

January 1950:

411671

PT

In the area of test planning, "there have been received, and approved with changes the coax, power, signal, and telephone installation drawings for the proposed 1200 foot deep holes in area 3, NTS."

The progress and status of the Sandia cloud sampling development efforts by using ^{drone} ~~drums~~ is reported as follows: "the Sandia air sampling ~~drum~~ development has advanced to a point where the next step will be to test prototypes and compare the information gained with the present knowledge of manned aircraft. The ^{drones} ~~drums~~ themselves (specially modified Beech KDB-1 target ^{drone} ~~drum~~) have been flown at Tonopah and Salton sea by members of Sandia's 5232 group and ^{certain weaknesses} ~~certain~~ ^{weaknesses} found in the production models have been discovered and in most cases remedied. The actual gas sampling and air sampling hardware items are all in the ^{prototype} ~~prototype~~ stage of development and have not been tested under any field conditions. The general feeling among the Sandia personnel associated with this program is that no further work will be done with this overall sampling system unless an atmospheric weapons test program is contemplated. The system and equipment as it now exists will be "shelved" until a definite need arises."

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COMMISSION

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JAN - ~~1960~~ JUNE 60

The following cover the first half of calendar year 1960. In this time period Hutchinson left and Kiley became head of WET on 14 Feb. 1960. I believe Hutchinson at that time became head of JTF-7. Kodis became Director of Test Division on 28 June 1960. PT

General activities included "maintaining a continuing capability for fielding a weapons effects test organization should the test suspension be cancelled and the U.S. resume full-scale nuclear testing. . . . Planning progressed satisfactorily for the standby readiness of Marshmallow, close out of Trumpet, preparation for multi-cubicle tests and preliminary evaluation of Vela Uniform."

Within the test division, manpower authorized was reduced 35% and program offices cut from 9 to 6. "A staff study of 'implication of the test suspension on military effects' was prepared and sent to the Atomic Weapons Training Group. As a

result of this staff study it was concluded by summary that there are a number of militarily significant gaps in our knowledge of weapons effects which will result in ultra-conservative offensive-defensive planning; less flexible military wartime tactics and strategy; an over-designed structures, equipment, weapons, etc. Although theoretical evaluation, laboratory study, and non-nuclear tests will eventually reduce existing gaps in understanding, full-scale nuclear tests are essential to provide our nation with needed data on an efficient, effective, and economically adequate time basis. Specifically, we have need to know for sound military planning." Operation Trumpet was cancelled by DASA due to the suspension of funding to do research in other areas and the Marshmallow program was made the responsibility of Field Command on 1 April, 1960 and given the designation program 800. It is to be brought to a 12 month readiness and kept there and is anticipated that this can be done in Oct. 1960. PT

Personnel authorization dropped from 116 total on the 1st of Jan. to 86 on 30th of June, with actual assigned personnel having dropped from 113 to 97. There is a request pending approval for 12 additional authorized spaces to support Vela Uniform.

Meeting #1579, 6 January 1960:

Note that for some time the roles and relationships of the various AEC laboratories have been under discussion by the Commission and at this this meeting the General Manager presented to the Commission a report prepared for the JCAE on the "Future rolⁱ of Atomic Energy Commission Laboratories". Generally the report seems to deal with the national laboratories but there is an interesting paragraph on Livermore, which is also probably erroneous. "With regard to the future personnel level for the Lawrence Radiation Laboratory, at Livermore, Mr. Graham said that he had understood it was to^{be} held to 600. He noted that the report calls for an expansion to 700 or 800 by 1963 and requested that this matter be investigated further."

NG

d. Joint Task Force SEVEN Albuquerque Office was established on 15 January 1960 to facilitate continuity of planning and coordination for future tests. However, the transfer of NTS logistical support functions from Field Command, DASA to the Task Force was delayed until further guidance could be received on the status of future testing.

FS

Here is a file entitled, "Hot Point," which covers correspondence through the first six months of 1960 on planned ICBM launches of Atlases from Vandenberg to EPG with certain of the tests called Tick Tock.

JT

Willow

Correspondence next jumps to Jan. of 1960 when DASA canceled the equipping of two Redstone missiles with instrumentation pods for test known as W-1 and W-2 which, I believe, were to be done the following fall. This effort was canceled by this TWX which stated, "Recent guidance indicates that it would be unwise to invest additional money in the Willow low altitude program."

CV

— 4950th recommended as permanent TG 7.4 in an on-going JTF-7 in ~~Dec 59~~ Jan 60.

J

Other folders indicate that JTF-7 and its various Task Groups were supporting, using their equipment and facilities, other types of projects such as a Navy Mine Damage Test Program, which were unrelated to test readiness for nuclear testing.

CV

Correspondence in Jan. of 1960 indicates the changes in Army Task Group 7.2 which are taking place due in part to the closeout of EPG. The Army personnel at NTS presently assigned to DASA will be reassigned to JTG 7.2 which will now be headquartered at Arlington. The Group will now be much smaller due to the transfer of personnel with the closeout of Eniwetok. Of interest is some of the details of the transfer of equipment which show that about two dozen LCU's and LCM's which were in JTF-7 possession in the Pacific are now being transferred to various Pacific Islands such as American Samoa and also to the AEC who will remain at Eniwetok in some form. Furthermore, the disposition of various military equipment on loan to the AEC is detailed.

The reply, from Teller to Starbird, came on 5 January 1960, document # BY-590-152, which is discussed in another set of our notes, AM. I will also try to get a copy of this SECRET document for our files.

LR

The initial entry in this folder is a letter from Teller to Starbird dated 5 January 1960 which lays out Livermore's feelings on the guidelines for construction at the NTS to obtain a given readiness as well as the scientific construction costs versus readiness for each proposed facility. It would be most useful to have a copy of this letter which is document # BY-59-152. Teller is responding to a letter from Starbird dated 16 November requesting information on the LRL weapons testing at the Nevada Test Site and on gaining readiness and the scientific construction costs involved. Teller agrees that the highest priority candidates for testing should be the 56 (Fyfe), the 47 mock-ups, the Arrow and the 47 ~~shot~~ shot. He notes the great difference in the diagnostics required for the four tests which leads him to conclude that they cannot be alternates in the same facility and therefore there is a requirement to ready four shot sites, if indeed the four tests are desired to be readied. Teller notes that Starbird had suggested that "If equipment and supplies were assembled to the maximum without incurring additional large new costs, and if basic construction work were completed, we should have the capability of getting off the first shot in 30 to 40 days." Teller notes that one item which must be accomplished in order to reach the proposed readiness is procurement of additional long lead time items especially coaxial cable which will involve large new costs. Furthermore, long lead time procurement will not attain the desired 30 to 40 day readiness unless a certain amount of scientific construction is done immediately. Thus, a combination of long lead time procurement and some scientific construction will achieve a desired 30 to 40 day readiness. Teller further notes that of the four devices, only the 47 safety shot could be done by mid-February and the others might be planned as follows: Fyfe for July, 47 for March, Arrow for July. The ~~scaling~~ ^{scaling} criterion is addressed and Teller makes a recommendation that the scaling rule of $550W^{1/3}$ be modified to $450W^{1/3}$, which he feels is adequately conservative. The message goes on to lay out in tabular form, for the four shots the specifics of facility to be used, maximum yields, the projected construction times, the projected costs for long lead time items and for construction to meet the readiness dates that are finally set forth. Teller recommends the expenditure of about 1 million dollars for long lead time procurement (of almost 400 thousand dollars of coaxial cable and another 600 thousand dollars for scientific construction) to be spent immediately to attain a readiness of 40 days for Fyfe in U12E07 and for the 47 test in U12E03, 21 days for the 47 safety shot in U12J01, and 60 days for Arrow in U12B09. Finally it is noted that the entire test budget for Fiscal 1960 of 4.5 million is already committed with more than half of it committed to Cowboy and Lollipop and Teller recognizes that

AM

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additional funds would have to be made available to achieve the recommended state of readiness. Finally, he concludes that since there has already been a slippage in readiness dates for devices which he considers important to our defense posture, he feels the achievement of the higher degree of readiness is sufficiently important to warrant the expenditures. Note that

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FS

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JFA

On 17 Jan. 1960, Army Task Group 7.2 left EPG and was transferred without personnel or equipment to Arlington Hall Station. In the letter which states this,

on 12 Feb. 60, from Gen. Duncan, now Commander of JTF-7, to Herbert Loper, he also says, "In view of the extremely high cost of maintaining the EPG on a 12 month maintenance standby status, the uncertain future of nuclear testing within the atmosphere and increasing interest in this area shown by other agencies, it is recommended that the requirement for maintaining the EPG at a 12 month maintenance standby status for nuclear testing be re-evaluated at this time."

JH

A 17 January 1960 matter to English from Rutledge, the only committee member who has not previously been associated with any Atomic Energy work, note that he is convinced that the general public is both confused and alarmed about radiation fallout hazards and , from this viewpoint, expresses his opinion about the various projects being brought forth for PLOWSHARE. He notes that he has been attracted to the concept as it has already been explained to the committee by Teller and in particular feels very strongly about the lack of radioactive fallout which this concept is supposed to lead to. He states " for these reasons I am reluctant to endorse Project Chariot as it is now planned, even though the project has reached an advanced stage ^{of} the validity of the arguments in favor of the project by Dr. Teller and others is unquestioned. To my mind, the future of the whole PLOWSHARE program is endangered if Chariot is permitted to go ahead without having a in progress and without being able to tell the public that Chariot is entirely experimental and that it is the last time that conventional atomic bombs will be used for such a purpose. "

ND

References made here on 18 January 1960 to a preliminary development plan for a outerspace weapons test proposal which was prepared by air force ballistic division and forwarded to the AEC which I have taken notes on from other files.

BK

Several TWX's that follow indicate that in fact some of the purchasing is to be done for such things as vacuum pipes and supports, I believe for radiochemistry purposes and that digging is authorized for the U12B09 tunnel. A TWX dated 19 January from the Albuquerque AEC Office to DMA states that the estimate for Teller's scientific construction program from Albuquerque is estimated to be about 2.3 million dollars as opposed to the 625 thousand that Teller had estimated. Overall, ALO estimates a cost of about 3.8 million dollars as a total to meet the proposed readiness dates and it includes the 2.3 million just mentioned as well as a premium to meet the schedule dates, money for expansion of Area 12 Camp and increased operations costs. As for the cable procurement, ALO is proceeding to order the additional coaxial cable to meet the needs of LRL program. A TWX from Sam Howell of H&N to ALO on 19 January gives the estimates for the four locations to meet the LRL schedule. In each case the on-going and already authorized work and its cost as well as the additional costs are listed. These are the costs which were the basis for the ALO TWX to DMA on the same date. Approximately 2 million dollars of tunnel construction for the four tunnels is in progress, an additional 2.3 would be required for what is called additional scientific work, and the grand total of 4.3 million dollars to ready the four tunnels do not include approximately a 20% increase to meet the proposed LRL schedule. Furthermore, there would be some problems in coordinating the activities involved in preparation for Cowboy/Hobo and the Marshmellow program in U12E01. Furthermore, to expand the facilities to handle this effort, approximately 1.4 million dollars would be required.

AM

There is a large amount of correspondence that follows where various schedules are considered that would not meet the May 25 readiness date but which would also not incur the premium cost due to a speeded up schedule and such things as an LRL request for authorization for direct procurement of the coaxial and diagnostic cables through their own channels is granted by ALO.

A 19 Jan. 60 from Starbird to Hertford and the labs discusses the status of possible high altitude tests. In addition to the Willow tests, he notes a 30 Sept. 59 letter from Teller proposes that the AEC labs conduct their own outerspace demonstration of calibration shot at 100,000 kilometers with a Tuba carried on a 3-stage Atlas fired from the EPG. Starbird says a 5 Nov. 59 DASA letter forwarded an ARDC proposal for an outerspace test (prepared by AFBMD) similar "in nearly all respects to Dr. Teller's proposal, and asks AEC to recommend if DOD should proceed with planning and engineering therefore." Starbird sets forth his proposal for cooperating with the DOD by agreeing to provide the warhead and diagnostic packages for the 2 highest Willow tests and encouraging the DOD to proceed with the planning and engineering studies for the outerspace shot as proposed by ARDC. Starbird says that "except for

organizational concept and assignment of responsibilities this will accomplish the purpose of Dr. Teller's proposal." Starbird sees ALOO and Sandia as the principal organizations involved in these efforts and requests the addresses to comment on his plans by 26 Jan. so he can communicate with the DOD.

Ltr (21 Jan 60) from Loper (Ch, MLC) to McCone (Ch, AEC):

Notes President's recent announcement pertaining to test moratorium and says time may be to prepare joint AEC-DOD requirements of weapons for testing and plan for underground series so approval may be obtained to initiate preps requiring funds and effort. Stresses need to plan for underground series.

A

AEC never really answered above until Starbird - Loper ltr in July 60 after "events had made such specific test planning less worthwhile".

A draft reply from Ch, AEC in April (not sent) noted NTS preps for 7 or 8 priority shots and response times ranging from 2 to 18 mos. for other shots mentioned by Loper. (Notes recent events "make it inappropriate at this time to submit specific proposals for early testing.")

Beginning here I will discuss the DASA administrative files from calendar year 60. The first item of interest, dated 22 Jan., I believe I've taken notes on elsewhere. It is a memo for the Chairman of the JCS, DDR&E, and the MLC from James Douglas, Deputy Sec. of Defense on "Nuclear Weapons Development and Weapons Effects Programs." The addressees are requested to view their current study and experimental programs on nuclear weapons effects and apply the following guidance: If realization of useful results depends fully on actual tests underwater or in the atmosphere, these programs should be suspended. If realization of useful results depends on outer space or underground testing, they should be continued for the present in the planning or preparatory stages with attention given to design and testing of instrumentation.

JB

If useful data can be obtained by theoretical, computational, or simulation methods or by low order detonations as defined by the AEC, increased emphasis should be placed on these approaches.

JB

Meeting #1583, 22 January 1960 and Notes of discussions of the Plowshare Program
and Project Oilsand on 12 and 22 January:

AG

The Plowshare program discussions on 12 January included Jim Reeves,
Gerry Johnson and ALOO consultants Beers, Maxey and Newmark.

the Plowshare advisory committee had advised going ahead with Gnome
and, after discussing in great detail with the Commissioners the potential
safety problems with contamination of the aquifer and earthquake problems
and so forth, the ALOO consultants seem to be saying that the probability
of hazards was negligible and therefore recommending approval of the
tests from the hazards standpoint. Another Plowshare project, Oilsand,
a project to recover oil from tar sands in the Athabasca area of Alberta,
Canada, by heating with a nuclear device explosion, was discussed at
some length with Jerry Johnson, Philip Farley and representatives of
Richfield Oil Company present on 22 January. The initial oil sand test
was to use a device whereas Richfield believed that
would provide an economical return. Richfield further commented "That
they believed that the Canadian Government was waiting for the U. S. to
go ahead with the Gnome project before granting approval for the Oilsand
experiment. Mr. McCone said that the U. S. had insisted at the Geneva
negotiations that peaceful uses of nuclear energy be excluded from any
prohibitions on testing, and he believed that this reservation was recognized,
at least in principle, by the Russians and would be included in any agreement
reached at Geneva. The Chairman commented that he thought in a relatively
short time the Geneva negotiations would indicate one way or the other whether
we could proceed with the Gnome project."

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In the 22 January Commission meeting, Plowshare was summarized at some length, with Luedecke summarizing the finding of the ALOO consultants who concluded that the tests could be conducted safely and the details and time scale and funding requirements for the Gnome project were then set forth. Mr. English reviewed the words that the Plowshare Advisory Committee had provided, following their 14-15 January 1960 meeting, with the recommendations: "That each Plowshare detonation be highly instrumented; that the Project Gnome shot be detonated at the earliest date consistent with the International situations; that the Ditchdigger program be initiated as soon as possible in order to demonstrate Ditchdigger principles by the time the Chariot detonations are carried out; and that the bio-environmental survey work for project Chariot be continued at its present level but no further expanded." In further discussions of Chariot, "Mr. McCone thought the plans were getting ahead of reality and referred to a psychological attitude building up in the public against activities which would place additional fission products in the atmosphere. The Chairman said that before the AEC could proceed with Chariot there would be problems with the White House, Congress, State and other Federal Agencies. He thought it would be alright to continue with the ecological survey, but there should be no other shot preparation. Mr. Floberg said he believed the ecological survey alone was worth the money being spent for Chariot." The Commission decision at this meeting were to: Approve proceeding with site preparation and construction for Gnome, which would be made public by a release at the time that the bids went out for site preparations;

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approved proceeding for preparations for bio-environmental survey for Project Chariot during the summer of 1960; approved an HE scaling program; and noted that the Livermore Lab will continue the study in development of the Ditchdigger device and probably undertake preliminary field work for an experiment in late FY 1961. Also it was noted the State Department should be informed of the plans for Gnome and Chariot and their advice sought as to whether to proceed with Ditchdigger.

22 Jan. 60, J-3 Report: Information is that JTF-7 was assigned to DASA on Nov. 59, with Brig. Gen. George Duncan as commander of JTF-7 as of now.

BY

William Hutcheson of Field Command will report to JTF-7 as Chief of Staff on Feb. 60 and relieve Duncan as Commander when Duncan is detached probably not thereafter

Taschek replied to these proposals on 22 Jan. 60 to Bradbury stating that "appropriate arrangements be made on the 2 Willow detonations for coordination with Vela detection capability," and suggesting that the outerspace test be moved to well outside the earth's dipole magnetic field, perhaps 150,000-200,000 kilometers.

LG

1

Livermore's reply from Gerry Johnson, to DMA on 26 Jan.⁶⁰ began by stating that **LG**
the Willow and the outerspace test had to be treated separately since the objectives
of Willow are high altitude effects and weapons test evaluation, whereas the objectives
of the outerspace test are to develop a capability within the AEC's labs for such
testing. He cites Hertford's letter to Starbird on 17 Nov. 59 as representing
Livermore's feelings about the AEC's participation in the Willow test. As for the
outerspace test, Livermore disagrees with the division of responsibility set forth
by Starbird since the development of any testing capability is a responsibility of the
AEC and the military participation would appear in its appropriate place as one of
the support elements.

The LASL reply to Starbird's proposal on 26 Jan.⁶⁰ came from Bradbury and did not **LG**
disagree as strongly with some of Starbird's proposals for communication with the DOD.
Bradbury however said he was pessimistic about the organizational format, urging the
AEC to retain control over fusing and firing, and expressing the feeling that a number
of the details of the technical side of the system and the technical objectives of
the operation would have to be worked out in the future.

Jan. 60 memo (COPB 4518, Rev. I) from E. A. Boyrie discusses cable requirements **CW**
Succotash and shows the expanded concept of the program, which now includes
(and planning for all 3 of i j k tunnels), CHIFFON in U12e.03, BUTLER in U12b.09,
YWHIP in U12e.07, and MARSHMALLOW in U12e.01. 

60

The Sandia reply came on 27 Jan. and, for the Willow tests felt that the Chief LG of DASA should be notified that the AEC would provide a package containing the warheads and associated arming, firing and diagnostic systems with the understanding that the tests would be conducting^y as a joint AEC-DOD test for both weapons effects and diagnostic system calibration purposes. As for the outerspace test, Sandia feels strongly that whereas the DOD would provide and control the launch vehicle and do certain other site selection, planning and preparation, the AEC would have overall test direction and would insure the scientific objectives of the tests were met. Briefly, "a space test of a nuclear device for AEC development of proof test purposes must be planned and conducted with AEC in the saddle if the test is to have any reasonable chance of meeting its objectives. The same statement applies to the calibration or prove-in shots for the AEC diagnostic system."

27 Jan. 60, J-6 Report: The mothballing of EPG (Operation Switch) is essentially complete. The post shot exploratory drilling program in Area 3 at the NTS has been completed, with data evaluation to follow when possible. BY

NOTE: As of this date, as had been increasing for some time, most of the real activity involving LASL people at NTS revolved around the reactor and rocket test facilities. This work was supported by virtually all the groups involving almost all the effort of J-7, J-8, J-12, J-17, J-18, and J-19. As for J-10, a large portion of their work is in data analysis and coding of various weapons problems. J-11 is involved in radio chemical matters. J-13 may have gone out of business at about this time. J-15 is doing calculational work in a number of areas having to do with weapons diagnostics and effects, as well as the physics of stars, and some instrumentation work. J-16 was involved very heavily in instrumentation work and some pure physics. Also, about this time work activity in a particular local area project began to build up.

A 28 January 1960 memo from H & N to AEC in Albuquerque gives the cost estimate for preparing four five hundred foot holes in Area 3 for LASL and the estimates are: \$595,000 for a completion date of 15 June and \$714,000 for a crash program to be completed by 15 May.

NP

A 29 January 1960 Memo by Col. Byrne for the 4950th Commander's Notebook notes that during the previous week definite information from Field Command/DASA was received that Operation TRUMPET is cancelled and that WILLOW will probably also be cancelled. Also noted is that Col. Rose is discussing with PMR the possibility of a live JAGUAR launch on the Pacific Missile Range.

BU

Cross-referenced here of interest is a letter from Walske who was in the U.S. delegation in Geneva to Mr. Gardner at AEC headquarters on 29 Jan. 1960 on the "conference on discontinuance of nuclear weapons test" and this is filed under "201 Walske."

BR

Pick up VH here

The information herein begins in late 1959 and the first item of interest is an early draft of the "Development and Funding Plan for High Altitude Vela," distributed on about 1 Feb. 60 by Taschek. The development program for the satellite packages includes low altitude and deep space probes. The important recommendations are as follows:

NY

1. That R & D satellite launchings begin which, after the 4th successful flight, should have determined a prototype detection system. This will produce the end item about 3 years after program inception.
2. Direct-support flights be flown by Nike-Cajun rockets, deep space probes (609A1), and Aerobee-300 rockets.
3. That the technical control of the project be divided into 3 approximately separable areas of pay load, vehicle, and ground communication.
4. That, as the program progresses, intensive consideration be given to adapting the detection system to the problems of obtaining weapons diagnostics information.
5. The various types of detection capabilities to be attempted and instrumentation equipment, methods, etc. are detailed at some length with some specifics of the development and testing of these methods. Also, there is a listing of proposed rocket firings for payloads to aid in Vela Hotel satellite development. The first series would begin 1 May 60 with Nike-Cajun rockets be fired to about 100 mile altitudes from Fort Churchill (perhaps). Deep space probes would be fired concurrently and beginning shortly thereafter by AFSWC on the 609A-1 rockets from Cape Canaveral, providing altitude capability greater than 30,000 miles. A third capability which may or may not be needed would be the Aerobee-300 rockets which could be launched from Wallops or Eglin to about 300 mile altitudes beginning about 1 Aug. The deep space 609 test could begin on 11 May.

February 1960:

PT

Both J-Division and P-Division report on their accomplishments and status of the development of the packages for the Villa Sierra and Villa Hotel programs respectively. P-Division reports on the second of a series of four flights of their instrumentation aboard Atlas launched from Cape Canaveral on 11 Feb. 1960. This particular flight carried in the pods a two-crystal proton telescope and a gamma-ray Phoswich" counter. The data received was recorded at ground stations at Canaveral, Antigua, and Ascencion Island and looks satisfactory. Also, data reduction is proceeding on the counting rate versus altitude data from the three neutron counter flights from Tonopah.

The next program letter from Teller to Shute on 2 Feb. 1960 opens with some discussion of the main problem which is the lack of testing: no nuclear tests have now taken place for almost a year and a half. Any estimate of the probability of their resumption either this year or next involves considerable uncertainty. Therefore, the lab must make plans to cover the situation both in case of a resumption

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of nuclear tests, and a failure to resume nuclear weapons tests, with or without an agreement on control. In general, the position of the lab is that progress in the development of nuclear weapons, of the varieties which will be described in a later section, can proceed only at a very much slower rate if nuclear weapons tests are not resumed (at least underground) in the near future. Some very important kinds of weapons involving really new ideas cannot be developed at all if no nuclear tests are allowed. However, the lab considers its function to be the most rapid development of nuclear weapons under whatever circumstances may be dictated by national policy." In a lengthy discussion of the weapons development and weaponization programs, it is stated that currently, "Just under 1/2 of the direct effort devoted to the program of nuclear devices and warheads is expended in the weaponization phase. We expect it will be necessary for this percentage to grow to rather more than half by Sept. 1960. (This would be if testing were not resumed.) Hopefully the weaponization effort would then become more efficient and the percentages could be reversed back into a majority in the development of advanced designs.

Under the major heading of test planning and development, Livermore's assumption that a resumption of weapons testing will have tests being only underground and completely contained is noted, with the exception of a later possibility of outerspace tests. "An increasing degree of confidence in underground diagnostic technology has also developed, and a continuing program of theoretical and experimental work will further increase the reliability and capability of our diagnostic techniques. We are continuing the excavation of tunnels at NTS to provide shot sites for yields up to about 30 kt. Preparation of specific shot sites has proceeded up to a point where the next step is scientific construction, particularly installation of diagnostic cables and bunker operating facilities. During the next two years, if such testing resumes, underground sites for testing in the 100-200 kiloton range can be constructed and used."

The lab's Succotash readiness program is presented in some detail with the first shots to be a safety and a proof shot / and tests / to be the highest priority tests to come sometime later. Specific programs in the development of diagnostic instrumentation detectors, techniques, data retrieval systems, etc. are presented.

In the area of outerspace, "a feasibility study has demonstrated that such testing is practical and useful. A proposal for a test to establish the method has been submitted to DMA by LRL. After authorization to proceed, we estimate that in 18 months a test at 100,000^{Km} from the earth's surface could be carried out to calibrate the new techniques required for measuring yield, transit time, and other device properties." It is noted that this program go ahead would require the lab increasing its technical staff to support it.

The following are specific sections discussing programs which allow some progress in weapons technology without being allowed to test: computing machines, code development, flash x-ray and linear accelerators, hydrogen equation of state, and materials development.

Further program discussions address the Plowshare program to which a great deal of space is given, and the program for detection of underground nuclear explosions which includes planning and work underway for the Lollipop test in granite. Also details of the Cowboy program underway are presented.

60 LG

A message from Starbird to Hertford with information to the labs on 3 Feb. notes that he is more or less carrying out the proposal that he had proposed a couple of weeks earlier and indicating AEC agreement to provide warheads and diagnostic packages for the 2 highest Willow shots and recommended the DOD to proceed planning for outerspace experiments along the lines described in the ARDC plan. Starbird notes that Willow planning is going ahead for shots in the fall of 61 with the DOD point of contact being ABMA and that he feels the organizational responsibilities and command and control lines of authority can be worked out later if approval for the tests is granted. As for the outerspace proposal, AFBMD is handling this planning and ALOO is requested to have the labs to proceed with the engineering and development planning for an AEC package to contain the warhead, arming, fusing, firing, safing, diagnostic equipment, and related telemetry and data analysis for such a shot.

Meeting #1590, 4 February 1960:

AG

Further discussion of the Gnome shot and Plowshare gives a summary of the objectives: "(1) To explore the feasibility of concluding nuclear explosive energy into latent heat which would be available for the production of electric power; (2) To investigate the feasibility of recovering from natural salt useful isotopes produced by nuclear explosives; and (3) To extent knowledge about characteristics of an underground explosion in a medium (natural salt) having physical properties in marked contrast to the only medium (volcanic tuff) for which such information is presently available." Also note that the Commission felt at this meeting that it probably would not be possible to conduct a Ditchdigger experiment in the near future, at least where the entire configuration of the tunnel and instrumentation could be open for inspection.

60 LG

Here is a message from Starbird to Hertford, Bradbury, and Molnar on 9 Feb. which notes that there will be a meeting of the "principals" in the next 10 days to decide what detection system and R & D programs will go forward and whose general responsibility they will be. He discusses the several types of test detection systems under consideration and his understanding of the status and responsibilities as well as what is to be determined in the near future for each of the systems. As for as detecting high altitude tests by ground station detectors, the direct optical and fluorescence systems would be part of the first step and he sees LASL as taking responsibility for this entire task. As for test detection by satellite, there is a review underway of the detailed proposal which the "principals" will probably not decide on until late spring. He feels AEC responsibility would be limited to instrumentation development for this particular system. As for seismic detection, AFTAC has asked Sandia to participate with Bell labs in a study by 15 April on the operational feasibility of using unmanned seismic stations to supplement the manned control posts. Following this effort, AFTAC may requests further assistance from Sandia but DMA has made it clear that this must be on a completely reimbursable basis.

On 9 Feb. 60, Agnew sent a document entitled "Test Proposals," No. AW-655 to all members of the FSC (Fission Weapons Committee). This most interesting and lengthy document was drawn up as requested by the director and the proposals for tests and experiments are grouped under three headings: future stockpile; experiments; and non-stockpile applications. The list of specific devices and experiments and some explanations of the objectives following each is submitted to each of these individuals with the expectation that the proposals will be discussed at a future FWC meeting. For information I will list the specific devices and experiments under each of the major headings, perhaps with some specific comments where they are very important;

phenonemology (specifically, neutron and X-ray

PG

effect); calibration shots; seismic decoupling.

Non-stockpile application: Transuranic element production; Orion.'

Agnew and the other authors then conclude "We believe that we should plan for a test series which tests at the rate of about 1 device per month. The following test sequence is submitted with the dates being dependent on starting planning in the immediate future. The proposed tests are grouped in blocks with the idea that any 1 device in a block could be available during that time period." The list then following contains 3 different suggestions for a test for each month beginning in May of 1960 and running monthly thru Jan. of 61.

(Copy in S-DO "Test Proposals" folder)

Following along these lines of setting out the LASL specific devices and experiments which might be done, here are some most interesting draft documents dated 5 Mar. 1960. The numbers are DIR-1554 and 1555 and I have made extracted copies of them for our classified files and nested 54 within 55. They seem to have been originally written by the director and are in response to a 2 Mar. message from Starbird to the labs which indicates that the chairman of the AEC intends to visit each lab to carry on discussions with the senior staff on certain specific problems, particularly the labs' needs and proposals for underground testing as well as weapons programs if no testing is permitted. It is not clear that these pages, here in draft form, ever got anything but internal lab distribution, and the extracts are filed under "Moratorium Readiness" and are extremely useful in understanding the director's feelings about testing and weapons developments and the effect of the moratorium on the laboratory and certain moratorium activities as well as the future of LASL. It is imperative that this document be read in writing about the AEC activities and LASL philosophy and activities in particular in this period of time. Of particular interest is Bradbury's view that the test division is virtually completely tied up in Rover testing at this time and to support weapons testing would be extremely difficult with the present lab

PG

capabilities. His informal list of those underground tests and experiments as well as such other things as orion which LASL would think of doing if they could

Bradbury's statements on the laboratory's momentum and personnel and budgeting within the moratorium as to how this momentum has changed with no testing possible and how he feels it might change in the next few years, is particularly interesting. He is very specific about the kinds of questions and objectives and decisions that he feels should be raised and detailed in order to better define the direction of the laboratory for the immediate future and to better utilize the personnel. Also, his views on the need to maintain specific devices and capabilities in readiness for testing are very significant and his estimates of the difference between maintaining something of a well-defined readiness capability vs. just carrying on the weapons development and keeping people busy. Finally, in the area of seismic detection, he clearly sees very little involvement in this by LASL personnel.

STWX dated 9 February 1960 from Starbird to Hertford, Teller and Bradbury.
Date group is 092031Z Feb. 60. Number is Sierra 65. Starbird notes
Teller's recommendations for an NTS readiness status for the four shots

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discussed above and lists his own beliefs as to the target readiness status which are the 47 safety shot at 21 days beginning on 15 April, the 47 test at 40 days beginning 15 June, the Arrow at 60 days beginning 15 June, and the Fyfe at 40 days beginning 25 July. Starbird authorizes excavation to be accomplished, equipment requiring long lead time to be purchased, installation of diagnostic main cable runs, and other construction necessary to reach the just mentioned readiness dates within the following cost ceiling: no more than 3.3 million dollars is allocated and must be costed within FY 60. As for Starbird's feelings about Teller's recommendations to revise the scaling law to $450W^{1/3}$, Starbird agrees with such change if LRL indeed feels that this will ensure that there is no escape of any significant radioactivity and that it is not satisfactory merely to state that no significant radioactivity will be carried off-site. Starbird notes the current talk about a threshold test ban where shots with a signal lower than 4.75 on the Richter scale would be permitted and he requests LRL to inform him if there are any preparations on-going for shots that would not fit in this category. Starbird addresses possible LASL desires for readiness preparations at NTS. And I quote from this paragraph, "As I discussed with Bradbury last week, the Commission made available some .7 million dollars additional for possible use by LASL. This would be used to advance LASL readiness to fire in the 500 ft holes already excavated at NTS. It is my understanding, Dr. Bradbury will consult shortly with ALO and propose some plan for advanced readiness of LASL essential shots, which should be fired on a relatively short time scale after any clearance to fire was granted. It is also my understanding that this plan may recommend excavation of one or more of the deep holes earlier planned. . . . I wish to have you emphasize that this readiness preparation does not constitute any indication real or implied that a series will be carried out. It is rather an extension of our efforts aimed at a more advanced readiness status. It is desired that no, repeat no, publicity be given to this authorization for added work at NTS. If questions should arise necessitating answer, this should be explained as merely continuation of work to retain site readiness."

11 Feb. 60 memo (COPAC 60-2) from Knapp documents changed Succotash as presently approved by DMA:

U12j.01	Ready Date: 15 Apr. 60
U12e.03	40-day readiness by 15 June
U12b.09	60-day readiness by 15 June
U12e.07	40-day readiness by 25 July

CW

To the extent necessary to meet this schedule, certain construction including excavation, long-lead item purchase, main drift diagnostic cable installation, etc. was authorized. Knapp emphasized these preparations were solely to achieve a more advanced readiness status and were no indication, real or implied, that a test series would be carried out.

Here is the letter from Bradbury to Hertford on 11 February 1960 entitled "NTS Preparations for Possible Resumption of Nuclear Testing" and numbered DIR 1547. The letter, in general, gives the LASL feeling that they would like to attempt to resume weapons testing perhaps 3 or 4 months after a Presidential announcement authorizing such. Bradbury notes that the Lab has a few items in the less than 1 kiloton but a number of items also ranging from 1 to 30 kilotons that the Lab would desire to test. He notes also that the present hole inventory at Nevada is barely suitable for 1 kiloton shots. He feels generally in order to allow tests to be performed within about 3 months after GO, the holes at Nevada must be deepened and perhaps an inventory of a minimum of 1 hole each at about 500, 800, 1100 and 1800 feet would be one possibility. He notes the great conflict in demands for personnel that would ensue should weapons testing begin soon since the same people would be involved in the Rover and the Weapons Test Program and it is not clear whether

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one alternative would win out over another. Bradbury simply asks for ALO's feelings on the LASL concept of this hole development.

A 12 February memo from Hohner of the Las Vegas Branch of ALO to Recco, authorizes the Recco work to begin on the four LRL tunnel sites with the completion dates as given by Starbird in his above message. It is stressed that the costs for the work must not exceed 3.3 million dollars and must be within FY 60 and also that the Area 12 Camp may be expanded with additional temporary construction funds of not more than 510 thousand dollars. A TWX dated 18 February from Allaire of ALO to Kelly of Holmes and Narver is apparently in response to Bradbury's letter and requests and schedules for completing cased holes actively.

CR

1700

13 February

France explodes atomic bomb in Sahara,
becoming fourth atomic power.

CR

A 15 February reply from Reeco to the AEC following their authorization to begin digging work for the four LRL tunnel sites notes that the readiness dates previously discussed were based on a 1 February authorization and since 15 days have passed since then, the only way to meet those schedules is at the cost of an additional 150 thousand dollars for premium work hours. Furthermore, the readiness date for U12E03 of 15 June in the AEC authorization is assumed to be an error based on past discussions and they are assuming that the 15 July readiness date was intended. The 510 thousand dollars allotted for expansion of the Area 12 Camp is noted as being sufficient if arrangements are made between the AEC and the 6th Army for loan from Camp Desert Rock of necessary structures and equipment to construct the additional temporary facilities. Without such loan, the use of "transahomes" will probably reach a total cost of approximately 800 thousand dollars. Further Reeco notes that although they were told to expend the funds within fiscal year 1960, the latest completion date is actually 25 July or fiscal year 1961 and they request clarification.

A 15 February ⁶⁰ letter from Headquarters ARDC to Headquarters Air Force on the subject of maintenance and capability to conduct overseas tests notes among other things that there are six B-57D aircraft modified for high altitude cloud sampling. Of these, one was destroyed in a crash, three are assigned to ADC and the other two are no longer in the active Air Force Inventory; no information is available on the present capability of the three remaining B aircraft to adequately accomplish the high altitude cloud sampling requirement.

BU

Notes in a file entitled, "Pod Recovery Test" indicate that JTF-7 and in particular Task Group 7.3 supported a series of tests off the Florida Coast in Feb. and Mar. of 1960 which evaluated various methods of locating and recovering pods. This would be a rehearsal and a way of testing various configurations for recovering pods which are planned to be ejected from missiles at high altitudes where their impact points may be widely separated on the open sea. This is in relation to the plans for Operation Willow.

CV



DEPARTMENT OF DEFENSE
DEFENSE ATOMIC SUPPORT AGENCY
WASHINGTON 25, D.C.

FV

ADDRESS REPLY TO:
THE CHIEF, DEFENSE ATOMIC
SUPPORT AGENCY

DASACH 320

16 February 1960

SUBJECT: Relationships between Headquarters, DASA and JTF-SEVEN

TO: Commander
Joint Task Force-SEVEN
Arlington Hall Station
Arlington 12, Virginia

1. JCS Staff Memorandum 1209-59, dated 27 November 1959, which assigned JTF-SEVEN as a subordinate command of the DASA, directed me to implement the DOD portion of the recommendations contained in the report of the Study Group on the Organization for Future Test Operations. I feel that it is necessary for me, as well as responsible members of the Headquarters, DASA, staff to remain knowledgeable concerning the planning and operational capabilities of JTF-SEVEN as well as in areas of manpower and budgetary requirements. To this end, all matters concerning proposed changes to programmed expenditures and all matters which may detract from your ability to accomplish the JTF-SEVEN mission will be coordinated with this headquarters.

2. Except for items in above paragraph, you and your staff are authorized the freedom of action necessary in conducting routine day-to-day work and coordination with elements of the Military Departments and other governmental agencies to accomplish your mission and assure a smooth transition of JTF-SEVEN from a non-testing to a testing period. The fact is well recognized within Hq, DASA, that JTF-SEVEN may or may not remain under my operational control during the build-up and operational phases of a test period.

3. The contents of this letter have been brought to the attention of the Hq, DASA, staff.

EDWARD N. PARKER
Rear Admiral, USN
Chief, DASA

An 18 February letter from Schueler of Livermore to ALO documents the fact that LRL is indeed spending money, in this case 521 thousand dollars, to procure their own coaxial cabling.

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A 19 February 60 message from Starbird to the two Lab's Directors list eleven devices for LASL and Livermore with ready dates ranging from July through November and asks the Laboratories to verify that these devices could indeed be ready for testing in those months.

AP

A 19 February memo from Hohner of the Las Vegas Branch to Allaire of ALO is on the subject of Readiness for Weapons Testing and among other things notes that ALO gave verbal permission for Reeco to continue with construction work on Work Orders for safety tunnels U12JK&I on 12 February.

A 22 February TWX from Holmes & Narver to ALO gives the projected costs and completion dates for finishing the casing the four vertical holes as well as completing the surface facilities and hoist installations for the four holes. The digging and casing costs are 0, 100K, 172K and 310K respectively for the 500, 800, 1210 and 1800 foot holes. The schedules are existing, 102 days, 148 days and 237 days, respectively to complete the casing. The surface facilities and hoist installations would cost additional money on the order of 3 million dollars total for the four holes and would require up to about 9 months from authorization.

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The reply from Bradbury to Starbird on 23 February list six devices which LASL estimates can be ready anywhere from May through nine months after a decision to test. Only two of them are the same as two of the five in the list just sent out by Starbird, with the other four being new additions that LASL feels are more likely to be ready in the near future or more desirable for testing. Bradbury discusses the tests at some length, emphasizing the possible problems with having to stay below a statutory limit. He says "in general we are extremely worried about requiring tests to stay under some statutory limit

AP

Thus, any actual test series will have to be reanalysed in terms of the practical limits which face one. If these limits have the same sanctity-or even more-than the one pound criterion with which you are familiar, there is going to be some fairly cold and dripping perspiration at shot time!"

Note that projected budget estimates for FY-61 sent to Headquarters JTF-7 in the spring of 1960 indicate that Task Group 7.3 still requires money for operations in FY 61 and here is a letter dated 24 Feb. 1960 from the Commander of Task Group 7.3 (signed by T.M. Blockwick, acting Chief of Staff) which states, "The primary mission of Task Group 7.3 in support of JTF-7 operations includes the precise positioning of target ships as well as mooring, ship salvage and diving operations. To maintain this and other capabilities required for the successful accomplishment of tasks assigned during overseas atomic tests, it is essential that a continuing training program be pursued. This is particularly important in view of the high degree of readiness required in the minimum length of time which might be expected for a build up and preparation." Other correspondence indicates that a D.M. Tryee may be the Commander and that the Task Group is headquartered in Washington, D.C. The budget is quite modest requesting \$36,500 for FY 1960. JD

Here is a piece of correspondence in the Secretary's files which may not be documented elsewhere and which is important enough to note. It is to the Chairman of the Commission on 24 February 60 from Kistiakowsky NJ who was then the President's Scientific Advisor and it says: "The President has asked me to inform you and Secretary Gates that he considers a vigorous and continuing research and development program on the detection of underground and high altitude explosions to be a matter of high priority and that he hopes the DOD and the AEC will find it possible to finance this program for FY 61 within their existing budgets. I am forwarding a copy of this letter to Secretary Herter. "

Meeting with NASA Representatives, 24 February 1960:

At this Commission meeting, P. Keith Glennan, the Administrator of NASA and several of his staff were in attendance and the Commissioners covered a wide range of items where there was mutual interest and interaction

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between the Commission and the NASA. Among those things discussed were nuclear hazards in space, potential capabilities for measurement of background radiation with satellites, the VELA Project which would address the satellites, Project Rover, etc.

A letter from Hertford to Bradbury on 25 February, as well as a TWX from Hertford to Starbird on 25 February document the ALO plans to meet the LASL requirements for NTS readiness construction. Hertford plans to deepen one of the existing 500 foot holes to 800 feet, start drilling of two holes to a depth of 1200 feet and the depth will be determined by the constraints of funding and completion within this fiscal year, order two hoists suitable for 1800 foot depths, and order long lead time items for the surface facilities. The holes will be cased with the casing for the 1200 foot holes put in, in a temporary way. Hertford requests LASL to furnish ALO with hole criteria and hoist information as early as possible to get the most out of the construction funds and the time available. Furthermore, Hertford tells Bradbury that he will discuss with Starbird the possibility of LASL using a tunnel. In Hertford's

TWX to Bradbury he lays out the plans for LASL construction which I just listed above and notes that all will be done within the .7 million dollars authorized.

AM

25 Feb. 60, J-3 Report: On 13 Feb, Col. Leo A. Kiley relieved Col. Hutcherson at Field Command.

BY

A 25 February message from Teller answered the query from Starbird on the Livermore devices with a list of six devices now being developed as well as five devices just about ready for entry into the stockpile without testing. Of these eleven devices, ten of them could be available for testing by the next September if the go-ahead was given for development and preparation of a tunnel whereas one could be ready by the following April of 61. About half of these are the same as in the list from Starbird.

NP

A 25 February letter from Hertford to Bradbury notes the request that ALOO is going to make to DMA for construction at the NTS in the remainder of the fiscal year for LASL purposes as follows: "deepening one of the existing 500 foot holes in Yucca Flat to 800 feet; start drilling of two holes to a depth of 1200 feet or less ("or less" depending upon the amount of drilling which can be accomplished within the funds of this fiscal year); order two hoists suitable for 1800-foot depth; and order long lead time items for the surface facilities." He asks LASL's specific criteria on these items so that they may pursue them as soon as possible given authorization.

NP

3. Another moratorium project by LRL was the Stardust program which is documented in a letter to Starbird from Gerald Johnson, Associate Director of Livermore, dated 25 February 1960, and numbered COPAA-60-6. Several quotes from the letter will describe the program.

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AS

It has been postulated that the void could become filled with sea water under a certain class of accidents. Chemical experiments have shown that plutonium reacts with water to form a precipitate and that the reaction continues until either the metal or the water is depleted. Hence it is important to establish whether or not an accidentally flooded pit might go critical. We now propose to flood a slightly modified with sea water and to monitor its subsequent behavior. We are calling this proposed experiment Project Stardust. We plan to carry out the Stardust experiment in the Ranger (KAY) bunker at the Nevada Test Site on approximately 1 May 1960. K bunker was chosen for this experiment because it was the most adequate expendable structure in existence at NTS. The maximum expected yield, as stated in Foster's message to you (CA-66-59, 5 October 1959), is fissions. Field construction for this program must be commenced two months prior to the ready date. We, thus, request the authority to carry out this program be granted prior to March 10, 1960."

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~~I wonder if it meant high altitude rather than low altitude.~~ The entire Willow project was canceled by a message from DASA on 26 Feb. 1960 which said that further effort on Operation Willow is to be discontinued.

CV

Other folders indicate that JTF-7 and its various Task Groups were supporting, using their equipment and facilities, other types of projects such as a Navy Mine Damage Test Program, which were unrelated to test readiness for nuclear testing.

CV

IV. The LRL "Technical Directors Operations Plan for Project Hobo", February 26, 1960.

AI

The project which has already been authorized by DMA and is planned for drilling and detonations of HE shots in the U-12E tunnel between 4 March and about 3 April of 1960 is another set of studies to look at the de-coupling effects of various types of explosions in different media with different tamping procedures. The results will be compared with Cowboy, and the signals of Rainier, Blanca and Logan are mentioned as something to be looked at for comparison. The report states "at a depth corresponding more or less to Rainier and Cowboy, two shots of different sizes will be detonated in order to check on the scaling laws. The third shot, at a relatively shallow depth of burial, will test the extent to which the overburden pressure influences the distant seismic signal." The test organization for the shot to be conducted by LRL shows Mr. M. Knapp and Mr. Vey Shelton to be the Technical Director and Alternate, respectively.

Here is a copy of a message from DASA on 26 Feb. 1960 which begins: "Further effort on Operation Willow is to be discontinued." It gives no specific reasons why but just directs the project agencies to close out their projects with the funds on hand in an orderly manner.

LG

Note that some LASL correspondence to DMA after this time clarified the LASL responsibilities in the Vela Sierra program, where EC&G is building the prototype for the fluorescence system and where direct optical system is not really being worked on by LASL.

March 1960:

PT

In the area of Villa Hotel, P-Division reports plans for 27 sensors aboard 16 rockets to be launched in collaboration with Sandia and AFSWC over the next six months from Canaveral, Point Arguello, Wallops Island, Fort Churchill and Tonopha. Specifically, one of these is to carry scintillation x-ray and gamma ray detectors aboard a journeyman B rocket during the latter half of June to investigate simplified versions of instrumentation which could detect nuclear tests at high altitudes.

The section in test evaluation on "consequence of underground explosions" states "an apparent paradox in the latter hold concept is its prediction of seismic wave amplitudes which are even less than those observed from past airbursts. However, when it recognized that the shock wave from a typical air burst has a velocity parallel to the earth which is comparable to the velocity of seismic surface waves, it is clear that considerable energy may be fed into the earth as a result of resonance effects." After briefly describing the method of addressing this paradox, "it is found that the present calculation does predict a surface wave which is larger than that obtained from an underground explosion of the same energy. The resonance effect is clearly exhibited in the results of the analysis."

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Here is a 2 Mar., 1960 transmittal letter from Air Force BSD and specifically Col. Harry Evans, Chairman of the Vela Joint Working Group. The rough draft of this plan is put out by Headquarters ARDC and is entitled "Project Vela Hotel, ARPA Order No. 102-60." The historical section of the report gives the names of the panels who have addressed the question of nuclear test detection and says that the Panofsky panel investigated the detection of nuclear explosions occurring between 50 kilometers and 300,000,000 kilometers from the earth. Furthermore, "On 23 April 59, Dr. Killian, Secretary Quarles, and Mr. McCone met to discuss implementing recommendations of the Panofsky panel. Agreement was reached on the assignment of responsibility for the high altitude detection program. It was decided that the Department of Defense (DOD) would accept overall responsibility for continuing instrumentation development and engineering with the cooperation of the AEC for nuclear detonation aspects, and NASA, for radiation background measurements. The ARPA was subsequently assigned the responsibility for a program involving the investigation of the detection of nuclear detonation underground, at the earth's surface, and in outer space. ARPA Order No. 102-60 directed AFBND to investigate a system of ground stations and satellites for detecting nuclear detonations above 50 kilometers. The study was completed in Oct. 1959. ARPA Order No. 102-60 Amendment 1 directed AFBND to further investigate satellite-based detection system. As a part of this study, ARPA requested that a development plan be generated for a research and development program leading to the definition of a satellite borne detection system. The plan was to be written by a Joint Working Group including members of the AEC, NASA, and ARDC. To facilitate writing the plan separate sub-committees for payload, space booster, and communications and control were ~~performed~~ formed. This development plan for Project Vela Hotel, NY

the space based portion of Project Vela is the result of the efforts of the Joint Working Group and the sub-committee." The plan goes into a great deal of detail on all aspects of the proposed satellite detection systems (drawn from Taschek's earlier draft) as well as communications, launch vehicle development, possible use of various rocket probes for instrumentation and development, and extensive estimates of cost. The overall projected funding would require about 63 million dollars between FY 61 and FY 64. \$36,000,000 of this is ^{designated} ~~designed~~ for launch vehicles whereas \$20,000,000 is designated for satellite payloads.

NY

Meeting #1597, 2 March 1960:

Further discussion of Project Chariot resulted in a decision to continue with the Project and the bio-environmental surveys as authorized earlier. Further, spring of 1962 was approved as the target date for firing which would obviate the need for any construction work in the summer of 1960. Further recommendations were thus requested for the Commission in October of 1960 as whether to proceed with planning for conduct of the experiment in the spring of 1962.

NY

66
A 2 March message from Starbird to Bradbury and Teller concerns the upcoming visit of the AEC chairman to the two Labs to discuss the following with the Senior Staff: each Lab's program in the Weapons Field over the next three years, if testing underground is permitted or if no testing is permitted; the loss of momentum in weapon development if there is no testing permitted; the effect of a detailed Seismic detection development program including nuclear shots on maintaining the momentum of weapons development; the same effects in relation to a PLOWSHARE program being pursued.

NY

Here is a 2 Mar. 1960 status report of JTF-7 which notes that during Jan. and Feb., the commander and division chiefs made a visit to the EPG, J.I. and Task Force liaison offices as well as the AEC operation office in Albuquerque. Furthermore, they prepared and coordinated operations and administrative plans for 3 types of possible operations: high altitude tests at J.I.; openseas tests southeast of Hawaii; and fullscale tests at EPG. Currently, there are 37 officers and 55 enlisted assigned to Headquarters. Task Group 7.2 has been inactivated and 7.3 has been and is currently involved in major projects of interest to both the JTF and the Navy: deep ocean mooring project; anti-submarine warfare programs; coordination of support for conducting DASA-sponsored pod recovery equipment tests in the vicinity of Key West; and a series of mine damage tests which will be conducted by the Task Group from 15 Mar. to 1 May 1960 near Puerto Rico. Plans for Task Group 7.4 are that the 4950th test group will be assigned the additional designation of Task Group 7.4. JTF-7 also opened an Albuquerque office on 15 Jan. 1960 which consists of Major Conrad Peterson and 1 enlisted man with 1 more enlisted man to be added. JR

A 4 March 1960 TWX from Livermore to the LRL Mercury people documents the plans for two XW47 pit assemblies to be sent to the NTS with the first coming from Rocky Flats about 1 April 1960 and the second sometime after 1 June 1960. AS

A 8 March TWX from Newman to Hohner of Las Vegas AEC, requests them to stockpile during FY 60 two groups of 48 reels of unspliced co-axial cable which represents a major fraction of LASL's total cable requirements for the four holes discussed for LASL readiness. AA

A 9 March TWX from Starbird to Hertford authorizes immediate work to be done to meet the LASL readiness requirements at the NTS within the cost ceiling of ~~1.7~~ million dollars and accruing the costs in fiscal year 60. The items include (1) deepen one existing 500 foot hole to 800 feet, (2) knock out the plug at the bottom of the second 500 foot hole and deepen it to approximately 525 feet (3) drill two new holes to 800 and 1200 feet respectively and continue drilling towards these depths as far as time permits before the end of fiscal year 60. (4) purchase a 35 ton capacity wench. (5) engineering for a 50 ton wench should be initiated but procurement deferred. (6) purchase of two diagnostic trailers to be completed in FY 60. (7) procurement of diagnostic cable required by LASL to determine the possibility of obtaining it in this fiscal year. (8) provide surface facilities as mentioned in previous TWX's.

A 10 March memo within the Las Vegas Branch documents a meeting on the LRL program held on 2 March and attended by Holmes & Narver, Reeco, Col. O'Brian of DMA, ALO and LRL where all the specifics of the LRL program as well as a few words about the LASL program were aired. Among other details discussed are the facts that DMA is standing very firm on the need to spend no more than 3.3 million dollars and get it all funded physically within

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fiscal year 1960 with no carry-over into fiscal year 1961. Furthermore, it was noted that DMA had advanced the completion date of the E03 drift from July 15 to June 15 purposely.

Documentation through the month of March showed that the details of the LASL test requirements were made known to ALOO who went out and purchased the necessary cabling, ~~racks~~ hoists, etc., as well as the LRL program being funded as promised and the Reeco work proceeding. A 2 April TWX from Holmes & Narver, to ALOO gives a plan schedule for the four LASL holes in Area 3 which begins with invitation to companies to bid for the drilling on 6 April with bids due during April and notice to proceed coming on the 29th of April. The projected completion times are as follows: Hole AA to be 525 feet deep, completed 3 June; Hole AG 800 feet, 3 June; Hole BB 800 feet, 6 June; Hole BC, 1st 800 feet completed by 28 May and the last 400 feet to be completed by 30 June. Further the TWX notes that there can be one, two or three contractors on the job to assure three rigs of the proper size and capacity.

Here is a 13 March 62 memo R. Preston and Vay Shelton of Livermore on "Technical Concept For A Program of Measurements of Phenomena Involved in Nuclear Explosions in Tunnels." This memo contains a concise summary of Livermore's problems to date in containing tunnel explosions and the various methods tried and a program of measurements in the near future to further their understanding and modify their methods.

pick up VIT here next

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NY

In line with Taschek's feelings, a 14 Mar. meeting of the Vela Hotel Working Group had determined that correction to the development plan might include, among other things, the recommendation to use piggy-back flights for low altitude measurements (ostensibly in contrast to devoted rocket vehicles).

Here is an interesting memo from Gen. George Duncan, Commander of JTF-7, on 17 Mar. 60 to Admiral Parker of DASA on the subject of what the Task Force can do in their present status for the indefinite future. The principle^{al} assumption is that the capability of resuming tests in the atmosphere at EPG within 12 months be retained. Duncan, however, feels that that assumption should be abandoned in light of recent guidance and that the role of the Task Force should be reexamined to have a new pattern of organization and responsibilities substantially altered. Duncan suggests that the EPG should be essentially released from even the caretaker status for future testing after appropriate negotiations with the AEC to drop this requirement, resulting in the dropping by JTF-7 of any support responsibilities for those facilities. Furthermore he believes that the Task Force should be phased down over a period of the next 15 months (by 30 June 61) to a planning staff of DASA. He further suggests that JTF-7, while a staff section of DASA be located at Sandia reporting directly to the Chief of DASA; in this location, the Task Force would be able to work closely with the Field Agencies responsible for developing test requirements. Furthermore he recommends that Task Groups 7.3 and 7.4 be discontinued. Finally he suggests that JTF-7 be given the the responsibility for providing support to the NTS. All of these recommendations, suggestions for change, etc. are part of his proposal which will be one of the proposals considered by a study group to study the future of the Joint Task Force apparently immediately.

CV

V
In a folder entitled, "Briefing Folder" is some pages under the subject of "Suggestions for Planning and Conducting Future Overseas Atomic Tests." Here are documented, from a JTF-7 point of view some of difficulties and deficiencies experienced on Hardtack and suggestions to improve the situation as follows: AFSWP and AEC must be required to keep JTF-7 fully informed as to what projects and events are being considered as they develop.

The Commander of JTF-7 should chair the EPG planning board with strong JTF-7 representation.

The use of Bikini should be discontinued with very large shots being done using the "opensea" concept.

A number of other little details that JTF-7 didn't care for during the Hardtack Operation lead to various recommendations such as "take a hard look at vehicular requirements and cut them drastically. Eliminate the "personal taxi" jeeps." Also, "Task Groups should be forced to cut needless or plush personnel and equipment that is shipped to the EPG." Also, "Do not permit

--
rotation of personnel other than normal while at EPG."

The problem areas are summed up in this document as JTF-7 needing greater control of planning for and conduct of the tests in nearly every aspect; earlier acquisition of money; and earlier determination of the test program. This paper sums up the major weaknesses in the present test concept as "too much testing and not enough analysis of data; too elaborate and expensive a 'modus operandi;' the stopping and starting of testing; and the lack of definite and positive single control of the tests programs.

An 18 Mar. 60 letter from Taschek to a Major Poulson of ARPA discusses the present D & F plan and makes certain remarks on the possible rocket launches for detection system development. Taschek feels strongly that launches of payloads to low altitudes (like 400 kilometers) have very little contribution to the main stream of development for prototype detection satellites which are to operate around 100,000 kilometers. Thus, he suggests that the funding for such low altitude background measurements should not be paid for out of the Vela Hotel budget. Furthermore, he states, "To put it bluntly, it is my belief and generally that of my colleagues all of whom are vitally interested in the successful execution of the Vela Hotel mission and who have therefore examined the background problem very carefully indeed, that a great furor has been made about "background measurements" beyond all natural and obvious relationship to the Vela Hotel mission. Without wishing to detract from the background measurement programs discussed in various meetings, I do believe it is time to de-emphasize them." NY

4. "Report of Study Group On Reappraisal of Requirements For The Eniwetok Proving Ground And The Readiness Status And Functions of JTF-7,"

19 March 1960:

This report was made as a result of a request of Admiral Parker, Starbird, and Gen. Duncan the Commander of JTF-7 by a Joint Memorandum on 19 March 1960 to the following gentlemen: Col. William J. Penly (DASA Army Representative and Chairman of the Group), Captain Charles E. Houston (DMA Representative), Col. Lawrence M. Watson (JTF-7 Representative and BX

Air Force Officer). The request from the Generals stated that in response to a letter from the Deputy Secretary of Defense (Douglas) to the JCS and the Chairman of the MLC on 22 January 1960 on the subject of "Nuclear Weapons Development and Weapons Effects Programs," this group was designated to reappraise the requirements for the EPG and the readiness status and functions of JTF-7. The group's reply was forwarded on 31 March 1960.

Under the facts and assumptions for the group to use in their study are listed the following:

The AEC and the DOD currently maintain the capability to resume nuclear testing at the EPG within 12 months. Both the AEC and JTF-7 have indicated that their capability to respond in this time frame will diminish at an unknown rate with the passing of time. There is a question here as to whether Douglas is the Deputy Secretary of Defense or an Assistant Secretary of Defense.

The following agencies have indicated a desire to use all or part of the EPG facilities on a continuing basis for an indefinite period of time:

PMR, AMC (Air Materiel Command), TAC, and SAC.

In view of the current DOD guidance on testing reflected in Douglas's Memorandum which will continue at least through FY 61, the 12 month capability to test at EPG need no longer be maintained. Testing, if resumed will most probably be underground or possibly in outerspace. Political factors preclude complete U.S. withdrawal from the EPG or complete dissolution

AFSWC History Office

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of the U. S. Nuclear Test Organization. The AEC plans by 1 July 1960 to reduce the contractor personnel at EPG to about 300 people (from 450) and operate at a total annual cost of about \$5M (as opposed to \$8.6M) without significant change to the state of readiness through FY 1961. The DOD guidance on 22 January 1960 stated that maintaining the 12 month capability to resume atmospheric or underwater testing at the EPG is no longer considered justified.

The study group states that there are DOD requirements which are increasing for effects information which can best be obtained by high yield shots in the atmosphere or underwater. Testing of high yield production weapons before stockpiling them is a requirement which can best be fulfilled by testing in the atmosphere at the EPG. Furthermore the Air Force is conducting a study for DASA to determine the best place to launch vehicles for outerspace nuclear testing and one of these bases if the ZI bases are not possible choices would be Johnston Island or EPG. As for discussion of the readiness and functions of JTF-7 in relation to current guidance the group feels that the present state of readiness of JTF-7 is based upon a 12 month response, which under current guidance is no longer justified. The group further states "As the probability of resuming decreases, the state of readiness of JTF-7 should decrease. Current guidance limitations on future testing and the likelihood of placing EPG in caretaker status indicate that a further reduction of JTF-7 readiness is appropriate. It is recognized that there are inherent values in

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AFSWC History Office

retaining, for the time being, the identify of JTF-7 as an organization, even though it may be in a reduced status." The study group addressed four possible alternatives for the future of JTF-7 as follows:

1. Reduce JTF-7 to a planning staff, simultaneously with the phasedown of the EPG, enabling the orderly reduction of JTF-7 Headquarters to a planning staff of approximately 36. It is felt that this alternative would have the least effect on present disarmament negotiations and on international, domestic, and psychological factors.
2. -Reduce JTF-7 to a planning staff without transportation and communications functions which would result in a further savings of about 7 personnel over alternative 1.
3. -Assign the residual JTF-7 functions as a new staff element of about 10 people within DASA Headquarters. This move it is felt would evidence U.S. plans not to be ready for large scale and/or underwater testing. Relative to the alternative of disestablishing JTF-7 it is felt that this offers little, if any, advantage in terms of capabilities.
4. -Disestablish JTF-7, the most economical alternative and transfer residual support functions to existing Federal Agencies and a Joint DOD/AEC Test Planning Board. The group felt that if it is determined that present restrictions on testing would remain in effect for several years, this course of action should be adopted.

The conclusions of the group were as follows:

That the EPG should be reduced to a caretaker status; that JTF-7 Headquarters should be phased down to a planning staff per alternative 1 above; etc.

V
In Mar. of 1960 JTF-7 published a document #S-00012/1 which was entitled "Operation Plan for Johnston Island (Concept 2)." Great emphasis was put on the fact that this was a document for planning guidance only and does not in any way constitute authority for obtaining or committing DOD, JTF-7, or AEC resources, nor does it indicate any particular special knowledge on the possible resumption of nuclear testing. This particular operation plan is addressed only to the conduct by JTF-7 of a series of extremely high altitude nuclear tests from Johnston Island to begin about 18 months following a decision to resume testing.

Here is another plan from about the same period with JTF-7 #S-00012/2.1 and is entitled, "Operation Plan for Opensea Tests (Concept 3)." This plan, once again strictly for planning guidance only, indicates that it is for the expeditious conduct of a series of nuclear tests which are developmental in nature and therefore primarily of interest to the AEC. They will be conducted on the opensea approximately 300 miles south southeast of Hawaii. Among the details are that devices will be placed on barges or landing craft which will be launched from a LSD mother ship and the operation will commence approximately 5 months after the decision to resume atmospheric testing. The base of operation will be afloat during the actual tests.

Here is yet another document in this series with #S-00012/3-1 and is entitled, "Operation Plan for EPG Full Scale (Concept 4)." Again for planning only, this plan sets out how JTF-7 will conduct an extensive series of land, water, surface and underwater nuclear tests of joint DOD and AEC interest at Eniwetok and Bikini atolls. The plan will begin 12 months following the decision to resume large scale atmospheric testing. Bikini would be activated only as a weather, radsafe, and/or instrumentation site.

In a JTF-7 document entitled, "Summary of Test Operations at Eniwetok Proving Ground," and written sometime during the moratorium, there is a summary in brief of each of the test in each of the previous series since 1946 with the devices shot, locations, task force number, etc. and the results of each series. As for Hardtack, certain specific items of high importance and priority which were obtained from these tests are listed as follows:

Variation in the partition of energy from nuclear detonations with altitude;

The effect of nuclear detonations as a function of size and altitude on radio and radar communications, tracking systems, and on missile guidance and control systems;

The effects of nuclear detonation, as a function of size, altitude and design, for anti-ICBM application;

Vulnerability of ICBM warheads to nuclear detonations as a function of size, altitude and design;

The capability of long range detection systems;

Effects of underwater nuclear detonations;

The validity of shaped charge and certain model methods of determining the nuclear weapons effects on submarine and surface targets;

Delivery capabilities of certain Air Force aircraft;

Partition of fallout between worldwide and local deposition;

Very low yield (10 to 20 tons) weapon effects;

Further documentation of such things as crater dimensions as a function of the detonation, neutron flux, nuclear radiation effects on electronic components, EMP, etc.

25 Mar. 60, J-6 Report: As for the EPG, it is stated that operation Switch is essentially complete. H. & N. has reduced their manpower from about 900 last Mar. 25 this Mar. The only scientific construction done during this time period was the Wilma photo tower received new guide wires; certain drawings and designs for other equipment were completed and begun.

As for the NTS, DMA has released money with a time limit on spending it and there has been a small flurry of activity. J-6 has asked for the following to be done: drill and case a 1200 ft. and an 800 ft. 36 in. diameter hole; deepen existing 500 ft. hole to 800 ft.; deepen a 500 ft. hole to 525 ft.; procure a 10 ft. 35 ton winch with hardware for four holes; procure approximately 80,000 ft. of styroflex coax cable; procure a shock resistant mobile alpha trailer and utility trailer; design of an 1800 ft. 50 ton winch and hardware. None of these contracts have been awarded yet, but it is hoped that all will be awarded by mid April.

BY

The test group director's plan for Stardust, No. COPAC60-7, dated 25 March 1960, notes that the purpose of the test is first to determine whether or not the device will go supercritical when flooded with sea water and, if it should, to determine when and how, the total number of fissions, the radiation field and physical violence associated with this type of accident, the subsequent disassembly of the device, and the plutonium alloy equivalent for this system so as to normalize the experimental critical assembly data already taken at Livermore. Readiness date is planned as 4 May 1960. The experiment was performed on 11 May 1960. Results were that the device did not go critical.

AS

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Meeting #1602, 30 March 1960:

Loper and several military representatives of Strategic Air Command attended this meeting which, for the first time that I have seen, discussed the Air Force request for AEC authorization to use EPG as a target area for certain SAC exercises. The EPG had been selected not only for its favorable geographical location for the shots to be launched from Vandenberg but also for its "installed communications and weather facilities. Bikini was considered by SAC as a possible alternate target site but rejected due to its nearness to native populations and its lack of needed equipment." SAC personnel briefed on the operation including the accuracy and specific details of the test events and the possible hazards. In the ensuing Commission discussion, the Commissioners came out strongly in favor of safety measures to protect the contractor personnel and AEC physical facilities at the EPG. One of the Commissioners felt that the statistics were inadequate to guarantee the safety of unconcerned personnel and did not favor exposing them to such risks. Finally, the Commission approved the use of the EPG for this exercise, only if the AEC personnel would be evacuated by the Air Force or provided adequate shelter, the DOD would assume full responsibility for any damage to AEC facilities, and the exercise would be announced as an Air Force project clearly not involving the AEC.

Note that the Commission meetings about this time did not include any substantial discussion of the beginning of French Atomic Testing.

Note that the

revised version of the development plan, published on 30 Mar. 60 indicates that the Journeyman-B and the 609 A rockets are different. Use will be made of the Journeyman, and depending on its success, the 609 A may or may not be used.

NY

- "Joint Development Plan, ARDC/AEC/NASA" 30 March 1960, "Project Vela Hotel Program" (SRD) - in LASL Report Library??
WDLPR-307
ARPA Order 102-60
Good history of VELA^{Hotel} - Taschek was on Joint Working Group.

FL

MORE IN THIS FOLDER!!

e. A 31 March 1960 AEC-DOD RETO Study, "Reappraisal of Requirements for the Eniwetok Proving Ground and the Readiness Status and Functions of JTF-7," was conducted because of negotiations on suspension of nuclear weapons tests and DOD guidance to suspend planning for testing in the atmosphere and underwater. After reviewing the study the JCS, by SM 928-60 dated 23 September 1960, approved the inactivation of JTF-7 with an interim period of operation as a small planning staff element of the DASA and directed the Chief, DASA to determine the date of inactivation.

F

Here is a copy of the JTF document entitled, "Reappraisal of Requirements for the Eniwetok Proving Ground and the Readiness Status and Functions of JTF-7," which was forwarded to JTF-7, DASA, and DMA by a letter on 31 Mar. 1960. The study group that wrote the report was made up of representatives of those three agencies. Notes on this study are included in other of my file notes.

CV

Pick up here next for
VSI.

April 1960:

~~Veta~~

The ~~Veta~~ Hotel section reports on a few more P-Division instrument packages as well as a proposal to fly aboard a Ranger probe launched by an Atlas Agena.

PT

1 Apr. 60, J-10 Report: In the discussion of high altitude energy deposition work being done by Skumanich, he discusses a meeting held at Rand on 22 to 23 Feb. on the subject of nuclear blackouts. He notes that at the meeting a policy statement was made by the DASA representative, W. W. Ennis, to the effect "that DASA was to have "controlling guidance" in nuclear weapons effects research and may supersede ARPA in nuclear weapons effects." Westervelt reported on the first meeting of a joint AEC-Air Force (AFBND) working group on outer space weapons testing which was held on 19 Feb. in Los Angeles. This group is to develop a detailed plan on a testing capability for some appropriate distance outside the earth's influence and deliver this plan with AEC-Air Force approval to DASA on 1 Jul. 60. As for the air fluorescence detection system (ground-based), funding for the EG&G portion of this project has been obtained and target dates are as follows: Approval of the proposed system design on 1 June, prototype ^{system} delivery to LASL on 1 Aug., lightning discrimination tests completed at LASL by 15 Sept., auroral background studies in Oct. and Nov., and system evaluation completed by 15 Jan. 61. prototype of the direct optical system (visible light from the expanding bomb debris) is to follow the fluorescence system by two months.

BY

-7

Correspondence in April of 1960 makes the point that moving the proposed weapons space tests from Cape Canaveral to Johnston Island would cost an additional 30 million dollars but a number of operational and safety considerations could be handled much more easily at Johnston Island. This system was known as ASWT (Advanced System for Weapons Test).

BK

Meeting #1606, 7 April 1960:

For the first time in quite a while, the funding for the weapons program was specifically discussed, with the paper AEC 1019/14 being used as a basis. Generally, the discussion centered around the fact that the recent "semi-annual budget review by the field offices indicated that as a result of various weapons requirements which have occurred since the FY1961 budget was submitted, a supplemental appropriation of 45 million dollars is now needed." The full discussion of the need for the money and the specific amounts discussed is contained in the extract from these minutes which will be obtained for our files. Generally, the Commission agreed in full to the request for additional funding. Note that no mention is made of funds to be expended at the NTS for either

109

Succatash or LASL weapons test readiness preparations which I believe had been approved for that location at about this time by DMA.

Meeting #1609, 12 April 1960:

Here is a discussion of "Exchange of atomic weapon information with the UK," not a new item but of interest here since it focuses in part on the US/UK discussions on sharing any tests for weapons test detection purposes. A copy will be extracted for our files.

NATIONAL AFFAIRS

THE NATION

Toward Disarmament?

During the long, tortuous nuclear-test-ban wrangle between the U.S. and Russia, it often seemed that neither side really expected a test ban, that the wall of suspicion between the two nations was unbreachable. But two weeks ago, the world caught a glint of something that hinted at Russian willingness to negotiate. At the U.S.-British-Soviet test-ban conference in Geneva, Russian Delegate Semyon K. Tsarapkin made what seemed to be a significant concession.

In a departure from Russia's longtime insistence that a nuclear test ban must start with a flat ban on all tests, detectable or not, Tsarapkin agreed to accept the U.S.'s distinction between 1) detectable tests, which the U.S. is willing to ban if an adequate detection system is worked out, and 2) smaller underground tests, which the U.S. is not willing to include in the treaty ban because at present there is no known practical way of detecting them (see box next page). Said Tsarapkin: Russia will agree to a treaty banning only tests above the threshold of detection—provided that the U.S. and Britain agree to a "voluntary" moratorium on subthreshold tests while experts work out better detection techniques.

Through the Haze. At the President's Camp David mountain retreat in Maryland last week, Britain's Prime Minister Harold Macmillan and President Eisenhower discussed the Soviet proposal over the course of two days, agreed on a joint statement accepting a "voluntary moratorium" on below-threshold tests—provided that Russia enter into a treaty banning detectable tests under an adequate inspection system, and agree to a "coordinated research program" for improving detection techniques.

Even before Macmillan's plane left London, the Administration had decided in its own councils to accept Tsarapkin's moratorium proposal in the interest of getting a test-ban treaty that might possibly lead to progress on disarmament. Cutting through the haze of passion that has often obscured the facts on both sides of the test-ban debate, the Administration had arrived at the conclusion that 1) a test-ban treaty would be well worth while if it made possible eventual progress toward controlled disarmament; and 2) Russia would probably not risk trying to cheat an inspected test ban, and—most

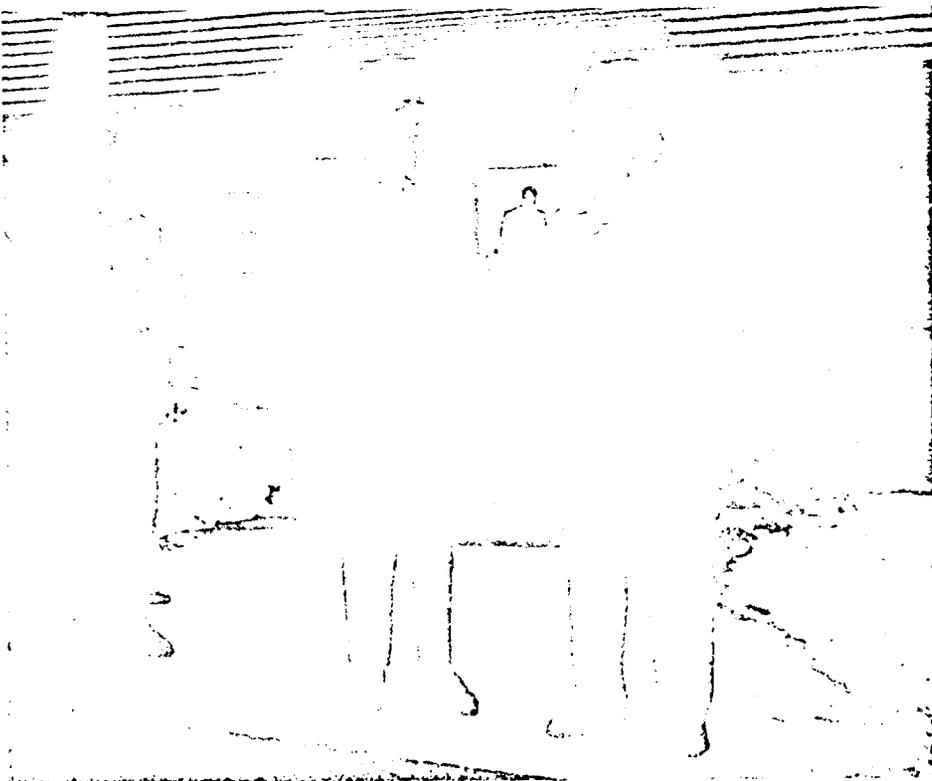
important—could not gain any really decisive advantage even if it did cheat.

In the sessions that hammered out the decision to accept the Soviet moratorium proposal, Air Force Secretary James Douglas, sitting in for traveling Defense Secretary Thomas Gates, made it clear that the Pentagon, to a surprising extent, had come around to a conviction that the chance for an inspection agreement outweighed the risks and costs of a test ban. Central Intelligence Agency Chief Allen Dulles reported that the CIA had no evidence that Russia had ever shown any interest in testing to develop tactical nuclear weapons. Any break in Russia's wall of suspicion and secrecy, he added, would be to the U.S.'s interests. Atomic Energy Commission Chairman John McCone, arguing that the U.S. needs underground tests to develop tactical nuclear weapons, found himself almost alone in the Administration's top councils, and at the end the President ruled against him.

Merely the Beginning. The President's moratorium decision left plenty of obstacles still lying in the way of a safe-

guarded test-ban treaty. For one thing, the Russians may really not want any agreement at all, may be dangling concessions to prolong the talks and thus achieve their original aim of getting the U.S. to halt nuclear tests without any agreement on inspection. On this, the U.S. might get a better reading at the summit in mid-May. But even if President Eisenhower and Premier Khrushchev resolve the basic conflicts on inspection and control measures at the summit, it will still take the test-ban negotiators months to work out the details.

After a treaty is signed, it will take two years or more to set up a functioning detection system. As the U.S. learned after the armistice in Korea, reaching a truce with Communists can be merely the beginning of harassments and frustrations. And even if the detection system is effective, the problem of constant patrol and vigilance is just beginning. Perhaps a greater danger than the risk of undetected underground testing is the risk that the U.S. would be lulled into relaxation by the mere existence of an agreement.



Edward Clark—LIFE

MACMILLAN & EISENHOWER AT CAMP DAVID
Cutting through the haze that has obscured the facts.

A TEST-BAN PRIMER

Who called the Geneva test-ban conference?

On Aug. 22, 1958 President Eisenhower announced the suspension of U.S. nuclear tests as of Oct. 31, 1958, and invited the U.S.S.R. to a test-ban conference in Geneva.

For what reason?

The Eisenhower Administration conceived a test-ban treaty as a possible step toward controlled general disarmament. In 1955-57, when Russian propagandists were clamoring for a ban, President Eisenhower insisted that he would negotiate one only as a part of a larger package, including a halt in production of nuclear materials for weapons purposes, and other steps toward disarmament.

Why is the U.S. now discussing a ban apart from disarmament?

President Eisenhower and Secretary of State Herter hope that a test-ban treaty will be a "first step" toward disarmament. One of the biggest obstacles to any disarmament agreement with Russia is an almost paranoid Soviet wariness toward Western inspection and control proposals. Eisenhower and Herter think that if a test-ban control system could be negotiated with the Russians, it might be a "breakthrough" on disarmament control problems.

When did the U.S. stop nuclear tests?

On Oct. 30, at the end of the Hardtack test series in Nevada. The series included three underground tests of various sizes.

Did the U.S.S.R. also suspend nuclear testing?

Not right away. It carried out a series of tests in the fall of 1958, which scientists agreed were very "dirty"—meaning that they created a lot of radioactive fallout. This was several weeks after the start

of the Geneva Conference. As far as the U.S. knows, the U.S.S.R. has not done any testing since then.

What would the U.S. gain from a test-ban agreement?

The stopping of all above-ground tests by Russia and Britain (as well as the U.S., of course) and perhaps some progress toward making outer space off limits for nuclear shots. President Eisenhower and Secretary Herter also believe that it would be good to get the nuclear rules set up before other nations begin to manufacture nuclear weapons.

Would a nuclear treaty have to be approved by the U.S. Senate?

Yes, by a two-thirds majority.

Would the U.S. lose any of its present bombs by the treaty?

No.

How many bombs does the U.S. have?

The number is classified, but the U.S. does have a widely diversified and dependable "family" of bombs and warheads. These range from small, low-yield, lightweight weapons used by ground and naval forces to the big H-bombs carried by B-52s. Furthermore, there are nuclear devices for antisubmarine warfare, anti-aircraft, air-to-air missiles and intercontinental missiles.

Do the bombs and warheads deteriorate?

No, they need maintenance but they remain lethal.

Is the U.S. supply enough to obliterate Russia?

Many times over.

Would the treaty banning above-surface tests injure development of further big bombs?

It is generally conceded that the U.S. has all the big bombs it needs.

Would the stopping of U.S. underground tests hamper development and refinement of small nuclear devices?

The warheads designed for the Polaris and Minuteman solid-fuel missiles, which the U.S. is depending upon to close the missile gap in the mid-1960s, pack a nuclear punch of about half a megaton, compared with an estimated eight megatons carried by Soviet intercontinental ballistic missiles, and about three or four megatons in the nose cone of the U.S.'s Atlas ICBM. With additional nuclear tests, the yield of the Polaris and Minuteman warheads could be significantly increased, although Admiral William Raborn Jr. has said he needs no further tests of the present Polaris warhead. Some U.S. scientists and military men would like further testing to develop "clean" nuclear weapons with little fallout. The U.S. has developed small warheads, with a yield of less than one kiloton,* for use in tactical weapons, but so far these small warheads are "dirty," and the dirtiness makes it difficult for troops to follow behind the bombardment.

Would a halt in development of tactical nuclear weapons impair U.S. defense?

Some military experts think so, even if the U.S.S.R. did not evade the ban by carrying out clandestine tests. Development of tactical nuclear weapons making it possible for the U.S. to overcome Communist superiority in military manpower without resorting to mass-destruction H-bombs, has long been a hope and goal of U.S. military thinking. Former Atomic Energy Commissioner Thomas E. Murray argues that the only way the U.S. can escape from the "balance of terror" is to shift from reliance on mass-destruction H-bombs to reliance on tactical nuclear weapons. A test ban, he says, would stop development of such tactical nuclear weapons. Many earnest men who might otherwise be willing to go along with a test ban are haunted by the possibility that the U.S.S.R. would find ways to evade the ban and develop nuclear weapons superior to the U.S.'s. To guard against this possibility, the U.S. has insisted from the outset that any nuclear test-ban agreement must include an adequate system of detection and control.

How could clandestine tests be detected?

That depends on the kind of test. A test conducted on the surface of the earth or in the atmosphere is relatively easy to detect: it gives off radiation that can be

* A kiloton is the equivalent in blast of 1,000 tons of TNT. The bomb that wrecked Hiroshima measured about 20 kilotons. In the strange vocabulary of nuclear weapons, a one-kiloton weapon is considered "small." A megaton is 1,000 kilotons, or the equivalent of 1,000,000 tons of TNT.

U.S. HARDTACK TEST SHOT FROM NEVADA TUNNEL (OCT. 1958)

ASSOCIATED PRESS

detected at great distances and in minute quantities. But special difficulties arise with tests in outer space or underground. Testing in outer space is largely a theoretical possibility, but underground testing raises troublesome detection problems here and now. Neither fallout nor radiation escapes, and the only way to detect the test is to use seismographic instruments to pick up the earth tremors. Since there is no sure way to tell from the tremor's "signature" on the seismogram whether it was caused by an earthquake or an underground explosion, inspection teams are needed to make on-the-spot checks of suspicious tremors.

Would a system of seismographs and inspectors be pretty reliable?

The U.S. thought so when it entered in the Geneva conference in October 1948, but learned in the Hardtack underground test series in Nevada in September 1958 that no detection system using known methods could be depended upon to detect explosions of less than 19 kilotons.

If Russia entered into a test-ban agreement, would she be able to carry out clandestine tests?

Yes. Underground tests of much less than 19 kilotons could be carried out with slight risk of detection. And by going to a lot of expense, the U.S.S.R. could carry out tests much bigger than 19 kilotons without much risk. Under the "big-hole" theory worked out by U.S. scientists, an explosion in a very large, spherical underground chamber would be muffled by a factor of as much as 300 to 1, so that a 100-kiloton explosion would set up no stronger a tremor than an unmuffled one-third kiloton explosion, and would thus go entirely undetected. Excavating a big-enough hole half-a-mile underground would be exceedingly costly, but perhaps worthwhile if the the U.S.S.R. very badly wanted to test a nuclear device bigger than 19 kilotons.

Is the Eisenhower Administration worried about the evasion possibilities opened up by the "big-hole" theory?

Worried, but not enough to pull out of the Geneva Conference. The Administration is going ahead, on the theory that no imaginable benefit the U.S.S.R. could gain from a nuclear test would be great enough to justify either a substantial risk of detection (which some think would entail a massive propaganda defeat for the U.S.S.R.) or the great expense of excavating a huge underground chamber (which would involve some risk because it would be difficult to hide the excavation work). More important, the Administration believes that the U.S.S.R. genuinely wants a test ban, partly because Soviet leaders are worried about a problem that also worries U.S. leaders: additional nations, notably Red China, may acquire nuclear weapons. In the Administration's view, Moscow's genuine interest in a test ban greatly reduces the risk that the U.S.S.R. might try to evade it.

Might for Rights

"The country is tired of this bill, and the Senate is tired of this bill," said Republican Leader Everett Dirksen to a colleague as the civil rights debate dragged toward the end of its second month. "All the political juice has been squeezed out of it." In the Senate, that once formidable bastion of Southern filibuster and fury, Majority Leader Lyndon Johnson and Minority Leader Dirksen had decided on a course of power and performance. Moving with sure control, they worked to get roadblocks out of the way of the substantial civil rights bill sent over from the House (TIME, April 4), a bill that notably strengthens Negro voting rights by authorizing federal courts to appoint voting referees. Among the tests met and bested:

¶ Senator Estes Kefauver, long a banner-waving Democratic liberal, but running for re-election this year in segregation-prone Tennessee, suddenly chose to attack the vital voting-rights heart of the bill with a crippling amendment. In the Judiciary Committee, Kefauver proposed an amendment that would change a would-be Negro voter's private hearing before the voting referee into a public hearing open to challenge by local officials. By the time civil rights partisans realized that this would gut the strongest part of the bill, Dixie Senators had rushed Kefauver's amendment through committee on a one-vote margin. (In the confusion, Colorado Democrat John Carroll voted with the Southerners to his subsequent chagrin, and Wisconsin Republican Alex Wiley could not be found to vote at all.) But on the Senate floor the Johnson-Dirksen team rallied their forces, smashed the amendment by a decisive 69-10-22 vote.

¶ Dirksen resolutely reversed his own month-old vote in the drive for unity, voted to make it a federal crime to obstruct any order by a U.S. court—not just an order concerning school integration. Dirksen's switch-over to the broader proposal helped line up a 68-10-20 majority for this amendment.

¶ New York Republican Jacob Javits, wheelhorse for the civil rights team, tried to delay Senate action on his proposal giving permanent, statutory standing to the President's Committee on Government Contracts, now a temporary committee chaired by Vice President Nixon. Republican Dirksen backed Democrat Johnson's move to force Javits to "stop talking and start voting." Red-faced, Javits turned control of his amendment over to Dirksen, who promptly put it up for brief debate, quick defeat by a 48-10-38 vote.

Soon after the North's Javits, like the South's Kefauver, went down to defeat, Senators adjourned to rest their frayed nerves, prepare for this week's drive to finish their long-delayed job of buttressing the voting rights of Negroes. So sure of victory was Majority Leader Johnson that he began practicing on office visitors a triumphant address celebrating the final vote.

Election-Year Casualty

On a 9-10-7 vote, the Senate Foreign Relations Committee last week postponed "to a later time" (translation: to a later session of Congress) any hopeful attempt to repeal the so-called Connally Reservation of 1946, a roadblock to effective U.S. use of the World Court for settling international disputes. Both President Eisenhower and Vice President Nixon had sought the abolition as a step toward world rule of law. Secretary of State Christian Herter and Attorney General William P. Rogers took strong stands in testimony before the committee. The move to repeal was sponsored by Minnesota's Hubert Humphrey, had the support of other key Democrats. More than half the Senate favored abolition.

But the reservation, superimposed on the resolution that commits the U.S. to participation in the World Court, can be abolished only by a treaty-ratifying two-thirds vote of the Senate. Party leaders polled members, found too many up-for-election Senators afraid to stand on a hot issue not yet understood by millions of voters. Rather than suffer a damaging defeat, the Humphrey amendment's supporters decided to mark time.

Pension Winds

Ulysses' ancient Odyssey with a bagful of spirited winds had something in common with the voyage that Arkansas' Wilbur Mills, chairman of the powerful House Ways & Means Committee, embarked on last week. With Mills's hand on the tiller, the House committee killed off by a vote of 17 to 8 (ten Republicans, seven Democrats v. eight Democrats) the Forand bill (TIME, April 4), which would provide old-age medical and surgical benefits to Social Security pensioners at a cost—to be paid for by increased Social Security taxes—estimated to run \$2 billion in the first year and up to \$7.5 billion by 1980.

But the Forand bill, hardy perennial introduced by Rhode Island's Aime Forand, 64, is piling up bagfuls of mail at the Capitol, so much in fact that the Eisenhower Administration is working up a substitute proposal. Conservative Democrat Mills fears the Senate will unleash the old-age medical-aid winds before session's end, is braced to stand against them when a Senate bill comes sailing back to the House for approval.

BUREAUCRACY

Cranberries Redeemed

Just before last Thanksgiving, the Health, Education and Welfare Department caused a panic in the cranberry market by claiming that a weed killer improperly used in some cranberry bogs might cause cancer in humans. The widely publicized alarm left 66% of the '59 crop still on the market. Last week the U.S. swallowed the indignant growers' sauce, promised to pay \$10 million in indemnities for the nation's un-sold, uncontaminated stocks of cranberries.

Here, transmitted by a cover letter from Gen. McCorkle to Gen. Schriever of Systems Command on 12 Apr. 1960, is an AFSWC study entitled, "AFSWC Support of Full Scale Nuclear Tests, Apr. 1960," No. SWC-OS13, 659/2. AFSWC discusses the change in the nuclear test readiness situation since the beginning of the moratorium,

HR

based on such things as the Geneva talks and the U.S. treaty proposals which would ban atmospheric tests but possibly include and allow underground tests and make certain assumptions as to what sort of testing is projected for the future and therefore will require military support. Based on the conclusions they draw and their estimates of the situation and their analysis of the present AFSWC support, McCorkle recommends that AFSWC now be required to continue test readiness planning and support with the 600 odd people presently assigned in various groups and squadrons under AFSWC. Further, it is recommended that the 4950th be relieved of the responsibility for maintaining a readiness to resume air support of nuclear testing within 12 months. Further, it is recommended that that group be relieved of its commitment to continue planning for full scale nuclear test support and also that they simply be deactivated. Other recommendations all work towards divesting AFSWC of direct planning and activities to maintain a test readiness capability, such as the transfer of Eniwetok and Indian Springs.

Meeting #1610, 14 April 1960:

Here, in a discussion on the budget for the weapons/^{test} detection program, the Commissioners expressed concern over the Bureau of Budget policy that funds for this program must come to the AEC from the DOD budget. The concern is that for such an important program, the AEC should have its own funding and shouldn't have to depend on another Federal Agency and also concern that the government is not pursuing this program with enough vigor. The details of this discussion will be extracted for our files.

NG

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Details of the LRL project Hobo are contained in other notes and let me add here that Hobo was a series of high explosive shots done in tuff in the Area 12 tunnel E.03. These shots were necessary for comparison with the project Cowboy shots done in salt to study decoupling as the Hobo shots were to study decoupling. A letter from the Test Director, Mr. Myron Knapp, dated 15 April, 1960 documents the fact that the Hobo series which consisted of four high explosive shots was completed by this date. AS

Logan was the name given to certain activities during 1959 and 1960 which involved reentry, drilling and sampling and study of samples from the Logan event which was done prior to the moratorium. AS

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15 April TWX from Strategic Air Command to Air Force Headquarters addressing the planned ATLAS launches into the Eniwetok lagoon among other places. SAC Headquarters favors transfer of the Eniwetok impact area from the AEC to the DOD as part of the PMR and feels that this is the most logical means of accomplishing the demonstration program for the ATLASSES. BU

4-15 Apr 60: B/Ben. Richard H. Harrison, U.S. Army, made Chief of Staff, DASA, in addition to being Deputy Chief (Army) of DASA. FU

A 21 April 1960 TWX from Starboard to the Laboratories discusses the possible ways for providing devices for an international seismic detection detonation program and puts forth some possible ways of segregating the necessary stock pile and handling it including such possibilities as external inspection by foreign nationals and requests the Laboratories to comment on these plans. A 22 April TWX from Starboard to the Labs continues discussion along these lines, wherein Starboard states in relation to the proposed stock pile, it is not necessary to state that either the weapons are obsolete or that all versions have been previously tested but that he believes we should state that they are standard older-type weapons. There is further discussion as to whether the Mark 6 or Mark 7 is more desirable and that consideration must be taken of containers now being procured by Livermore as well as the plans for such experiments as Lolipop and decoupling experiments to require the device to be lowered to a 36" hole.

BR

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A 22 April message from Starbird to Bradbury, Teller, and Hertford notes that France has available to them on a regular basis the unclassified weapon test reports and abstracts on subjects in Nuclear Science. He asks the Labs if they have any additional unclassified information related to the subject of underground testing which could be made available to France. He doesn't wish the Labs to undertake a task of extracting information and making specific preparations but just to inform them of what might be easily available. AP

The next correspondence of interest in this folder occurs after testing had resumed and documents early discussions with the U.S.G.S. and the AEC organizations on a study for additional possible nuclear test sites in the U.S. Apparently, a major concern is the underground water contamination and so there is a survey underway to identify those places in the Continental United States where this is less of a problem than at the NTS.

Two messages from Starbird to the Labs dated 21 and 22 April 1960 present various assumptions for the internationally monitored underground nuclear tests for seismic research. Starbird asks the Labs to consider the question of how the devices might best be stockpiled, which particular devices might be selected, considerations of yield determination, method of emplacement, etc. and asks the Labs to work together to come up with answers to some of the alternatives. These messages are documented in the notes entitled Test Moritorium, file #BR. In response to some of the questions, Harold Brown of Livermore wrote to Jane Hall of LASL on 25 April giving the Livermore position on certain DMA suggestions and questions as follows: Livermore agrees that the proposed stockpile at Medina, as suggested, will be satisfactory; Livermore will accept LASL's judgment on the accuracy of predicting yields of the MARK VII; Livermore feels that the use of the MARK VII system is much preferable to the MARK VI from an operational viewpoint because of the much smaller diameter; the Livermore design for a container is discussed as having been tested for pressures up to three hundred PSI, which may require redesign for holes deeper than three hundred feet. Such redesign will probably allow procurement within three months.

Here are copies of communications between the Chairman of the AEC and the Secretary of Defense on 22 Apr. from the AEC to the DOD and back on 16 May. The subject is possible caretaker status for the EPG and possible transfer to PMR. Both men agree that the EPG should not be retained as a nuclear test facility except on a caretaker basis and the Secretary of Defense has told PMR to confer with ALOO in the near future to arrange for the transfer to PMR by 1 July 1960 and the possible use of H&N employees to provide certain services after the transfer. Note that the TAC mission in June went on as scheduled.

JA

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A 25 April TWX from Bradbury to Starboard answered a query dated 20 April that listed various possible nuclear energy releases by various titles and requested specific definitions for them in relation to the Geneva treaty being worked on. Bradbury looked at these as being various degrees of possibility and various situations versus violating a treaty that said you couldn't do nuclear weapons tests.

BR

25 Apr. 60; J-3 Report: It is reported that Col. William S. Hutchison relieved Brig. Gen. George Duncan as Comander of JTF-7 on 23 Mar.

BY

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The LASL answer to Starbird from Jane Hall on 26 April, she gives the LASL estimates of the composition of the capsules required to obtain the suggested nominal yields. She states that the confidence in these yield estimates is plus or minus 10% and that the estimate of accuracy of yield determination using radial chemical methods is 15 to 20%.

NX

BR

A 27 April TWX from Lee Hancock of ALOO to Starboard addresses some of the logistical types of problems surrounding the inspection of devices for the seismic detection program and goes into a certain amount of detail on a proposed method of locating and storing such devices in various containers at various places for the inspections.

A message from Lee Hancock of ALOO to Starbird on 27 April addresses various logistical and security type problems surrounding the internationally monitored program. ALOO recommends against stockpiling the units at Medina or any MBS/OSS

NX

location from operational aspects. ALOO suggests storage in arid regions and recommends considering Military Ordinance depots, such as Wingate, New Mexico, Navajo, Arizona, etc. Other details of storage, access, observation, cost, etc. are presented.

Meeting #1614, 28 April 1960:

In these discussions of the procedures for conducting nuclear tests for seismic improvement, Edward Teller was present and the lengthy discussions of the AEC's policy and the possible procedures are extracted in full for our files.

NG

Note that the increasing frequency of and detail of discussions on these subjects in this period of time indicates that the Commission is becoming increasingly involved again in the possibility of a nuclear test ban and the details of detection, inspection, thresholds, etc.

28 Apr. 60, J-6 Report: As for the NTS work, procurement of the following for
with new and old holes in Area 3 has been requested: 16,000 ft. of a certain
of coax cable; 48,000 ft. of another type of coax cable; connectors for various
of cable; hardware to suspend coax cable from hoisting cable. Sam Howell from
N came out at the end of Mar. to review requirements for Area 3 and a thorough
discussion of operations on deep holes was carried on. As for items requested in the
previous months, the following has taken place: The bids for drilling new holes
were opened on 26 Apr. 60; six M-G sets are to be delivered to NTS in May; 81,600 ft.
of a certain type of coax will be delivered by mid July; bids for winches and
associated hardware and cabling are to be opened the first week of May; and a bid for
alpha trailers will open on 9 May with delivery asked for 22 July.

BY

A 28 April 1960 memo for record in JTF-7 discusses the possible transfer of
EPG to the PMR and discussions between the two organizations. Mention is made of
Johnston Island in that it now looks very much like the Army Nike-Zeus project may
back out of Johnston even though they have added 22 acres to the island, among
other things. The reason given is that firing the IRBM from Johnston creates a
hazard to the natives at Kwajalein since the sustainer fragments would land in this
vicinity.

JA

JA

Here is a cross-reference to a message from Starboard to Bradbury dated
29 April which states that the JCAE has asked the AEC to prepare a
bibliography of references concerning the technical problems involved in
monitoring an agreement on banning nuclear tests. LASL is to prepare the
bibliography for monitoring tests in the atmosphere and at high altitude.
The referenced TWX is filed in "334 JCAE."

BR

"Pacific Missile Range Technical Memorandum #PMR-TM-60-7, Johnston Island Geography and Facilities," dated 29 April 1960

BB

This document apparently coincides with plans for using Johnston Island as a test site in relation to the Nike-Zeus launching program. This document reflects the history of JI through a visit by the author in November 1959, in relation to the present development of the Nike-Zeus Program for which JI is becoming the center of interest.

A figure in the document shows very roughly what looks like proposed addition of land on the northern side of the island, parallel to the then northern edge of the island and the installation of three launch pads as part of the proposed facilities to be added on this new section of island. Apparently these launch facilities would have been for the Nike-Zeus. One pertinent section on the previous activity at JI follows: "In July of 1948 the Navy transferred jurisdiction of the Island to the Air Force which in 1949 assigned it to the Pacific Division of the Military Air Transport Service. In April 1955, the Pacific Air Forces' Base Command (6486th Air Base Wing, Hickam Field, Hawaii) assumed control of Johnston and assigned 'housekeeping' duties to the 6488th Air Base Squadron. The 6488th is in present occupation. The April to August 1958 period however, saw command temporary granted to the Commander, JTF-7 for the prosecution of Operation Hardtack.

The recent selection of Johnston for use in the projected Johnston-Kwajalein Nike-Zeus system testing relieves the Air Force of command; the 6488th is scheduled to leave between March and June 1960. At this writing, the Atoll is to be given to the Army which is to lease it to the Navy. The Navy in turn is to provide range support to range users." Further pertinent comments concern the population at JI and note that "the present authorized strength is 88 military (including two officers) and 14 civilians. Present actual population (including tenant organizations) is 164: 6488th Air Base Squadron, 100; 1957th Air and Airways Communications Squadron, 3; 6005th Air Postal Group, 1; US Coast Guard Loran Station, 11; US Weather Bureau, 6; US Army Corps of Engineers, 3; and civilian contractor personnel working for the Army Engineers, 40."

The discussion of facilities constructed at JI notes that the sole relic of Hardtack is a blockhouse near the east of the runway.

Further discussion of the plans for JI notes that JI is now scheduled to serve as the launch facility for the targets for the Nike-Zeus Program and therefore a program of dredging, landfilling and construction and rehabilitation of structures has been instituted. The construction will include the target launch pads and cognate facilities which will require area that is not included in the present configuration of JI and will require the addition of approximately 25 acres of fill to the islands northwest

quadrant for the installation of three launch pads and to the southwest corner for the installation of propellant storage facilities. The dredge and fill operation had already begun and was about 20% complete in November 1959 and was due for completion by March 1960.

BB

Here is a 29 April 1960 message from Bradbury to STARBIRD on the subject of LASL PIGGYBACK experiments on NASA payloads. Apparently, the RANGER A-1 and A-2 payloads to be launched by NASA for JPL in April and June of 61 would be ideal for certain very important LASL measurements on short-term (microsecond) background fluctuations. Unfortunately, JPL has not been anxious to give up the the twenty-five to fifty pounds of their total payload weight of 500 to 700 pounds that would be required. These experiments would be part of Taschek's work on the VELA HOTEL program and ARPA is formally requesting the assistance of NASA and Bradbury asks for either Starbird or Luedecke to coordinate with NASA on the request in order to get Taschek's people on board these payloads. NV

Here is a 29 April 60 message from Starbird to the three laboratories which answers a question about preparation of certain information lists that I have seen in other sets of files. On this date, in response to a request from the JCAE, the AEC wishes to prepare a complete bibliography of references (books, official reports, papers, etc.) concerned with the technical problems involved in monitoring an agreement on test ban. This led to the list prepared by LASL and Sandia in the area of atmospheric and high altitude test detection as well as the list prepared by Livermore on Underground and Underwater test detection. PA

Note that references to various JCAE hearings, discussions, and studies indicate that a search of their files for the pertinent feelings on the Geneva negotiations, test ban treaties, weapons development problems, etc. would be most useful.

A 30 April TWX from Starboard to Teller and Brown with info to Bradbury addresses some discussion going on related to what we could hope to accomplish on what time scales in the way of certain types of weapons development we could test. Starboard seems to have certain pieces of information from Teller but asks for elaboration and he sets up several cases of graduated achievement of the test ban over a period of time and asks what the effect would be on weapons development. Case 1, for instance, would provide that between October 1958 and July of 1960 no shot had been fired over 3KT but there might have been certain firings of this yield and below whereas between now and July of 1962 no undecoupled shot greater than 10KT could be fired and that there could be a few partially decoupled shots up to 50 KT at 3,000 ft. depth. Furthermore, after July of 1962 shots

BR

must be less than 5 KT with all stopping by 1964. Case 2, on the other hand, would include all of case 1 except that a few, perhaps 5 outer space shots, could be conducted between now and 1964. Starboard asks for elaboration of the initial comments by Teller and comments from both LASL and Livermore on this subject.

May 1960:

Vela

PT

Under the ~~Villa~~ Hotel section, it is reported that the D&F plan has been reviewed by ARPA who has had a favorable reaction but further requested an interim detection system that could operate in 18 months rather than 4 years.

"A proposal for such an interim detection system is being prepared at LASL. It is based on the detection of the thermoradiation (x-rays) by a group ^{of scintillation} ~~scintillation~~ detectors operating in coincidence."

More P-Division detector packages and experiments have been carried aloft by an Atlas and a Tonopha rocket.

My impression through these many months since the last test series in looking at the discussions under the heading of "design and development of nuclear systems, general weapons development," is that the areas addressed or at least reported on are fairly routine extensions and refinements of techniques already known.

May 1960:

Under test planning and evaluation, the only two headings are: Alpha measurements and NTS. Under the first it is noted that "EG&G personnel concerned with Alpha measurements visited LASL and the general features of future measurements were discussed. The principal features different from past systems are that in the future most detectors will be collimated, close together, and relatively close to the bomb. Since all photo tubes are expected to be near each other, common timing of all data channels becomes relatively easy. The advantage to be gained is more accurate data with less dependence on oscilloscope reading errors."

PT

0 A 2 May TWX from Brown to Starboard answers the previous TWX's questions and lists in detail the time sequence and corresponding yields for various weapons development to reach such goals as a 6,000 LB., 50 Megaton development, a 2000 LB., 12 Megaton development, etc. After going through extensive discussions of which of the various developments sequences could be done under the two scenarios that Starboard had set forth and therefore what level of weapons could be developed provided these levels could be tested and undetected, Brown states while this is all completely speculative, it is however indicative of some of the kinds of advances that could be made by tests carried out in the next four years (and past two years) clandestinely by the Soviets. Further Brown states "the list is principally concerned with large weapons because those are the kind which might require tests in the range 10 KT and above. The tactical weapons, which we consider would be capable of producing an equal or greater imbalance in nuclear capability, can all be done with tests in the kiloton range, of whose easy concealability there can be no question." All this seems to point to the fact that we are either trying like mad to identify just what we can do in the way of development and still hide it, or more likely, the most speculative guess as just what the Soviets might have been doing and still be able to do under certain test ban agreements.

BR

- 3 May 1960. LASL/Sandia report on "Proposed LASL/Sandia Vela Hotel Experiment for the Ranger A-1 and A-2 Probes"; notes shots scheduled for April and June 1961. *space launches.*

FL

The corresponding reply to all this discussion by Bradbury to Starboard on 4 May 1960 starts out by identifying the discussion as that regarding

Page 10

BR

possible yields as a function of weight which can be achieved by further testing, and Bradbury regrets that in his opinion things are much less optimistic than Teller seems to feel. Further, his belief is that future gains with extensive testing is much less than those forecast by Teller and that he regards the utility of particular tests and low yields as much more limited as Teller seems to feel. Also, "in short, nothing has occurred in the last year and a half to change my own opinion regarding the extent of weapon gains possible with limited testing or even with unlimited testing. I am much less optimistic than Teller on both points and the various documents and committees which have dealt with this problem have generally seemed to me to reach conclusions representing the upper limit of allowable optimism rather than a very low limit as Teller apparently feels."

"Alice in Wonderland" quote on believing impossible things!

A 6 May Memo from Hohner to Allaire of ALO documents the current status of the Reeco Area 12 work which generally seems to be on schedule with a certain amount of the work and the money extending into FY 61.

AM

There is a change in everything documented in a 9 May memo for record written by Mr. Allaire of ALO, subject "Telephone Conversation with MA on May 9 Concerning Test Readiness Detection Program" symbol M:WWA-1872. I will quote from this Memo, "I asked Col. O'Brian when he could expect a formal directive concerning NTS construction. He stated the bird is in Europe right now, but O'Brian expects that we should have something by the end of the week. I informed him, without making any change in contractual commitments, we have instructed Las Vegas Branch to have Reynolds and H&N start "shifting gears" from the present program to the detection program previously discussed--he concurred with this action.

AM

With reference to the contract for the LASL holes which are pending award, we advised we should cancel this bid. After a brief discussion of other ca 3 items directly associated with the LASL holes, we agreed these items could also be cancelled at this time. With reference to the Alpha trailers--after the changed program becomes firm we will check with LASL to see if these trailers are still desired for possible other uses."

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A 10 May TWX from Redman of LASL to Starboard and others contains a number of articles making up the bibliography for the high-altitude test detection problems that was requested by Washington and further Mr. Redman notes that the proceedings of the conference of experts at Geneva (July-August 1958) and the technical working group (June 1959) are the only complete references on detection problems. An 11 May TWX from Sandia, Monar gives a more complete list of references for this bibliography and includes two separate categories: atmospheric and high altitude, and underground and underwater (covered by LRL). As for the June 1959 technical working group it is further elaborated on here as "conference on the discontinuance of nuclear weapon tests -- reports on the technical working group on the detection and identification of high altitude nuclear explosions, dated 7/10/59".

BR

On 11 May 1960 AFSWC approved and forwarded to ARDC a proposed Memorandum of Agreement between Headquarters AFSWC and Commander JTF-7 to establish Task Group 7.4 as a permanent organization. The proposed memo is forwarded for the approval, coordination and signature but by Headquarters ARDC and JTF-7.

BU

11 May 60 TWX from SAC to AEC et al notes upcoming launches into atoll at Eniwetok and planned evacuation of nonessential personnel.
(1st to be 27 June).

FP

A 13 May TWX from ALO to O'Brian of DMA documents the estimated savings based on immediately stopping all weapons program construction: Area 12 FY 1960-1.25 million, FY 1961-350 thousand, Subtotal 1.6 million; Area 3: FY 1960-600 thousand, FY 1961-180 thousand, Subtotal - 780 thousand. The overall total is a savings of 2.38 million dollars. No coax is included in the above savings as ALO will continue with procurement of cable.

AM

As a result of a request by the ad hoc group on detection of nuclear detonations (in a 12 May 60 meeting), a proposal for an alternate satellite detection system was published by LASL and Sandia jointly on 10 June, 1960. The title was "Proposal for Interium Capability in Outer Space, ICOS." The proposed satellite would utilize only proven components and techniques in order to cut the time from inception to early system operation to 18 months as recommended by the ad hoc group. Whereas the system set forth in the Vela Hotel D & F plan was imagined as suitable for a multi-lateral surveillance system and emphasized redundancy, the proposed interium system relaxes the requirement of detection to 1 satellite only, decreases the detection range by an order of magnitude, and provides much less detection redundants and hence less emphasis on what may be termed "identification by a signature." NY

On 13 May in 1960, Carson Mark sent an interesting letter to Hans Bethe, apparantly at the request of Bethe, to bring him up to date on LASL's feelings as to the possible gains in kilotons per pound from further weapons testing. He gives an extensive discussion of the present state of the art and the possibilities for the future and illustrates it with a graph which plots kilotons per pound against pounds for the device. The graph shows four separate plots, the most optomistic (efficient) of which has lately been presented in Washington, apparently, by Edward Teller. Slightly less optomistic is a Livermore projection from November 1959 of what might be hoped for in weapons development by 1970 and significantly less optomistic is a similar projection by Livermore for testing through 1965. Well below all three of these curves is a plot of the so-called State of the Art Development, most of which has not been verified by testing. The designs which have been verified lie even below this state of the art plot but for reasons discussed in some detail by Carson Mark, various points on the "state of the art" curve are felt to be attainable even by LASL. As for Teller's prediction (and I believe he is saying that it could be possible to reach such points within about three years), not only would it require 100% efficiency and therefore it seems totally outlandish to the LASL people, but even Harold Brown of Livermore doesn't seem to accept this curve and thus Mark feels that as far as the AEC is concerned it may be withdrawn and will only "persist in the LA

LA

mind of some ~~particular~~ politicians." The general area of the curve which Foster put forth in November of 59 as being possible by perhaps 1965 is felt to be barely feasible by LASL and Mark regards it as "indicating roughly the present frontier between optimistic science and science fiction." At the beginning of the letter, Mark refers to hearings ~~with the JCAE~~ held with the JCAE a few weeks ago on detection, at which Bethe testified and what Mark has heard about this from Dick Taschek as well as seeing the transcripts. Taschek told Mark "that in many respects he had been shocked and saddened-to the extent of being ashamed for some of his fellow scientists-at the persistent and purposeful coloring or discoloring woven into their ostensibly scientific comments." He felt that Bethe alone presented a straight account.

Several days later, Bradbury sent this graph to Starbird noting that he, like Mark, feels that the 1965 Livermore prediction is a pretty optimistic long-range goal, allowing for free, full scale, above ground testing. He feels of course quite gloomy based on only limited yield, underground testing and emphasizes that even the "state of the art" plot is about as adventuresome as either LRL or LASL is really willing to imagine at this point.

16 May - 60

CR

Four-power Summit conference scheduled to begin in Paris fails as Chairman Khrushchev denounces flights of US U-2 reconnaissance planes over USSR. Says that until US policy changes "the Soviet Government sees no possibility for productive negotiations," but does not withdraw from Geneva test ban talks.

CR

A lengthy message from Starbird to the Labs and Operations offices on 13 May on the Seismic improvement program elicited responses from the various addressees that are documented in another set of notes, BR. Here is the Bradbury reply to Starbird which was not in the other notes, dated 25 May 60. As for LASL's participation in the Seismic program, LASL feels that the best method for determining yield is through a simple measurement of PEAK ALPHA which could be made by Sandia or EG & G. "The LASL strongly recommends that such a measurement be included and openly identified. It is completely uninterpretable without a knowledge of the specific bomb being observed. It actually reveals far less information than do the radial chemical samples. It is LASL opinion that such a measurement could be regarded as an obvious and elementary method of yield determination necessary to the program to avoid ambiguous results in case of weapon malbehavior for some reason. The LASL recommends against attempts to determine yield by radial chemical methods." Also discussed are hydrodynamic methods of yield determination which, at least in principle and in contrast to radial chemistry or Alpha measurements, are completely independent of details of the design of the device. In summary, for the capsules which LASL would provide for such tests, LASL would expect to be the agency primarily responsible for yield determination as well as theoretical estimates ahead of time, with the exceptions of methods which required working with other agencies such as Sandia in a program of hydrodynamic yield determination. Bradbury says that the Lab doesn't expect to have appreciable personnel in the field and could possibly have none.

Unofficial word had been received on 18 May by the 4950th that the EPG would be transferred to PMR from the AEC effective 1 July 1960.

Meeting #69, 16-18 ^{MAY} 1960:

For the first time in quite a while the GAC spent quite a bit of time NH
hearing about the Geneva Test Ban Negotiations, the questions of
detection, the possible seismic research programs, etc., and discussed
these problems and expressed their opinions, which are being extracted
for our files.

BR

Page 11

60 On 16 May R. Herbst of Livermore sent an expanded bibliography of underground detection references of a very extensive nature, about 10 pages, to Starboard.

On 17 May Starboard sent a TWX to Hertford with info to Bradbury and Teller outlining certain instructions and authorizations for the seismic detection program. He states that the devices for this program to be in two or more packages where one package will be handled in accordance with the black box concept and that will be the package containing the device. Furthermore, he states that the devices should be designed to fit into a 36" diameter hole and that the black boxes should be at the storage location by 1 August 1960.

As for specifics of the program he gives in tabular form the number of weapons to be stored for various numbers of shots for each yield range and with specific types of capsules for the Mark 7 warhead. He lists a total of about 25 weapons to be stored for at least 12 separate shots with yields ranging from 100 tons up to 15 KT. Further, he tells Hertford that a DMA representative will be at his office on 23 May to discuss the plans to implement this black box seismic test program and at that time will discuss the details of the planning and engineering as well as the funding for the project.

18 May 60 TWX to AL00, labs, etc., from Starbird on Seismic Improvement

Program. Stresses need for immediate agreement on division of responsibility between AEC and ARPA, and sets out initial AEC program (three 5 kt shots at NTS--1 in granite (UI5a) and 2 in tuff (UI2b). One each in granite and tuff will be nuclear. Notes ARPA advisory committee which is chaired by Richard Latter and includes Conrad Longmire. Starbird says FY 61 funds for AEC program have been requested and are expected to be approved. Says

FP

it appear Succotash activities and expenditures should be stopped immediately except for completion of raw digging of UI2E07 drift and vertical shaft. Says he expects soon to terminate Succotash activity and direct funds to be diverted to initial seismic program.

FP

Asks comment.

An 18 May TWX from Starboard to the Operations Offices and the Laboratories elaborates further on the so called seismic improvement program and asks for the Labs comments and agreements on the division of responsibility between AEC and ARPA for this program as well as a proposed organizational structure for coordinating the program and herein informs the Labs of the elements of work on which the engineering and planning can proceed immediately. The AEC will be responsible for all nuclear shots as well as the 5 KT HE shot in Nevada whereas a large amount of the instrumentation and interpretation of

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diagnostic information will be in the hands of ARPA. Jim Reeves is designated as the AEC manager. ARPA will retain its advisory committee (the ad hoc group for detection of nuclear detonations) on test detection and identification and this committee is chaired by Richard Latter with membership of Frank Press, Kenneth Watson, Allan Donovan, Jack Oliver, Walter Munk, Hugo Bernioff, John Tukey, Roland Herbst, and Conrad Longmeir. Details of ~~the~~ ^{three} 5 KT shots at NTS have already been tentatively determined with the first shot being a nuclear test in area 15 in Granite, the second shot being nuclear in tuff in tunnel U12B and the third being a HE shot in tuff also in tunnel U12B. ^(never fired as noted here) As for the seismic decoupling shots, Starboard states that it is his understanding that the Hockley site has the approval of all concerned. Planning and engineering for three planned scaling shots at Nevada includes a .25KT test in U12eo3, a 1.2KT test in U12eo3, and a 40 to 50 KT test in U12eo7. ^(never fired) As for the readiness program called Succotash, Starboard states " it appears now that Succotash activities and expenditures for NTS construction and procurement should be stopped immediately except for completion of raw digging for the U12eo7 drift and vertical shaft. (If there is any other Succotash effort that may contribute directly to the seismic program, it should be made known to me). I would plan therefore to direct shortly that the necessary action be taken to terminate such activity and that the funds concerned be diverted to cover the initial funds of the seismic improvement program. I request that ALO advise me at the earliest practical time as to the savings that can be accomplished in FY 1960 thereby and the amount required for FY 1960 seismic improvement activities."

In his reply to the message Harold Brown of LRL comments on the proposed seismic improvement activities and in particular discusses the state of

BR

weapons test readiness at NTS as follows. "The Seismic Improvement Program should be carried out at NTS with the least possible interference with our present state of weapons readiness. The proposed ^(never done) program, including the 50 KT in Eo7 and the 1.2 KT in Eo3, wipes out three of the four sites of the readiness program. In addition the HE shot will very probably make the B tunnel unavailable for a period of six months to a year. The result of the seismic program, if carried out, would then be that we would be unable to meet the readiness schedule previously given in TWX #S66, February 9, 1960, Starboard to Teller, et al. In case the international situation were to lead at some future time to a decision to resume underground testing, there would then be a delay in three to six months beyond the 40 to 50 day readiness which we had previously planned. We consider this very undesirable. If the high explosive shot is so important that it must be fired at the first available site to reduce its lead time from 8 months to 6 months, B tunnel can be used. In any case, two possible sites in the E tunnel for the 50 KT and the 1.2 KT shots should be obtained by additional tunneling funded from the seismic improvement program, as would be the case for experiments at locations other than NTS. We would like to point out that delaying the 5 KT high explosive shot by two months in order to build a new tunnel access for it will not delay carrying out the 5 KT nuclear shot in the B tunnel. We will in the near future make up a proposal for additional work to put NTS into the same state of readiness capability which we have previously proposed; the details of such a proposal will obviously have to await firm and final arrangements for the seismic program." Brown further states that he assumes that, because of the devices selected, LASL will be asked to provide the complete device systems including capsule design and black boxes.

The first communication in this folder is dated 18 May 1960 and is a TWX from Starbird to Hertford and Bradbury among others. It seems to mark the beginning of serious planning for the seismic improvement program and directs ALO to proceed as rapidly as possible with the AEC portion of that program as opposed to the Department of Defense activities which come under ARPA. Note that the AEC contractors at the NTS which will obviously be doing the work in preparing for the AEC portion of the program will also be working for ARPA as ARPA feels they can use such contractors. Starbird understands that there is agreement as to the locations for three AEC shots all 5 kt: one nuclear 5 kt shot in granite in Area 15, a 5kt nuclear shot in tuff in tunnel U12b and a 5 kt HE shot in tuff in tunnel U12b. Starbird further states that the Hockley site has the approval of all concerned as satisfactory for the seismic decoupling shots and asks that all review this decision and bring forth any dissent as soon as possible. As for the funding picture and the relationship of this program to Succotash the following is stated: "FY 1961 funds for the accomplishment of the AEC portion of the seismic improvement program have been requested of Congress and there is every evidence that they will be appropriated. It now appears that Succotash activities and expenditures for NTS construction and procurement should be stopped immediately except for completion of raw digging for the U12e07 drift and vertical shaft. (If there is any other Succotash effort that may contribute directly to the seismic program it should be made known to me.) I would plan therefore to direct shortly that the necessary action be taken to terminate such activity and that the funds concerned be diverted to cover the initial funds of the seismic improvement program. I request that ALO advise me at the earliest practical time as to the savings that can be accomplished in FY 1960 thereby and the amount required for FY 1960 seismic improvement activities."

AW

Here is an interesting TWX dated 19 May 1960 from the Army in Washington to many subordinate Army units which quotes guidance as follows: "At the request of the acting Secretary of State, it is requested that no public statements be made concerning Berlin situation or summit at present time, pending high level foreign affairs statement expected Thursday." It goes on to request the Army Commanders not address these subjects during Armed Forces Week speeches and this reflects the tensions surrounding the U-2, test ban negotiations, etc.

JA

Here is a interesting letter from Col. William F. Hutchinson, then
Commander of JTF-7 to Col. Thomas L. Mann on 19 May 1960. It begins by
stating, "Gen. Harrison has notified you of your selection for assignment
as the Commander of JTF-7. I'm sure that you find this somewhat puzzling;
however, be assured that this is a highly desirable assignment upon which
you are to be congratulated." Hutchinson goes on to explain the low
activity level of the Task Force at this time and the changes in the JTF
that are foreseen and that will take place certainly if there is an operation.
The reply came from Col. Mann shortly, who was located in Iran at the time,

CV

he did state that, "I am quite puzzled and am looking forward to the
assignment with anticipation mixed with quite a bit of reservation."

Col. Mann actually took command of JTF-7 on 3 Aug. 1960.

In a 19 May reply, Harold Brown of LRL makes the following points concerning
the impact of the seismic program on the present state of readiness at NTS
"The seismic improvement program should be carried out at NTS with the least
possible interference with our present state of weapons testing readiness.
The proposed program, including the 50 kt in E07 and the 1.2 kt in E03,
wipes out three of the four sites of the readiness program. In addition the
HE shot will very probably make the B tunnel unavailable for a period of six
months to a year. The result of the seismic program, if carried out, would
then be that we would be unable to meet the readiness schedule previously
given in a 9 February 1960 TWX from Starbird to Teller. In case the inter-
national situation were to lead at some future time to a decision to resume
underground testing, there would then be a delay of three to six months
beyond the 40 to 60-day readiness which we had previously planned. We con-
sider this very undesirable. If the high explosive shot is so important
that it must be fired at the first available site to reduce its lead time
from 8 months to 6 months, B tunnel can be used. In any case the two possible

AW

sites in the E tunnel for the 50 kt and the 1.2 kt shots should be obtained
by additional tunneling funded from the seismic improvement program, as
would be the case for experiments at locations other than NTS. We would like
to point out that delaying the 5 kt high explosive shot by 2 months in order
to build a new tunnel access for it will not delay carrying out the five kt
nuclear shot in the B tunnel. We will in the near future make a proposal
for additional work to put NTS into the same state of readiness capability
which we have previously proposed; the details of such proposal will obviously
have to await firm and final arrangements for the seismic program."

K There are a few items that are not in the weekly reports that are worth mention. JK
On 19 May 60, Westervelt sent a paper describing the status of the LASL portion of
the VELA SIERRA system (Atmospheric Fluorescence). He was sending it to Walske through

AEC in Washington with the urgent instructions that it had to be in Geneva before
27 May.

DRAFT AM

A 20 May Memo written by Woodruff, Project Engineer at NTS on the
estimated completion dates of the LRL Area 12 Program documents
information received from Mr. Taylor of Reeco. The U12E03 drift
is completed as far as basic construction and is a month or so short of completion
of scientific construction and a couple months from electrical and cabling
installation. The U12E07 shaft is about a month short of completion
with the other facilities such as the O room and the Rad Chem piping a couple
months short of completion. The U12B09 basic construction is one day short
of completion and about a month short of scientific construction completion.

All of the previous in 1960 certainly clears up the question of what it was
that had LRL feeling that the change-over from readiness construction at
the NTS to Vela Uniform Detection Program type activities had severely cut
back on the progress in the direction of achieving weapons test readiness.
Following the cancellation of work in May the jump in correspondence
to July documents how quickly things were cut off.

The ALO reply in detail to Starboard's proposals came on 21 May from Mr. BR
Hertford and includes extensive details of proposed organizations to handle
the seismic program and make several specific comments in regard to
the weapons readiness program versus the seismic program. For the latter
case several options of funding are given and it is stated that if the
current NTS program is continued as planned there can be .8 million dollar
savings whereas if all weapons readiness effort is terminated immediately
except for the raw digging of 12e07 there can be a 1.6 million dollar
savings. Further, there are savings that can be accrued due to the fact
that certain materials such as Coax which were originally ordered and
scheduled for delivery in connection with the weapons readiness program
can be taken into inventory and used for either program.

AEC ^{ref}ferred to PMR (USN)

J (cont.)

- Further degrading of EPG readiness intimated in 20 May 60 ltr from AFSWC on 1 July 60
- ~~done in late August 60!~~
- Javelin/Journeyman development of hi-altitude diagnostic rockets for NWER during 1959-60

23 May 60, J-10 Report: Westervelt notes that a summary of the status of the fluorescence detection system has been sent to Carl Walske in Geneva with the test and negotiation team.

BY

AFSWC History Office

BV

In response to a request from Headquarters ARDC, on 23 May 1960, the 4950th and 4922nd sent a staff study on the subject of "Replacement Aircraft for The B-57 Sampler." The conclusion was that the McDonnell F-4 H is the most suitable aircraft for replacement with the A3J-1 the second choice and F-101B the third choice.

BV

A meeting was held on 23 May with a representative from DMA at ALO and members from the Laboratories to discuss the authorizations necessary to go ahead and meet the 1 August date for the seismic improvement program as well as other technical items such as methods of yield measurement.

BR

There are a number of pieces of correspondence in late May documenting the funding and authorizations from DMA to meet the deadline date and one particular item that was brought up was a proposed yield measurement by a Peek Alpha system which was suggested by LASL in lieu of the radio chemistry or other measurements that had been suggested. Along these lines Starboard proposed a meeting including the Lab technical personnel as well as people from ARPA, the President's Scientific Advisory Committee (Keeny), the State Department and Baker, etc. One of the main subjects of this meeting would be to discuss the ground rules for the seismic program and technical discussion of the advantages and disadvantages of the various yield determination systems and what information they might give to the Soviets as well as the likelihood of the Soviets accepting the various systems. The meeting was proposed for June 6. In contrast to the LASL proposal to use a Peek Alpha measurement for a yield, Livermore suggests either radio chemistry or shock

time of arrival in a polyethylene block as yield measurement techniques.

Among other items authorized by DMA at this time was the production of required capsules for the seismic program as specified in previous TWXs, procurement of associated hardware and materials with authority limited to \$200,000 in the weapons test budget at ALO, and the fact that DMA is negotiating with DOD to withdraw the necessary weapons from stock pile. The first mention of a "whirlaway" ^{unit} ~~unit~~ is contained in a 2 June TWX from Starboard to Hertford.

On 27 May 1960, the commander of Task Group 7.3 (J.M. Shaffer) sent a memo to the Chief of Naval personnel which noted that the nuclear test planning for FY 1960 and 1961 had undergone some slippage and based on the small likelihood of tests, the current allowance of 16 officers and 124 enlisted in Task Group 7.3 is expected to be satisfactory through 1 Oct. 1961. Any changes in operational requirements for the group will be used to bring about corresponding reductions where ever possible. JH

27 May 60, J-6 Report: On hearing that the AEC intends to release EPG to the PMR on 1 Jul 60, J-6 recommended that certain items such as tower parts, electrical cable, etc. be returned to NTS. As for NTS, the sudden withdrawal of money by Washington has brought to a stop the proposed work in Area 3; thus, the drilling of two new holes and deepening of two others has been canceled, as has the procurement of alpha trailers. Procurement of coax cable and casing for the completed holes as progressed to the point where economically it would be unwise to cancel the orders and so these materials will be stockpiled at NTS. BY

Note that the TWX file continues over into 1960 and early in the year indications from the AEC to CJTF-7 are that TAC plans and operation between 30 May and 17 June which will require extensive support at the EPG. The message was forwarded through the 4951st to the AEC who will have to provide the services at the EPG. From the 4950th references a message which they sent to the 4951st at Eniwetok detailing support that will be required for the upcoming operation supporting TAC and finishes by stating, "We have received info which leads us to believe that the contractor support at Eniwetok will be drastically reduced by 1 July. A drastic reduction in ~~XXXXXXXXXXXXXXXXXXXX~~ contractor services would have an adverse effect on capability to support a large scale deployment through Eniwetok in areas of housing, messing, and AMR base support." Clearly they are speaking of the possible transfer to PMR. JA

Note - in May 1960, efforts of ALO diverted from Succotash to Vela Uniform.

(5) No further correspondence exists concerning the Concerto events before ~~at~~ about May 1960 where new discussion seems to be addressing the possibility of putting the Orchid event between Lollipop which would be done first and Cottontail.

I believe details of planning from this point on are amply covered elsewhere.

Note that the project which was formerly called Concerto, I believe, is called Shade. Note that the documentation points to the fact that the Orchid event was continually postponed through 1960 and into 1961 with various dates set early in '61 until a compatibility and field environmental test for the modified Whirlaway device and associated instrumentation section was performed in April of 1961. The relation of this test to the actual Orchid event or the Shade or Vela Uniform program I have not determined. Clearly there was a direct relationship based on an 11 April '61 memorandum from Schueler which notes that LRL technicians will support the Orchid compatibility test on 13 April '61.

AV

1 → - Ltr, May 60, from HQ USAF stated "Because large scale testing is not contemplated and it appears most unlikely that atmospheric testing will ever be resumed, it is proposed to reduce manpower ~~allocation~~ allocated to ARDC in support of nuc. test operations to a minimum."

J-2

Further noted possible transfer ~~of~~ Indian Springs to TAF, Eniwetok to PACAF and question of future requirement for 4926th.

Significant response from ARDC:

- leave 4950th alone
- relieve ARDC of responsibility at Eniwetok
- xfer JSAFB
- remove mission & responsibility of 4926th from ARDC & xfer to appropriate command.
- note significant reductions in 4950th & subs (elimination of 4952d included) made thru 3rd Quarter - FY '61

In referring to this message from Bradbury, Harold Brown sent a message to Starbird on 31 May 60 in which, among other things, he agreed that LASL would furnish the devices and Sandia would develop and supply the black box. Further, Livermore agrees that the best way to get assurance that a seismic device has not malfunctioned is make an Alpha measurement but "the technical difficulty is that this does not tell the yield within any reasonable factor to someone who does not know the design of the device. The Soviets would then merely be taking our word for the yield, unless one of the other techniques of yield was used as well." This could have obvious detrimental propaganda advantages for the Soviets. Thus, Livermore feels that an additional measurement technique, such as radial chemistry or shock time of arrival in polyethylene block be performed also. The details of how this would be done and in which cases it could best apply are discussed.

Messages between DMA, ALOO and the Labs in the latter half of May 60 indicate that specifics are being laid out for the packages to be used for the seismic detection program and responsibilities are being assigned for procurement, fabrication, storage, etc. A 17 May message from Starbird to ALOO gives some details of the requirements for packaging of the capsules and assembly and shipment. The device must be in two or more packages, utilizing the black box concept and the black boxes including their contents must be at the storage location by 1 August 60. The storage requirements include closed storage up to five years. The reply from Hancock of ALOO on 24 May notes discussions with the Laboratories to try to meet the criteria set forth and estimates of the work involved and the cost. Herein is request for the immediate authorization for production and authority to obligate funds from test underrun for Sandia Corporation procurement, as well as approval to proceed with procurement pending the completion of the Sandia report and authority to withdraw the necessary warheads plus spare sevens from the stockpile. Further correspondence from Starbird to Hertford on 2 June authorizes certain actions such as the withdrawal from stockpile of 34 MARK VII'S and 3 MARK 25'S. The schedule remains the same with all devices at the storage location not later than 1 August and a tentative firing schedule showed the first two shots required on 1 September 1960 and 15 October 1960.

Following review of the minutes of another PAC meeting on 25 -26 May, 1960, one of the members Willard Bascom came out against Chariot, noting that since future ditches would be dug by another method the project would demonstrate very little and recommending abandonment of the project immediately and putting the money into something of greater promise, N1

25 May 60, J-3 Report: On 22 Apr. Duncan Curry visited Leo Kiley, head of the Weapons Effects Tests Group at Field Command. Kiley has recommended that his group be substantially reduced in size in view of the uncertainty of future weapons tests, and in the meantime, they are trying to complete all outstanding technical reports for which they are responsible. 57