Bundy 40



UNITED STATES ATOMIC ENERGY COMMISSION

WASHINGTON 25, D.C.

DEC: 3 15

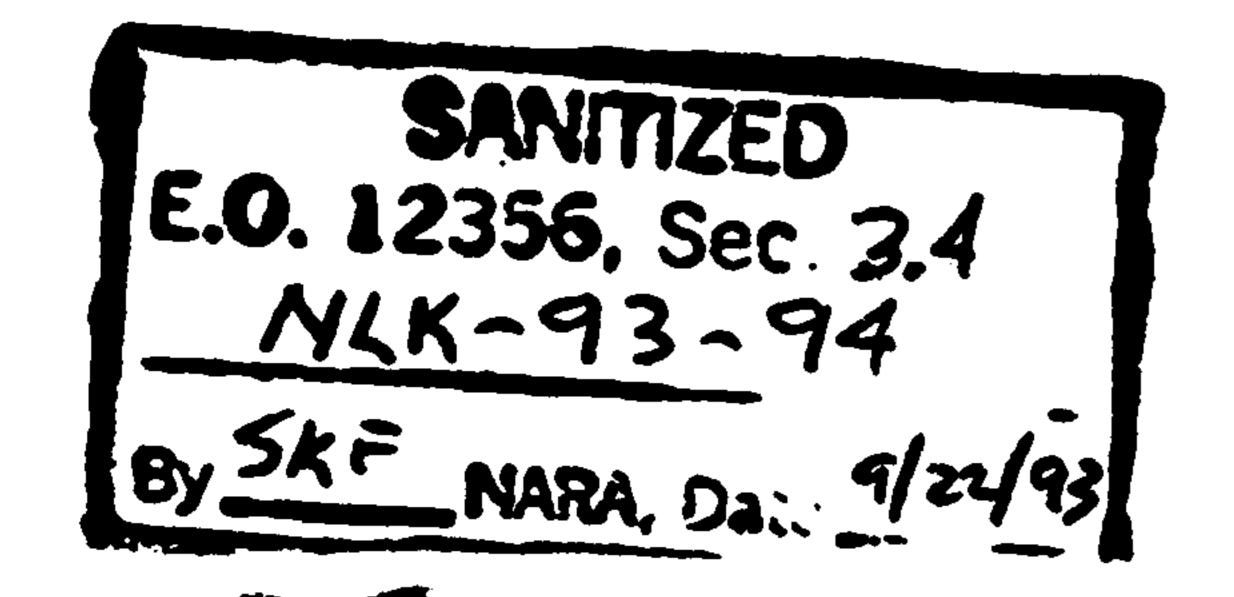
Dear Bob!

3028

The purpose of this letter is to provide estimated present capabilities and limitations as well as our projected capabilities in high yield verpon development. (See enclosure 1 for detailed discussion.) As a result of the recent stroopheric series, the AEC has successfully permed exempts which may look to extremely high yields in relatively light configurations but with relatively lerge dimeters. In view of these echievements, we have reviewed our espebilities and associated problems pending a decision to continue development of large yield devices. Dr. Johnson, ATED(AE), by letter deted August 7, 1962, provided the AEC with the possible requirements of the DOD for melesr vecpon developments, including those which were being considered for application of high yield devices. Accordingly, our enalysis has been made of our present and projected capabilities to develop wespons vis-e-vis the proposed requirements of the DOD. For your information, specific systems for which possible future requirements were considered are:

- s. High yield FUFO bomb for the 3-52 sirersft,
- b. High yield werheed for TITAL II (without re-entry), and
- c. High yield werheads and bombs for IIIAH III, Seturn and the C-133B.

Our present nuclear capabilities to produce advanced high yield weapons can be estagorized under three general areas. The first would be the result of refining and increasing of the size and weight of conventional nuclear systems------. It is perhaps in this area that



546

large systems could be evailable in the shortest time. The second estagory is that of pursuing the consequent that a second generation high yield system with relatively high afficiencies and light weights when compared to the first estagory; housver, waspens associated with this essays may have volume limitations. The third estagory, the third generation of high yield devices, involves concepts yet to be proven fassible. It is in the latter estagory that we hope to schieve the ultimate in high yield, low weight and ecceptable volumes. The enclosure reflects a more detailed description of espabilities within each of the above areas.

There are several factors other them technical (as discussed in the preceding paragraph) which are partiment in considering the development and production of high yield weapons, defined as those with energy release greater than 15 Mr. These factors are:

- a. Testing. Additional atmospheric testing will be required for the development of any high yield waspens. The amount of testing will very depending on the complexity of the requirements. For instance, to develop only a high yield FUFO bomb, besed on extrapolating present technology, perhaps one test would suffice; to pursue development of several systems using advanced concepts will require numerous tests, possibly spaced over several years.
- the resources of the ASC must be determined after specific requirements which closely define the size and uses of proposed verpon have been established. For example, the fabrication of high yield madear compensate will require the headling of shapes larger than our production facilities one presently accommodate. Special production equipment must be presently this requires additional lood time which would not be required for a loos redical program. If a high yield boub is required for lay down application, a new technology as well as a unjor non-nuclear test program will be required in order to assure sufficient structural rigidity combined with adequate drogueing to achieve

this end. Although those are formidable problems, their ultimate solution is within the capability of the ABS. However, the cost of such a development program is great; either other weaponization programs must be delayed, or additional resources must be forthcoming.

d. <u>Presidential Ameroval</u>. Implicit in the decision of an earlier education is the requirement that Resoutive approval must be obtained prior to a major development and production effort to achieve a high yield weapon capability. Defore expanding our current program to such a major effort, we believe that Presidential approval should be obtained.

In summery, we wish to emphasize our confidence that the AEC can fulfill the many demands placed upon it if a decision is made for the United States to emberk on a high yield weapon capability. However, we would also like to emphasize that a high yield weapon development effort represents a major financial and technical drain on our resources which we would be extremely reluctant to emberk on unless a firm decision were forthcoming which would justify our effort. We realize that this is a complex decision; one that will allow the necessary nuclear testing as well as the establishment of firm requirements. With regard to nuclear testing, we could be ready for a test series as early as late summer or early fall of 1963. At the present time, these test preparations do involve the selection of technical designs and areas in which we intend to explore. To this end, your specific requirements, particularly in the area of high yield weapons, are, of course, solicited.

While the question of the military requirement for very high yield weapons is one for your decision, we are all swere that the USSR has a definite high yield capability, and the accruing politico-psychological advantages thereof are being exploited to the maximum. It may well be that more than purely military needs ought to be considered. I suggest, therefore, that we prepare a joint latter to the President raising the question as to whether we should have a high yield weapon capability, considering not only the military requirements for such weapons, but also the resulting political implications.

If you wish to discuss this subject further, we will be most pleased to do so. A copy of this letter is being provided to Mr. McGeorge Bundy.

Sincerely yours,

Simme, Said.

Chairman

The Bonorable Robert S. McHemara The Secretary of Defense

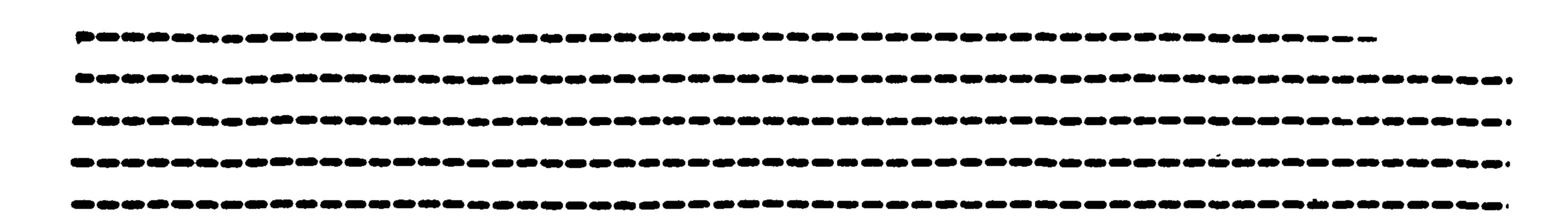
bcc: Honorable McGeorge Bundy (Cy #3A)

Enclosure: Estimate of the AEC Capabilities for the Achievement of High Yield Weapons

POR THE ARE CARMINED TO THE PARTY.

Eirst Generation Doobs			
Pirst generation high yield weapons would be			
fidence in our ability to provide weapons in the magaton range with rather firm dimensional and weight estimates. Current capabilities of the two meclear laboratories on first generation weapons are as follows			
4. (1	The Los Alamos Scientific Leboratory has provided the following persenters on a conceptual high yield bomb:		
	trade-off, but the management of this peture, a test w	- 100 MT - 20-30 MT - 30,000 lbs 66 in 276 in 10,000 lbs. additional y slightly the stated weight and yield ximm yield-to-weight appears to be equirement materializes for a weapon of build be proposed of a clean version . A excess of three years would be required	
	The LASL has also pro	posed a clean version of the above weap- ld be required to test such a develop-	
	testing would be about a, further extrapolationdevice weighing about a comparison of the tr	evelopment period to ready such a device one year. With an additional period of a second result in a set 30,000 lbs. et 30,000 lbs. et ory has used a different initial contra approaches reflects that within the t would be feesible to design	

2	ecol Concretics		
	Operation Dominic. The gratifying results of this test opened a new range of possibilities in the design of high yield thermomecless werheads, particularly in weights above 1,000 lbs.		
ъ.			
•	This ecocopt, as opposed to the more		
	yields and weights which are achieveble - Carrent estimates of		
	Tield Tield		
	2,000 lbs. 18,000 lbs.		
Q .	Several points should be noted		
	Further, to develop any particular weaponised version will probably require at least two atmospheric tests - one experimental test at the approximate weight and yield, plus a prototype test. Lestly, it is estimated that at least a four year developmental period will be required to TFU for any veaponised version		
	rd Generation		
	To approach further the theoretical upper limit yield-to-weight ratio, it is necessary to		
	•		
	.—————————————————————————————————————		
	•======================================		



b. It is premeture to predict espebilities in this area; however, a test involving this principle is planned for inclusion in the next series of stmospheric tests.

Mork Loos

The impact on the ABC development and production complex to initiate a specific high yield vecponisation program is of considerable magnitude. This is understandable when one realizes the weights, volumes and types of metarials being considered. Also, with respect to pre-production tooling, the ABC will have to establish new fixtures and equipment of magnitudes heretofore unknown insofar as nuclear wesponry is concerned. In summary, to produce high yield weapons will require a scope of effort such larger than any previous ABC weaponisation effort.