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Authority 44472

DASARZ 930

28 August 1962

MEMORANDUM FOR: CAPTAIN W. F. V. BENNETT, USN
MILITARY ASSISTANT TO ATSD (AE)

SUBJECT: AEC/DOD Study

1. Reference is made to ATSD (AE) Memorandum to Chief, Defense Atomic Support Agency (DASA), subject, "AEC/DOD Study on Short/Long Term Effects of Nuclear War," dated 14 August 1962.

2. The purpose of this memorandum is to provide a status report of the progress of the AEC/DOD Study contribution by DASA to the fall-out and ecological study now under preparation by the AEC. The completion date of the DASA analytical effort and the compilation of data into a final report to the AEC is now estimated to be 4 September 1962. This is also the delivery date for the presentation of material requested by ATSD (AE) (reference 1).

3. It is recognized that there have been several inaccurately forecasted completion dates for the DASA effort. The delays in presentation of the final material are attributed to:

- a. The complexity of the study project.
- b. Changes in parametric inputs during the conduct of the study project.
- c. The necessity for the collection and application of detailed, current and accurate data.
- d. The computer programming and system design complexities and efforts commensurate with the level of detailed analysis required.

4. The complexity of the DASA contribution to the study has exceeded all past experience in this area. Although it is disappointing for all concerned that the estimated completion dates have not been met, it is sincerely felt that the nature and importance of the project warrant the time and effort required to accomplish the project in a thorough, competent and detailed manner.

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Authority: 44472 By:
Monica Oyola-Coeur
Date: 03-09-2017

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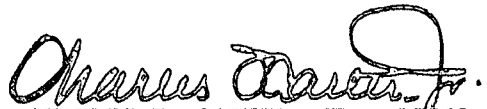
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5. Mr. Hal Hollister, AEC, was informed on 27 August 1962 of the delay in submission of the DASA material.



CHARLES F. CARTER, JR., LTCOL, USA
Chief, Research and Analysis Division
DASA/DODDAC

Copy furnished:

Mr. Hal Hollister, AEC

~~SECRET~~PARAMETERS, ASSUMPTIONS, AND CONCLUSIONS
AEC/DOD STUDYGENERAL

1. A study has been prepared by the Department of Defense Damage Assessment Center (DODDAC), an activity of the Defense Atomic Support Agency (DASA), as a contribution to a long term biological/ecological study under preparation jointly with the Atomic Energy Commission.

2. A portion of the DASA/DODDAC study addresses the relative effects on population resulting from the employment of clean nuclear weapons as compared with normal, or standard, weapons. The parameters, assumptions, discussion, and conclusions from this portion of the study are as follows:

PARAMETERS

3. A range of nuclear weapon attacks totaling approximately one thousand, three thousand, and ten thousand megatons was postulated against combined military and industrial targets in the USSR. A subset attack against the military targets only was also postulated but with correspondingly less yield. Discrete single weapon yields of 1MT, 5MT, and 20MT were utilized in the attacks.

4. Two real world target systems, based on current intelligence, were attacked hypothetically as follows:

a. Combined attack against

(1) Important military targets such as long and medium range airfields, missile facilities, nuclear weapon storage sites, submarine bases, command centers, supply depots, and others.

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(2) War support industries such as missile factories, nuclear weapon production plants, atomic energy installations, aircraft plants, large power plants, and others.

(3) Major industrial centers.

b. Military targets only as a subset of the combined attack described above.

FOIA(b) (3) - 42 USC 2162(a) - RD DOE EO13526 6.2(a)

7. In order to describe shielding of population, residual numbers, a measure of attenuation of radioactivity, were used. The residual numbers ranged from .005 to .70; the lower the residual number, the more efficient the shielding.

8. Specific weapon delivery systems were not selected; accordingly, a 3000 ft. CEP was used for all weapons delivered. No other operational factors were considered.

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~~SECRET~~ASSUMPTIONS

9. In order to avoid the extreme and erratic winter and summer winds in the USSR, a mean spring seasonal wind was chosen. This resulted in a generally west-to-east wind.

10. Soil composition was assumed to be a meld of the two most dominant types in the USSR; however, recognition must be given to the fact that soil composition varies materially throughout the USSR.

FOIA(b) (3) - 42 USC 2162(a) - RD DOE EO13526 6.2(a)

DISCUSSION

12. The basic model for the calculation of casualties is a mathematical representation of the spatial distribution of the stabilized cloud's radioactivity which is then deposited downwind as a function of particle fall velocity, wind speed, and wind shear. The USSR is divided into some 7500 cells ($\frac{1}{2}^{\circ}$ longitude, $\frac{1}{3}^{\circ}$ latitude), and assessments are made against the urban and rural population therein based upon the radioactive particles deposited.

13. The general attack philosophies are as follows:

a. In the 1000 MT attack, mostly 1MT weapons were used (519 @ 1MT, 91 @ 5MT, and no 20MT) to achieve on the order of 50% probability of moderate damage to the targets selected.

b. In the 3000 MT attack, the numbers of weapons by type were changed (369 @ 1MT, 141 @ 5MT, and 97 @ 20MT) to achieve a high probability

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of severe damage. No increase in number of targets attacked was made over the number in the 1000 MT attack.

c. In the 10000 MT attack, the numbers of weapons by type were again changed (220 @ 1MT, 104 @ 5MT, and 463 @ 20MT) in order to achieve a very high probability (90% or greater) of severe structural damage where required. One hundred and eighty new targets were added in a manner to maintain the military and non-military target symmetry.

FOIA(b) (3) - 42 USC 2162(a) - RD DOE EO13526 6.2(a)

The tabular presentation of fatal casualties is shown at _____, and the graphical presentations are shown at _____ (combined attack) and at _____ (military target attack only).

CONCLUSIONS

15. Attacks employing all surface-burst normal weapons against a broad target array cause 50% (10000 MT attack) to 100% (971 MT attack) more fatalities than similar attacks employing surface-burst clean weapons.

16. Air-bursting of weapons is the most sparing of the population, although at about 1000 MT weight of attack, fatalities are about the same from (a) an air burst-combined targets array, (b) a clean weapon-surface burst-combined targets array, or (c) a normal weapon-surface burst attack against military targets only. For lower weights of attack, clean surface bursts will cause somewhat fewer casualties than the same air burst technique.

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FOIA(b) (3) - 42 USC 2162(a) - RD DOE EO13526 6.2(a)

13. The targeting philosophy is as important as weapon type in affecting population. Attacks employing all clean or all normal weapons, as well as attacks employing all air bursts or all surface bursts, are not the most efficient and are thus not realistic. Optimum targeting involves a mixture of air and surface bursts; accordingly, fatal casualties for an actual attack should be an interpolation between the air burst and surface burst curves according to the optimum air/surface burst weapon mix.

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