the selected site and agreed that, even though some radio activity will be produced, the proposed facility will not create a safety hazard. As for Project OXCART, the board approved two proposed KT shots in area 10. It is felt they could be fired safely with no hazard from fall-out outside the NTS.

An 11 June message from Ogle gives comments to Sewell's statements as follows: He wishes the wording on the ninety day readiness to be changed to say that it can be achieved rather than it will be achieved since the AEC and the Labs have not yet

approved such a program. Further, as for the ground water survey in Area 3, he felt there is agreement that the next four shots could be fired in Area 3 without such a survey and that the urgency is not so great, but that continuous firing in either area should not be contemplated without such a survey.

A 12 June 59 report is from Harold Argo, Secretary of the newly formed "Buzzer" ommittee. He describes this as a committee created by Bradbury and Molnar to study the feasibility of long-range detection of bootleg weapons tests, and in articular to develop in more detail the recommendations of the Panofsky report." he committe Chairman is Taschek, and the Sandia representatives are Shuster, Cook, nd Vaughn. The LASL representatives are Aamodt, Hoerlin, Heller of T-Division, nd ~~T~~ Taschek and Argo. Additional P-Division personnel are listed who will upport various studies. A brief division of responsibility is that LASL will e concerned with techniques and programs of detecting bomb and background radiations hile Sandia will address ancillary problems such as power requirements, logic, elemetry, etc. A tentative outline in some detail of the studies that the committee ill undertake is presented. Taschek suggested that the committee should address orking up to the point of development of a prototype instrument but not attempting o man or operate a world-wide detection system and Sandia agreed. The group was o meet for the second time on 19 June 59.

Final documentation in this folder, in May of 61 indicates that the high ltitude sub-group of the ad hoc group on detection of nuclear detonations has ormed a study group to address the particular area of shielding.

The reports of the 2 sub-committees studying Eniwetok and the "Test When Ready" concept were submitted on 15 and 23 June.

An interesting letter from Bradbury to Commissioner Libby on 15 June 59 comments on some memoranda from Commissioner Graham. After addressing himself to the specific areas of various weapons development and laboratory practices, Bradbury gets into a more general area of the AEC's responsibilities in relation to the nations needs and the DOD's ability to set requirements and understand developments. He notes that the DOD, "or one or another section, can be counted on to respond with enthusiasm to almost any proposal connected with atomic weapons which may be different in some way or another from existed objects, particularly if it might require a whole new weapons system. This willingness to express interest and allege importance is for extraneous reasons no doubt greater at this time than it has been in the past. The likelihood or imminience of success of achieving the prescribed objectives is not a real factor with them; but only the statement by someone with a Ph.d in physics that "it might be possible." This makes me wonder if the AEC should not be careful in the introducing its "gleam-n-the-eye" studies concepts into DOD circles. While very close cooperation between AEC and DOD is essential in design and development phases of weapons, and while the AEC should keep in continual view the full range of military needs as they might

development, a too early identification of a nuclear conceptual possibility with a possible military interest can lead to a too early and too long-range freezing of research programs, or rather, converting a legitimate research program into a dubious development program. Thought this question concerns me, I do not have any useful suggestions to offer." I feel Livermore's attitudes and perhaps optimistic proposals and presentations in some circles may prompt Bradbury to feel this way.

I should mention that there is correspondence through these years having to do with the exchange of information with the United Kingdom through the JOWOG's as set up about the early portion of the moratorium. There is also mention of Stocktake meetings which are just the overall look at the British and US programs as opposed to the more specific areas looked at by the JOWOG's.

A 16 June letter from Lt. Col. Byrne of 4950th to George Cowan notes the lack specific missions for the sampling personnel and aircraft at Indian Springs beyond ie Rover sampling and the possible sampling required for OXCART for Livermore. A imilar letter has been sent to Edward Fleming of Livermore and Byrne needs the plans nd requirements for samplers that could be served by Indian Springs beyond the rojects already named. He notes the current studies addressing the nuclear test apabilities and feels that Indian Springs may be one of the next capabilities ddressed.

JT

Here is a most interesting memo from Ogle to Bradbury on 17 June 59, entitled "Proposal for Future J-Division Activities and Organization," with No. JO-458. After making some basic assumptions about the future activities which include data computation and reduction from past tests; maintenance of diagnostic capability; test planning discussions; and Rover activities; he goes through a group by group breakdown of what the various sections of the divisions will be doing and how this is a change from the past. He describes J-6, J-7, and J-8 as carrying the engineering capability of J-Division. Then he discusses 3 or 4 groups - J-17, J-18, J-19 and J-20 - which will be responsible for tests of specific reactors in the Rover program. He then discusses the background, present activities, and possible future of the technical groups: J-10, J-11, J-12, J-13, J-15, and J-16. One of his thoughts is to possibly combine J-12, J-13, and J-16 under Lee Aamodt to form a new group, "a large portion of whose efforts could be exerted either within the Division or without in directions other than weapons tests or Rover work. . . . The above proposal is made partly as a result of the stated intent of the present J-13 (Malik) and J-16 (Watt) group leaders to leave their present positions." There are so many details in this report that I will extract it for our classified files.

PI

On 17 June, Col. Wignall sent to ARDC Headquarters a copy of the words that the 4950th and 4951st provided to the high level committee investigating a future test organization. The words were requested in regards to the impact of placing the EPG on a minimum maintenance status. The statement is briefly that from the Air Force point of view, the concept of placing Eniwetok on such a status with a capability to resume testing in 12 months is feasible providing one requirement is recognized and that is that the 4951st and its supporting MATS units be returned to their present, pre-phasedown strength immediately after Eniwetok testing is approved. Shortly thereafter, the full complement of augmentation personnel formerly provided by the 4952nd must move to the test site. They make clear that they are not proposing any change in the command control of Air Force units at Eniwetok but that the 4951st should remain an ARDC unit. The phase down to this minimum maintenance status will mean dropping the Air Force personnel strength at Eniwetok from 166 down to between 58 and 73. No aircraft will be based there.

19 Jun 59 - TG 7.1 a message notes Don B. Shuster terminated DT association w/ 7.1 effective 5 June & Graves takes over his role.

Meeting #1521, 19 June 59:

The Chairman reported on the planned establishment of a "scientific panel to evaluate the over-all adequacy of test detection systems." The guidlines for this panels study will be drawn up by a Committee composed of representatives from the DOD, AEC, CIA, the White House, and the State Department. McCone expresseed the AEC's desire to berepresented on both the panel and the committee and proposed Harold Brown and Spofford English as the representatives, with Starbird available for consultation. Starbird stated that the AEC staff believed that Brown should be the representative and English and Starbird should be observers, a proposal with which the Commissioners agreed.

A 22 June 59 letter from Lew Allen then of AFSWP to Jane Hall discusses a possible experiment for Willow based on weapon kill following neutron heating. He sets out briefly some facts which lead him to believe that such a method is feasible and ought to be addressed with a test, as well as the brief details of a preliminary tests. He requests LASL comment and questions whether some coordinated effort might be useful or possible.

A 25 June 59 letter from Senator Anderson, Chairman of the JCAE to Killian quote from and refers to the Berkner panel and report and recommendations and asks that "what action is being taken to comply with these recommendations. In the event additional appropriations by the Congress is required, please inform me as soon as possible in order that no delay may occur." This of course stands behind the recommendations for extensive sismic research.

Note that these folders also contain verbatiums from certain Geneiva meetings as well as the verbatiums articles and treaties proposed and adopted in draft and final form at Geneiva.

Here is the 25 June 59 mid-year review for LASL in which Bradbury begins by noting that the LASL program faces formidable difficulties in view of the continued state of international indecision regarding nuclear testing. Nevertheless, it is neither feasible nor desirable to permit programmatic decisions at the laboratory to drift or to be postponed during this situation. Certain decisions must be made based almost entirely upon human estimates of the probabilities of various outcomes of the current Geneva discussions. . . . At the time of writing this program, it is believed that the probability of resuming any nuclear testing whatsoever must be regarded as roughly equal to the probability that it will continue to be forbidden on either a temporary or permanent basis." Bradbury notes that the laboratory must be careful to make its decisions and conduct its programs such that they can be abruptly modified in either direction as the future course of testing or no testing becomes apparent. Generally along the lines of testing, he feels that it is unlikely that the U.S. will again test in the lower atmosphere under the same circumstances and at the same rates as in the past and that any resumption of testing will be either underground or at some extremely high elevation or in

outerspace. He notes the elevated costs and decreased rate of data gathering in the underground and outerspace regime. Finally, he feels that the "magnitude and rate of specific programmatic weapon developments and corresponding requirements upon the lab may therefore be expected to decrease." His estimates of the gains that can be made in large, medium and small yield weapons with and without testing are the same as in the past.

He makes some general statements about what the lab is doing and plans to do in the event that testing is resumed as follows: "With specific reference to the next 12 to 24 months, we would plan to be able to conduct with minimum but as adequate diagnostic as the subterranean testing technique permits tests beginning in spring 1960, however. we do not plan to devote extensive research to the problem of elaborate physical diagnostics (as differentiated from concern about methods of hydrodynamic or radio chemical yield) until it is clear that such a test series will exist and that such research (or its application) will have a good probability of yielding important and essential diagnostic information. We hope to make extensive use of the capabilities of Sandia with respect to diagnostic and yield observations of shots at missile altitudes in the event that testing of this type is undertaken, and to seek their assistance in preparation of detection and measuring instruments for their package and in the analysis of the data. We also propose to continue to fulfill as long as necessary the requirements of being able to discuss hypothetical test operations practically anywhere on the terrestrial globe or in the accessible universe." Going on to the general situation of how to keep the people at the lab occupied and gainfully employed, he notes that "without testing, there may be a definite drift of the more imaginative and ingenious people away from nuclear weapons work. This is already clear in weapon test activities during the course of the present moratorium. Even before this moratorium there were indications that thoughtful and senior scientific personnel were concerned with both the technical and political future of atomic weapons and

left this field for areas of scientific interests of possibly greater national productivity and certainly more stable future." Bradbury feels that it won't be too difficult to keep the number of people employed doing weapons work but since the most imaginative and ingenious may be moving away, some decrease in the productivity may be expected. As for the overall laboratory employment (roughly 3250 to 3300) he expects and feels that the total lab size should remain constant through this no testing period and gives some indication of how the bulk at the laboratory is broken out in terms of dollars. Of the total 60 million dollar budget, 39 million supports the weapons and much of this is general nuclear research; Rover receives about 13 1/2 million; nuclear reactor work receives about 3 1/2 million; Sherwood receives about 3 million; and radiobiological research gets about 1 million. Bradbury makes clear in his discussion of these various broad programs that the effort in the plasma thermocouple and the Rover and reactor areas will be substantially increased, with a total increase of 15 to 20 million dollars in those areas. After discussing how these several programs would be stepped up with something like 100 people added to those 3 programs, it is made clear that the bulk of this increase will come by decreasing the number of people devoting themselves to the weapons test program and he feels that about 10% of the current level in the testing program can be diverted over the next 12 months with such a diversion starting in about 3 to 6 months if there are no extraordinary changes in the testing or Geneva or weapons scenes. He makes some interesting statements about future testing activities that I think are significant and are quoted here in full:" The problem of weapon test activities and the maintenance of some capability in this area is far from simple, and all of the details have not been worked out. The LASL intends to take a long anticipated step and forego any further responsibilities in the area of test series administration. Although this has probably been a useful task when series were conducted at Eniwetok and above ground in Nevada, it no longer appears to be particularly fruitful in the

framework of underground operations in Nevada or at a missile launch site. We recognize that a resumption of testing (at least with missiles) would require some sort of a task force, and that we might regret somewhat the absence of a Los Alamos role in the scientific administration thereof. At the present time, however, we are inclined to review the probability of such testing, the probability that a suitable administration can be worked out which will give the scientific part of the operation what it needs, and the value of additional housing at Los Alamos as indicating the desirability of such a divorce. A number of the people directly concerned with the technical support of any test operation will continue to be loaned to the Rover operation with the definite intent of keeping this valuable team together and concerned with test site problems and able to deal with them. An additional nucleus of personnel will be kept together as long as they are performing a useful task to participate in discussions of hypothetical test operations and to make sure that arrangements exist and can be reasonably and rapidly bought to action whereby test operation diagnostic can be carried out. Much of these actual diagnostics, however, will not be done by LASL personnel but rather by developing a dual capability in contractors, such as EG&G, to assist in this way in possible future test operations while they are currently occupied with Rover activities. A final group will be kept active for such time as is required to work up the Hardtack results into final form. When this work is completed, perhaps within 6 to 12 months, these individuals will, of course, no longer be required in that activity."

The gross net result of keeping the lab level about constant and making the shifts noted above is a shift in programs sponsored by DMA to program sponsored by the Division of Reactor Development.

25 Jun 59 — General Orders #5
DT discontinue TG 7.1, effective
31 Aug 59.

7.1 It was concurred in by DMA on 18 May. Al Graves relieved Don Shuster of Sandia as head of Task Group 7.1, to perform the residual duties until an appropriate organization is formed for a new operation. The assumption of that responsibility is documented in a message from Al Graves to ALOO on 5 June.

BY

On 25 June 1959, General ~~Betts~~ Starbird sent a very pertinent memo to Hertford, Shutt, Bradbury, Teller, and ~~Hendr~~ Molnar. The subject of it was what we should be doing and seeking funding for relative to maintaining our test capabilities and carrying out preparations at test sites. He stated that overall there is little chance that surface testing at Eniwetok will be resumed within the next year or in the early future thereafter, that there is little possibility of any high altitude or surface operations in alternate areas during this period, but that there is some probability that underground testing will be permitted but it is doubtful that we will get authority to proceed for several months to come. Along these lines, Starboard says he cannot estimate how many months, but he doubts very much that anything definite would be decided until the October 31 date rolls around and perhaps not even then. The AEC testing budget that went from the President to Congress in January carried only 17.5 million dollars for "full scale tests." This was the amount that was felt justified on the basis of cleaning up existing tunnels and placing operations on a maintenance status. Later this budget was revised upward to 27.5 million for FY 60. This upward revision was based on doing certain preparatory work for possible underground testing in Nevada. Starboard states that this has not yet been argued before Congress and there is a very good possibility that congress may cut this number somewhat. However, the 27.5 million figure represented about the maximum that DMA felt they could request without running the danger of having a very substantial cut. Starboard feels the 27.5 million should be used to keep the AEC "relatively well prepared to

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carry out underground testing if that occurs" and to maintain a little flexibility by keeping part of the money uncommitted during the early months of FY 1960 so that if another form of testing becomes possible during that fiscal year, the preparations can be carried out within that figure. As for money savings, Starboard says that putting the EPG on a truely maintenance status but without letting the area deteriorate materially is the first course to take. Even going to a minimum effort at EPG will cost 8 to 9 million dollars of the FY 1960 funds leaving only about 19 million for NTS. Part of this will go to camp and routine support estimated at about .5 million and the largest single drain on the rest of these about 11.5 million dollars will go against tunneling. As to how this money would be used, Starboard states "we now have some 150 men engaged in tunneling and the estimated cost of their activities for the year if this scale were maintained would be about 4 million dollars. Of this four million, approximately 1 million would be actively reimbursable from the DOD in connection with work we would do for them in preparation for the Jericho shot. I intend to maintain a relatively small tunneling crew in Nevada throughout most of the year. I shall ask that the members be dropped to the order of 100 by July 1 and perhaps lower thereafter dependent on the situation that exists after mid-summer. The 100 man crew, incidentally would run us to about 2.7 million dollars. This would mean that we would not start work early in the fiscal year on the new 12G tunnel. We could use our tunnelling potential in extending the other two tunnels and an exploratory work connected with the former firings, but I would hope the latter was held to a minimum." Of other activities that might be carried out in NTS, the more significant include:

a. Complete the Cowboy operation estimated at approximately 1 million dollars.

b. Complete construction of the granite hole estimated at about .8 million dollars.

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c. Complete certain engineering and miscellaneous work largely connected with LASL deep holes and additional Livermore tunneling, estimated at .5 million dollars.

d. Complete a geological and hydrological survey of the area around the LASL deep hole site in area 3 to insure the adequacy of the sight from the stand point of water contamination, estimated costs at .5 million.

e. Complete certain other geological surveys directed toward the feasibility of firing without water contamination difficulties in other areas, estimated at 1 million dollars.

f. Complete LRL safety tunnels already underway and access to the port hole of the new Livermore tunnel, estimated at 1 million dollars.

g. Adding all of these up there is another approximately 4.8 million leaving this amount uncommitted for any special uses, such as firing of the shot in granite, construction of LASL deep holes, initiating new work on the Livermore tunnel, added detection shots, or anything else that may come up in the future.

Starboard states that if possible, he intends to hold these funds in advance until late in the first half of the fiscal year when projects can be ordered as to priority and he can decide which would give us the greatest overall readiness; he solicits the comments of the Laboratories on his feelings and plans for authorization of work.

Requests made by the Navy through the spring of 59 and forwarded to the Chief of Naval personnel on 25 June 59 tried to justify a request for 815 enlisted personnel in FY-60 assigned to Navy Task Group 7.3.

29 Jun. 59 letter from Starbird to York (DDR&E) thru MLC on high altitude effort. Notes joint discussions began in April. Summarizes AEC's studies and interests in this area. Says labs can spare no more than their fairly modest effort as provided at the moment (despite their considerable interest). FN

29 June 1959, J-6 Report: As for Pacific activities it is noted that planning and design for the LCU/LSD system of firing for openseas tests has been firmly selected as the way to go and study of alternate methods by M&N has been cancelled. For NTS, no authorization has been received yet for drilling of the 1100-foot holes in area 3. Investigation of tunnels or deep holes sites in the LRL area 12 has been cancelled. AEC has authorized procurement of 20,000 feet of 1/2 inch coax cable for LASL balloon shots. The draft report concerning the firing of shots underground has been completed by the USGS and indicates the feasibility of firing such shots. BY

parallel with those negotiations mentioned above, the Secretary of the easury by letter of 30 June 1959, requested the Secretary of Defense make Sand Island available to the United States Coast Guard for use a Loran A and C station site. The Secretary of Defense by letter of December 1959 granted permission for the installation of the Loran ation on Sand Island with the provision that it operate on a non-interference sis with the proposed Nike-Zeus program. As the Loran Station satisfied quirements in support of military operations under the operational authority the Commander in Chief, Pacific, authority to shut down was vested in m. On 30 October 1961 the U. S. Coast Guard relinquished its permit occupy a portion of Johnston Island. BB

coral-fill construction program was completed in June 1960 and proximately 25 additional acres were added to the island.

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Several messages in late June and early July of 59 from several agencies to Sewell of Livermore refer to a message #BYX-59-99 dated 26 June which set forth a Livermore description of proposed forthcoming tests at the NTS. It is not clear from the messages in reply what the plans are but each of the agencies from what they can gather can see no significant hazard to their personnel or installations at the NTS as the test have been outlined.

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