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SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
1 st Review Date: <u>5/21/98</u>	Determination (Circle Number):
Authority: <u>W.C. Layne</u>	1. Classification Retained
2 nd Review Date: <u>5-26-98</u>	2. Classification Changed to: <u>UNCL</u>
Authority: <u>ADD</u>	3. Contains No DOE Classified Information
Name: <u>W.C. Layne</u>	4. Contains UCAF
	5. Contains UCAF
	6. Comment:
	<u>DECLASSIFY</u>

XW-49, 3-2
 Project No. T-16708
 Case No. 784.10
 Ref. Sym: 1613(130)

TO: DISTRIBUTION

Re: Rain and Salt Spray Test of MK-3/XW-49-X1, Unit "B"

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SEP 14 1965

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Summary of Test

Rain and salt spray tests, in accordance with SCS-5, were conducted consecutively on MK-3 re-entry vehicle/XW-49-X1, Unit "B", complete except for the flared skirt section. The tests were requested in a Work Order from J. Pruitt, 1245, to A. W. Reger, dated 11-19-59. Object of the test was to determine if moisture would penetrate the warhead thru the interface joint where the nose cone is mated and if corrosion would be a problem of importance.

During the rain test (2-hr. duration, 4 ± 1 inches rainfall per hour) water penetrated the warhead around the nose cone interface. Approximately 7/32 inch of water collected above the externally threaded ring (part No. 124141-01) between the forward polar cap and the section "B" case. During the salt spray test (50 hr. duration) water again collected in the forward end of the warhead. A post-mortem of the unit, after the tests, disclosed rust in the O-ring groove between the "A" and "B" warhead sections, and salt crystals on the forward end of the warhead. No other corrosion was evidenced.

Procedure and Results

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The re-entry vehicle, complete except for its flared skirt, was placed in a vertical position within the rain chamber (Fig. 1). A simulated skirt was used to support the unit, since vertical clearance within the chamber was inadequate to accommodate the complete re-entry vehicle.

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Instrumentation consisted of two Amisco relative humidity indicators, Type 8TM2, Serial Nos. 852 and 965, both mounted on the forward end of the warhead "A" section. These indicators were intended to detect penetration of water vapor in the nose cone.

The rain test was conducted first in accordance with SCS-5. After starting of the test, the relative humidity indicators showed an immediate, approximately linear rise in the relative humidity within the nose cone from 10% to 65% within the 2-hour duration. After termination of this test and removal of the nose cone, inspection revealed that water had collected around the forward end of section "A" of the warhead to a depth of 7/32 inch above the threaded ring (Part No. 124141-01).

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	above the threaded
	XW-49-X1
	3-2

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SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP	
CLASSIFICATION CHANGED TO: <u>U</u>	AUTHORITY: <u>W. C. Layne</u>
PERSON CHANGING MARKING & DATE: <u>Emelda Selph 5/28/98</u>	RECORD ID: <u>985W2121</u>
PERSON VERIFYING MARKING & DATE: <u>W.C. Layne 5/28/98</u>	DATED: <u>5/26/98</u>

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Distribution

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Project No. T-16708
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In preparation for the salt spray test, all moisture within the nose cone compartment was removed by blowing with compressed air and drying the internal area with heat lamps. The nose cone was re-installed, the unit placed in the chamber as in Fig. 1, and the salt spray test was begun (24 hours after termination of the rain test). The relative humidity indicators again indicated a fairly constant gradual rise, from 10% RH at the start to 70% RH at termination of the test.

Inspection following removal of the nose cone (about 3 hours after termination of the test) revealed droplets of water adhering to the front of section "A" and sour water collected around section "A" of the warhead. A post-mortem of the unit showed rust existing in the O-ring groove between the "A" and "B" warhead sections. Salt crystals were evident on the forward end of the warhead and on the inside surface of the nose cone. No other corrosion was noted.

Conclusions

Direct exposure of the unprotected re-entry vehicle to simulated rain or salt spray environment results in the collection of moisture within the nose cone area, with some associated rust and corrosion. Some method of moisture sealing is necessary at the interface between the nose cone and warhead.

J. M. Willson

1613 Project Engineer: G. M. WELLSUM - 1613-3

Approved by:

[Signature]
R. S. HOOPER - 1613-3

SMW:1613-3:cc

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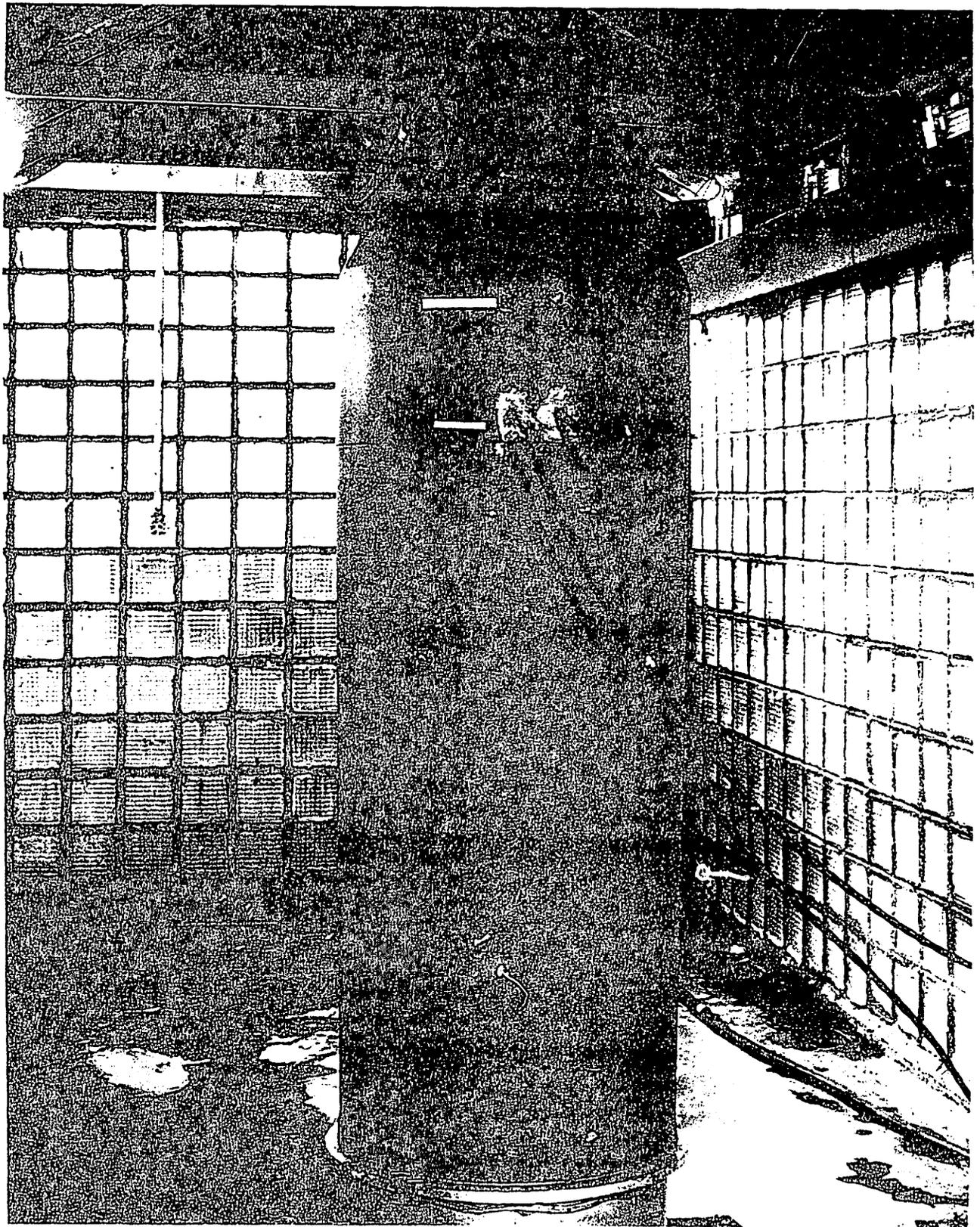


FIGURE 1 - MK-3 RE-ENTRY VEHICLE/ XW-49-X1 UNIT "B" IN THE RAIN CHAMBER FOR RAIN AND SALT SPRAY TESTS