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UNCLASSIFIED PROGRESS REPORT FOR PERIOD

25 December 1965 to 7 January 1966

for

Contract Sandia 13-8888

| SANDIA SYSTEMATIC DECLASSIFICATION REVIEW | |
|---|---|
| 1 st Review Date: <u>12-7-95</u> | Determination (Circle Numbers): |
| Authority: <input checked="" type="checkbox"/> ADC <input type="checkbox"/> ADD | 1. Classification Retained |
| Name: <u>W. C. LAYNE</u> | 2. Classification Changed to: <u>UNCL</u> |
| 2 nd Review Date: <u>12-8-95</u> | 3. Contains No DOE Classified Information |
| Authority: <u>ADD</u> | 4. Coordinate With: _____ |
| Name: <u>K.D. Smith</u> | 5. Contains UCAI? <u>No</u> |
| | 6. Comments: _____ |

Submitted to

Sandia Corporation
Albuquerque, New Mexico

| SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP | |
|--|------------------------------|
| CLASSIFICATION CHANGED TO: <u>U</u> | AUTHORITY: <u>K.D. Smith</u> |
| <u>Imelda Selph 05/23/96</u> | RECORD ID: <u>95SN002</u> |
| PERSON CHANGING MARKING & DATE: <u>12-1-95</u> | DATED: <u>12-08-95</u> |
| PERSON VERIFYING MARKING & DATE: _____ | |

Submitted by

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EXCLUDED FROM AUTOMATIC
RECLASSIFICATION
DO NOT APPLY

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INTRODUCTION

This is the fifteenth in a series of letter progress reports issued in accordance with the documentation requirements of Sandia Corporation, Contract 13-8888, dated 24 May 1965. This report covers all work performed through 7 January 1966.

TECHNICAL DISCUSSION

Four lot X-3 configuration units were manufactured with a modified firing mechanism cap in that the standard cap was replaced with a unit 3/4" in length. The extended cap was necessary to accommodate a longer firing pin spring with an overall free length of 1.1 inch. This spring is constructed of 0.038 music wire and has a spring rate of approximately 28 pounds per inch. This testing was necessary to eliminate spring damage due to the ejection forces. Testing performed by Sandia has shown that the present spring is too near its closed height for proper functioning after being subjected to high acceleration loading. Furthermore, this testing has shown that the shorter spring and cap mechanism has been damaged by indentation of the cap and setting of the spring prior to release for primer initiation. The testing performed at Flare-Northern Division will be used to correlate with testing to be performed at Sandia.

Four units subjected to high velocity testing were ejected by a charge of 120 grains of Hercules 2400 Powder and should have approached an ejection velocity of 1200 feet per second. Of the four units tested, only one infrared source was ignited; the remaining units were damaged within the launch barrel. After inspection of the recovered firing mechanism, it was found that the primers were well dented and had been properly initiated. The failure to ignite the infrared source was due

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to the damage inflicted on the unit during ejection. It is not known at this time whether the damage is a result of the high powder charge and case pressure or is a result of the discrepancy within the launch barrel. As this testing will be repeated by Sandia Engineering in their launch device, no further high velocity testing is anticipated.

Upon further examination of the recovered hardware, it was found that, in each case, the firing pin spring cavity was covered with a green residue resulting from the ejection charge. A small quantity of this residue was also found inside the primer cap holder, presenting the possibility of gas leakage through the mechanism to the charge cavity. The short duration of the unit within the launch cavity precludes the possibility of the putty charge being initiated by this leak. It is possible, however, that leakage in this method could cause ignition of the charge at lower velocities and longer barrel times.

The last observation resulting from this testing showed that the extended firing spring was set approximately one-tenth inch from its original length. It is assumed this setting occurred after primer impingement of the firing pin and is the result of reaction force. As primer functioning would occur in each case, the apparent loss in length of 10% is not sufficient to warrant modification of this device. It is therefore proposed, with the approval of Sandia Engineering, that the extended mechanism be incorporated to the balance of the units. This incorporation is further dependent on the test results to be obtained by Sandia.

PROPOSED WORK

No additional testing of the Flare-Northern Model E225M system is anticipated. The balance of the program effort will be expended

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on the production and delivery of operational units to Sandia. The balance of the 147 units will be manufactured in one lot with delivery scheduled for 4 March 1966.

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