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"471.6 Program" Folders

and classified files
These unclassified go all the way back to the beginning of the laboratory and are an interesting source of the milestones in various programs and developments since then. Most of the interesting items herein I have seen in other folders already.

REPOSITORY DOE History Division
COLLECTION #1337 Conrad-046
BOX No. #2
FOLDER #3

An 11 July 58 memo from Bradbury to 7 of the key scientists at LASL notes that Starbird is projecting about 18 tests for NTS in 59 and is afraid that Livermore (Teller) will automatically divide this number by 2 and conclude that the number (9) for them is too small. While Bradbury didn't say so to Starbird, he feels that 9 is probably too large for LASL and is asking the general question "Do we keep up with the Joneses"? In questioning just what items ~~might have that~~ might be important and interesting to test, he mentions one that he would like to see wait for the next Eniwetok operation and interestingly indicates by a question mark whether there will ever be a next Eniwetok operation.

A 15 Dec. 58 message from Bradbury and Teller to Starbird indicates that the senior staffs of Livermore and LASL met on 15 Dec. and agreed jointly to certain modifications in weapon assignments and programs at the laboratories.

A 20 Mar. 59 memo from Agnew to MacDougall indicates that Agnew feels LASL needs specific devices to put their effort into for specific objectives by ~~a certain time in order to make the most of their talents~~ and to really answer the hard questions. He suggests a tentative list of 12 devices to be considered by the FWC for those things which the lab might devote themselves to and further

feels that a date such as 31 Oct. 59 should be set by which to have each of the specific device objectives in hand. He notes his reasons behind suggesting certain of the devices and the status at the present time of almost all of the designs which are in one stage or another of completion. He states "the suggestions included herein are certainly not sacred nor are the time scales but I have the feeling that if we don't sit don't and plan out some definite program, nothing will happen. . . . It should be realized that it is only by endeavoring to complete a test device in detail that most of the hairy and crucial questions ever arise and are investigated." Also of interest are Froman's comments on the cover sheet and in the margins of this Agnew memo. Froman agrees with only about 1/3 of the 12 suggestions for development and feels that even developing those will not change the countries defense posture much. Also he doesn't see the sense in taking them through the hardware stage but feels that simply drawings would be enough and just generally feels that there are too many suggestions to close together and that it is just making work for people who apparently might be better employed doing other things.

Some replies from the weapons labs and operations offices to a question or set of questions from Starbird in about June 59 seem to indicate that DMA and perhaps people higher than them want an explanation as to why systems and devices are more and more costly all the time and the weapons developments seem to take longer and longer. The general tone of the replies is that one of the most common developments being made in weapons is to make them smaller to attain the same yield and this leads to the use of certain materials which are much more costly hence increasing the cost. The complexity of the systems is noted. As for the length of time to attain a new development in a weapon or in the technology, this is mostly the result of the fact that the field is no longer new and that to make a truly significant improvement is much more difficult than if was 10 years

previous. In reading further it seems that these questions may in part be based on the problems with the interrelationship between the complex DOD systems and the AEC devices that must be carried. This may have something to do with the "wooden" bomb concept which was to simplify the early design to take into account the relationship between the carrier and the device and not incur the cost or run into problems at the end of the line.

Here is a 2 Sept. 1960 memo from Hertford to all of the various manufacturers associated with the production of weapons under Albuquerque as well as various AEC geographical offices that are affected by Albuquerque's weapons production and it begins, "By about the middle of Sept., ALOO expects to receive from DMA a revised production directive that will materially increase the fiscal year 62 production effort across the board. In terms of numbers of units to war reserve the increase is more than 30% above quantities called out for FY 62 in present schedules." He also notes that to "prime the pipeline" there will be a substantial increase in FY 61 costs, and this workload and costs will not be uniformly distributed around the system. I mention this step-up because it might be significant but I don't know the reason for it or the basis behind the DMA decision.

Note that this was about 1 year after a 24 July 59 message from Hertford to the various AEC offices and branch offices under it on the subject of guidance from DMA on production requirements. As of that time they were waiting direction from DMA and were apparently cutting down the effort and asking the total personnel be kept at no greater than the present level with no overtime authorized. Therefore, it might be that from the summer of 59 through the summer of 60 the weapons production output decreased and therefore this effort in Sept. and Oct. of 60 might be to step the production back up.

Here is a letter from Bradbury to Hertford on 14 Oct. 59 which contains Bradbury's feelings as to the possible improvements in weapons in the next 5 years or so with and without testing.

"could be achieved with adequate confidence to warrent stockpiling. This belief does not appear to be shared by the DOD at the present time, and if this lack of confidence persists, nothing beyond what has been tested already will be achieved (from the point of view of the stockpile) if testing is not resumed."

On 9 Feb. 60, Agnew sent a document entitled "Test Proposals," No. AW-655 to all members of the ~~FSC~~ FWC (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

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.

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

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 if 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.

A 4 Aug. 1960 memo from ALOO to Starbird gives some interesting numbers that indicate the weapon laboratory contribution to the stockpile over the next few years. It is particular significant in showing what the laboratories, LASL and Livermore, have done up to this time in completing designs that the military has accepted and put in stockpile.

Thus even though the trend is for Livermore to get slightly more contribution each year, LASL still would have contributed more than 90% to the national stockpile at that time.

A 31 Jan. 61 message from Betts to the labs refers to establishing a briefing at Headquarters AEC tentatively for some time in the Feb. 7-9 period, on "Russell's problem." Betts, by this message, requests the directors to arrange for a short briefing on each labs weapons development programs in conjunction with the Russell briefing, which would be a general orientation for the chairman and possibly the other commissioners. Betts notes that he received lengthy briefings from Foster and Agnew on 16 & 20 Jan. respectively.

A message from Betts to the labs on 1 Mar. specifies the agenda for the hearings before the JCAE on the laboratories and AEC's programs beginning on 6 Mar. Among the items requested by the JCAE for laboratory briefing is "effect of the moratorium on development effort now and in the future."

Throughout this folder are periodic charts and narratives from ALOO to the concerned agencies containing an updated list of the various weapons in stockpile of being developed and what the planned dates for production and entrance to stockpile and what the planned uses on the military systems with those details are.

In Feb. and Mar. of 61, at the request of Betts, the "certification" procedures used by LASL and Livermore were to be reviewed and coordinated through ALOO with several directives from Betts. Noting that this process has been going on for some time and further stating that it will probably remain with us for some time he feels that there should be a definitive formulation of the procedures. Among his guidelines are that no agency or laboratory outside of the AEC should be involved in the process prior to certification and leading up to certification; that DMA expects to hear the final results and justifications and statements from the laboratory which originated the design; that it include the procedures not only under the present no testing situation but extrapolated a future of no testing or

of a possibility of limited testing; and a specification of when these certifications should fit into the overall development process for a device. After personal discussions of this by Bradbury and Brown, and then by the Livermore and LASL staffs in the inter-laboratory meeting of 17 Mar., Hertford sent the final agreed procedure to DMA on 24 Mar. under the heading of "Establishment of Weapons Technical Review Procedure." Bradbury did not like the term certification of guarantee.

Here is a 3 April 61 transmittal of some program assumptions and details for the FY 63 weapons program and weapons budget as seen by ALOO. Included is a note about testing which says "It should be assumed, for purposes of the budget submission, that the suspension of full scale tests will continue through FY 63 but that a supplemental appropiation will be granted if full scale tests are resumed." Also there will be no test construction activities at the NTS but existing facilities and equipments will be maintained and a certain amount of development of instrumentation for diagnostic and telemetry related to high altitude and underground tests is noted. Also assumed by ALOO is that the seismic improvement (Vela Uniform) program will be carried out as planned with supplemental funding.

Here, for completeness, are some notes on the inter-laboratory meeting of 17 Mar. 61 between LASL and Livermore at Livermore. Among others the following were in attendance: Bradbury, Eyster, Mark, Agnew, Harold Brown, Foster, Sewell, and Haussmann. Also from Sandia was Schwartz. Already incorporated in a draft of this period of time being written were notes on the discussions about readiness but I will quote them here for future reference: "Bradbury stated that he did not understand why there should be great urgency to resume testing immediately after the receipt of permission therefore since it did not seem likely that testing, once resumed, would be soon again subject to pressures to stop. Dr. Brown stated

that LRL felt more urgency to develop a readiness program because by reducing the present six month to one of approximately 2 months, the urgency of any future decisions regarding nuclear testing will be increased and the possibility of using long lead time as an excuse to delay decision will be eliminated. He advised that LRL was going to press for a readiness program. LRL will send in another letter in the near future which will outline an up-to-date readiness program." In reviewing these minutes before they were sent in, Bradbury communicated to Brown "I must admit that I have since imagined a situation in which the Russians walk out of the Geneva conference loudly proclaiming that they won't be the first to test and then rush off to the UN to get a resolution denouncing testing (which they probably could). Under these circumstances, the U.S. might be willing to ignore the first part of the episode but not the second, and thus we might find ourselves with a very limited time to get off a test of two."

A 27 April 61 letter from Bradbury to Betts notes that the present information DMA is that the amount to be given LASL for weapons thru FY 62 is about 2 million short of what they estimate to be their needs. He notes that they can possibly live at this decreased if they have to and details how they reduce their spending, about 1/2 of which would be to reduce activities in certain local areas. However, he doesn't wish to curtail any of this and asks DMA to clarify whether they will try to fight for the money of just how LASL should act.

The 25 May reply from Betts to the minutes of the Mar. inter-laboratory meeting, makes a few comments expecially on weapons assignments. Noting that the labs assume the moratorium would continue under present ground rules, he states "However, we must be careful not to permit ourselves or our thinking to become too completely "conditioned" to a "no test" environment. When and if the moratorium is lifted, as there is at least a reasonable chance that it will be,

I would like to see us work out a more delibrate and orderly overall pattern within which we should conduct our future weapon developmental program." It is certainly not surprising to hear Betts say this as of this date in May.

Here is a 21 June message from Betts to Bradbury and Foster, documented elsewhere which refers to previous letters and a meeting attended by Bradbury and Foster of the Commission on June 20. Betts notes that the AEC and DOD are to prepare a joint test list and that he intends the LASL and LRL version presented on 20 June to the Commission to be the first part of an intergrated list. Some of the details of the DOD suggestions and comments are of interest.

Betts desires detailed comments from the labs on the desirability of the DOD's suggestions of these devices as well as longer range items and safety shots.

In one of his two replies to Betts' requests on 27 June, Bradbury, in addressing the LASL long range test program gives some attention to fusion weapons in noting that they are absent from LASL's list. After discussing the fact that LASL does have interest in this concept but clearly does not see any practical application of it yet, he states "These comments are included here only to make it clear that we have not included the obvious item because we are either neglecting it, have forgotten it, or believe it to be impossible, but rather that the whole area is presently too nebulous in technical fact and in actual military application to warrant the distinction of being included in a 1961 forecast. However, if you think that this spoils the current love feast by all means add fully fused full fashioned fusion weapons as an item to our long range program."

He also notes as desirable experiments concerned with the effects of nuclear bursts on warheads and re-entry bodies and communication in general. There is no mention of any such thing as Urraca.

A 27 June letter from Bradbury to the Manager of LAAO, J. Burke, notes that the problem with the LASL weapons budget will not affect the local program as previously hypothesized but another method has been found to defer the cost and stay within the 42 million dollar ceiling.

Here are some most interesting words from Bradbury and Mark sent to Weisner in the White House on 17 July 61, presumably in response to the on-going studies of the ~~PAC~~ PSAC and the Panofsky Panel to investigate the possiblity of Soviet cheating. In answer to questions concerning the gains from future weapons testing, in areas such as the neutron bomb; whether the Russians have been secretly testing; whether the U.S. should unilaterally resume testing; where the U.S. is vs. the USSR in nuclear weapons; and whether the Russians will cheat if we do not resume testing; Bradbury and Mark have the same general feelings with a few specific differences in their answers. That is that they do not believe the Russians have been secretly testing, or in the case of Mark, if they have, the rather low yields attainable could not permit important changes in strategic capabilities. Neither man feels that there is an urgent need to resume weapons testing, particularly as far as there being a strong military urgency. Furthermore, they don't see any great advances to be made from weapons testing, probably about a factor of two increase in yield per pound for higher yield weapons and some efficiency increase in smaller weapons, and in particular don't see the development of a neutron bomb as practically likely. About the only area that they see where substantial gains could be made from testing seems to be high altitude effects and vulnerability tests and neither feels there is an overriding importance to this area since the other side certainly does not have that information either.