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PRESIDENT

January 18, 1964
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Major General A. W. Betts
Director of Military Application
U. S. Atomic Energy Commission
Washington 25, D. C.

AUG 17 1965

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Re: AEC's Weapons Vulnerability Effort

- References:
- (1) The ARES Program, SC-DR-64-37
 - (2) BAGPIPE Report, SCL-DR-64-30 ^{1543/4456} 8232-2/1223
 - (3) Experimental Thunder Facility Report, SC-DR-64-34 ^{3410/3}
 - (4) Sandia Vulnerability Program, SC-DR-64-32
 - (5) Instrumentation Systems for the AEC Weapons Effects Program, SC-DR-64-35 ^{3412/31}
 - (6) Consolidated S.C. Budget Statement covering References 1 through 5, RS 1/1459

Transmitted by this letter are the documents listed as references above. In the aggregate they describe the major activities now under way at LRL, LASL and SC which, taken together, cover those areas of investigation which need to be probed if the three AEC Weapons Laboratories are to be able to develop nuclear warheads that can penetrate enemy defensive countermeasure to the desired point of detonation. The results of these studies are basic to future design of warheads, independent of the details of the delivery system.

Although some may question the need for extensive experimental activity on both the ARES and BAGPIPE test vehicles, their sizes, weights, and structural details are quite different, hence their responses to countermeasure inputs is expected to be different. We believe that experimental work with both assemblies will enable the development of theoretical techniques for predicting response under attack of a broad span of interpolated and extrapolated designs. As the test data becomes available and as we are able to explain and/or predict the results by calculational techniques, we can narrow the scope of the experiments. When, and to what degree is yet to be demonstrated, but results to date are quite promising.

The "Thunder" effort, Ref. 3, is an experimental technique for obtaining quantitative data on the conversion of shock wave energy to structural loading and response.

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Maj. Gen. A. W. Betts, DMA

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Sandia Corporation's basic vulnerability effort described in Ref. 4 rounds out the total spectrum of damaging countermeasure phenomena which must be studied, supplementing the information to be gained through the BAGPIPE and ARES efforts.

Ref. 5 describes the special instrumentation required to monitor the input and response of articles to be tested in conjunction with the underground nuclear detonations at NPS.

Ref. 6 consolidates in one document all of the FY '64 and '65 monies required by Sandia Corporation over and above our normal R&D budgeted activity to accomplish our portion of the work described in Refs. 1 through 5.

If we can furnish any additional information that will be helpful to you in obtaining approval for this over-all AEC weapons vulnerability program, please let us know.

Enclosures: (6)

- (1) RS 1543/14256
(2) RS 8232-2/1623 *5000*
(3) RS 3410/30
(4) RS 3410/28 *7500*
(5) RS 3410/31
(6) RS ~~3410/1459~~ *1/1459*

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