[redacted]

UNCLASSIFIED

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Name: W Layne	3. Contains No DOE Classified Information
2nd Review Date: 3/6/97	4. Contains: Nat.
Authority: ADD	5. Contains: UCNI
Name: R Williams	6. Comments: ok for Openwet

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CR File: 1-5

Edward N. Parker
Rear Admiral, USN
Chief, AFSWP
Washington 25, D. C.

Attn: Lt. Col. E. E. Pickering, SWPBS

Thru: K. F. Hertford, Mgr., ALO

Thru: Brig. Gen. A. D. Starbird, Director, DMA

We enclose a proposal for a project to be undertaken in Operation Trumpet in Nevada next year, one of two which you have been expecting.

This one, "Low Overpressure Blast Study", is of interest to us because the concepts involved are closely related to the microbarometric studies in which we have been engaged for the past six years. The proposal on underground strong motion measurements is not complete. However, you have seen a rough draft and have sent us comments on it.

For your convenience, we have tried to prepare the enclosed proposal in unclassified language.

Very truly yours,

ORIGINAL SIGNED BY
GLENN A. FOWLER

"[redacted] is [redacted] by law."

MLM:5110:abp
Enc. Uncl.
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SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP	
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Emeldra Selph 3/12/97	RECORD ID: 97SW921
PERSON CHANGING MARKING & DATE	
Carmela Gallegos 3/13/97	DATED: 3/6/97
PERSON VERIFYING MARKING & DATE	

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PROJECT PROPOSAL

1. Proposed Project Title: Low Overpressure Blast Study

2. Sponsor: Armed Forces Special Weapons Project and Sandia Corporation

3. Responsible Organization: Sandia Corporation

4. Project Officer: H. G. Lauren

5. Objective: To obtain a better understanding of the mechanisms responsible for the variations from scaled blast-wave overpressures in the range 0.1 to 2.0 psi.

6. Procedure:

Since hydrostatic and kinematic structures of low-level atmospheric layers are considered to be of prime importance to blast-wave propagation it is proposed to perform a detailed investigation of the 500-foot deep surface layer in Yucca Flat during typical blast conditions. Two 500-foot towers to be erected in likely locations to receive overpressures in the desired range from future tests would contain the following instrumentation: temperature sensors at 4, 25, 50, 75, 150, 225, 300, 375 and 500 feet; wind speed and direction sensors at 4, 100, 300 and 500 feet; overpressure gauges at 4, 50, 300 and 500 feet. Continuous records of temperature and wind data collected from about midnight to 0900 hours local time for various weather situations would be invaluable to the objective.

It is suggested that one tower (Mark A) be located on the west side of the Mercury Highway about one mile north of the Yucca weather station and the other tower (Mark B) be located about 1000 feet due west of the CP, nine miles north of the CP. Selection of these sites is based upon: (a) proximity to main road and utility lines, (b) near expected position of most prominent temperature lapse conditions (valley floor), and (c) locations most likely to receive desired pressure ranges (based on Plumbbob schedule).

In addition to the pressure gauges on towers, ground-based gauges between the towers and between Tower A and CP about two miles apart should be installed. Such a line of pressure gauges would enable a study of the pressure wave shape change as related to various meteorological conditions with radial distance out from blast.

Most of the collected data may be recorded near the collection point; however, about eight channels of data per tower should be telemetered to the CP for operational use by the blast prediction unit. Desired data at CP include (from each tower): temperature at 4, 50, 300 and 500 feet; wind speed and direction at 100 and 500 feet.

7. Project History:

Currently, about the only available sounding data for Yucca Flat is that which has been obtained from radiosonde runs at one place. These are adequate only for obtaining a general picture of the structure, but are inadequate for determining smaller scale spatial and temporal variabilities believed to be important to the problem. One experiment was done during Teapot (WT-1103) involving the separation of incident and reflected shock wave from a high altitude shot but no attempts have been made to do this for "surface" shots.

Attempts have been made to calculate the expected overpressures in connection with blast prediction requirements during past operations, but most efforts have been frustrated by lack of knowledge of the true meteorological input to the problem (inversion height, strength, complexity and variability).

8. Special Requirements or Conditions: None

9. Justification for Full-Scale Test:

Besides obtaining a feeling for the climatology of the problem, tests are needed to determine the actual effect on propagating blast waves. However, no special test for this sole purpose is necessary.

10. Costs:

The following estimates are considered accurate within ± 10%, and do not include salary and overhead:

2-500 ft. towers installed		$ 75,000
Cable installation		
Tower "A" to CP	15,000	
Tower "B" to "Y"	1,500	
Instrument cables on towers	2,000	
		18,500
12 overpressure stations including gauges, recorders, towers and shelters		30,000
8 wind speed and direction gauges including power supplies and recorders		12,700
18 temp. gauges including recorders		12,300
Charts for recorders		5,400
Spares		10,500
Miscellaneous		7,500
Total		$ 171,900

11. Photographic Support: None

12. Other: Sandia Corporation proposes to do this experiment as a specific project under the Sandia Task Group.