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OFFICE MEMORANDUM

ALAMOS SCIENTIFIC LABORATORY  
UNIVERSITY OF CALIFORNIA  
LOS ALAMOS, NEW MEXICO

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DATE 1 APR 1953

TO : C. L. Tyler, Manager, Santa Fe Operations Office DATE: ~~1 APR 1953~~  
FROM : N. E. Bradbury  
SUBJECT: Weapon Test Program  
SYMBOL : DIR- 814

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- 1. Your TWX T-6 of March 27 requests comments on the recently proposed weapon test program. For convenience, the original budget assumption and the current proposal are listed below:

CURRENT PROPOSAL

BUDGET ASSUMPTION

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<u>CURRENT PROPOSAL</u>			<u>BUDGET ASSUMPTION</u>		
Fall 1953	Nevada	"DOMING"	Fall 1953	Nevada	"DOMINO"
Spring 1954	Eniwetok	"CASTLE"	Spring 1954	Eniwetok	"CASTLE"
Fall 1954	Nevada	"TEAPOT"	Fall 1954	Nevada	"TEAPOT"
or					
Spring 1955					
Fall 1955	Eniwetok	"REDWING"	Spring 1955	Eniwetok	"REDWING"
or					
Spring 1956					

2. The only fixed operation at the present time is CASTLE since DOMINO is still on a tentative basis and will remain so until well after the conclusion of UPSHOT. CASTLE is an operation of considerable length and probably will not be concluded until sometime in May, 1954 - assuming that present ADP schedules permit its start as scheduled. Design details of CASTLE devices will depend upon examination of the UPSHOT results, and not upon DOMINO unless a specific determination of the yield of the primary bomb is required at that time. It should be noted that the elapsed time between UPSHOT and CASTLE is a minimum from the point of view of fully integrating the experimental information obtained from the former into the designs proposed for test in the latter.

3. The results of the CASTLE experiments cannot be obtained in time to have any great bearing upon an operation (TEAPOT) the following Fall in Nevada. It is very likely that, in type of experiment, TEAPOT will bear the same general relation to the following Eniwetok Test (REDWING) that UPSHOT bears to CASTLE. Accordingly, an appreciable time must be allowed between TEAPOT and REDWING. The IASL is of the opinion that TEAPOT may well not occur until Spring of 1955 in order to permit the greatest time for absorption of the CASTLE results and the preparation of suitable and well thought-out subsequent experiments. As we are discovering at the present time, the

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most effective use can be made of the information obtained if a time of the order of a year elapses between a preliminary experiment and the time a large and complicated device based upon it is tested. Much of the work on CASTLE devices is predicated upon assumptions regarding UPSHOT results. If these assumptions are erroneous, then CASTLE may be delayed and considerable work and money will have been wasted. Using the UPSHOT-CASTLE interval as indicative, it is clear that REDWING must not occur sooner than about a year after TEAPOT. Since we regard a Spring 1955 TEAPOT as more likely than a Fall 1954 TEAPOT, this places REDWING most likely in the Spring of 1956.

4. The point is sometimes made that unpleasant surprises in CASTLE will force a sudden new test program at Nevada or Eniwetok. It should be pointed out that an unpleasant surprise at CASTLE is most likely to concern the

If this turns out to be the problem, there will be no need for an urgent "quick and dirty" test program, because the device will be useless as a weapon until there have been prolonged further studies and completely new (and at present unavailable) ideas incorporated. In other words, no failure that we can foresee at CASTLE is likely to be cured by a quick test.

5. After the emergency capability (or capabilities) are presumably demonstrated in CASTLE, there will undoubtedly come a period in which these devices are engineered into more tractable weapon systems. Improvements in efficiency and weight, it may be hoped, will be incorporated as well. However, the process of "streamlining" the system is not something which will take place rapidly. It is our opinion that tests of rather fully engineered systems might be carried out in a Spring 1956 REDWING whereas emergency-capability systems would have to be used in a Fall 1955 REDWING. Thus, a considerable saving in effort and money could be effected through combining proof testing of engineered versions and development testing of ideas arising from TEAPOT results, in a single operation in the Spring of 1956. As indicated above, if REDWING is held in the Fall of 1955, full use cannot be made of TEAPOT results and an additional series of tests will probably have to be carried out later to proof test engineered versions.
6. We would like to suggest that it is not necessarily efficient or economical to test every idea as soon as it comes to mind; that a period of study may suggest either better ideas or the dubious quality of those first appearing. Although the IASL has pioneered in the concept of full nuclear tests, we feel that it is easy to overdo and that considerable criticism can rebound on the Laboratory in consequence. Up to the present there has been an intense effort to obtain a weapon capability in the megaton field; this should be met by CASTLE. Its improvement is going to be a difficult and probably not spectacular process and will probably be largely directed

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at decreasing the weight at the smallest cost possible in yield. However, the aircraft which can now carry such weapons exist and their performance is only moderately affected by modest decreases in weight. New aircraft, which might carry a somewhat lighter device than currently envisioned, are a number of years in the future, and thus, we may see weapon and aircraft development reasonably paced together. Other applications such as ~~SECRET~~ systems (in their present concept) merely do better what is already done and do not yet open up new capabilities. Unless new ideas are found, development of the ~~SECRET~~ type does not seem to warrant a frantic test program.

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- 7. We are aware that UCRL is, perhaps, interested in a somewhat more intensive test program than we are proposing. We are not in a position to say whether or not there are valid reasons for this interest. However, the currently proposed test program is one which IASL facilities, including J-Division, can support. We would not be in a position to provide the administrative support as we have in the past to additional test operations and other means must be found for their conduct if this appears essential.
- 8. In summary, and in specific reply to the questions raised in TWX S-185 March 27 from Fields, it is the opinion of IASL that

- (a) The budget assumption test schedule is too rapid to permit proper evaluation of the results of one program and their effective use in the next; that the IASL would be unable to provide the level of prior study and investigation which should precede each test program; and that the IASL would be unable to provide the J-Division type of technical support for tests conducted at the assumed rate.

- (b) The above proposed test schedule with the dates of REDWING and TEAPOT indicated will not have an adverse effect on weapon development; but, on the contrary, the same rate of development over the next several year period can probably be attained at less cost through the greater use of drop tests.

- (c) No other plans than the vague ones for DOMINO have been made for "impromptu" tests, although it is not unlikely that tests of this character may be requested if the fission weapon development program warrants. It is unlikely that the range of yields for ~~SECRET~~ other similar systems are of interest will be appropriate for Nevada.

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N. E. Bradbury  
Director

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- 1A, 2A - C. L. Tyler
- 3A - A. C. Graves
- 4A - Reading File
- 5A - File

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