Westinghouse Electric Corporation

Electronic Tube Division Box 284, Elmira, New York 14902

TEST REPORT ON INCIDENT TESTING OF TRIAX PENETRATION

Purpose

Conduct steam incident and helium leak detector test on a representative sample triax conductor.

Product

Sample constructed as per drawing E2209.

Conclusion

The triax conductor withstood a "once in a lifetime" steam incident test without loss of leak tightness. The amphenol cable, #21-529 did not survive as the center wire migrated to a point where it almost touched the first shield. The first shield shorted to the second shield. Thus, seal integrity was maintained but operability was not.

Procedure

A triax conductor was welded to a plate and mounted to a steam pressure vessel as shown in Figure 1. Steam pressure was then applied approximating conditions specified in SK#1 and SK#2. Note that the maximum pressure specified by SK#1 is 50% above the design basis event pressure and SK#2 specified a temperature 37°F above the DBE temperature.

Leak integrity was checked before and after.

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PDR ADOCK 05000327
P PDR

Test Data

Steam Test

Elapsed Time	Steam Pressure	Chamber Temp.	Temp. of Feed Through It. 5 Dwg. E2209
1 1/2 min	90 PSIG	323°F	77°F
60 min	90 PSIG	323°F	87°F
67 min	60 PSIG	303°F	82°F
3 hrs	60 PSIG	303°F	82°F
26 hrs	20 PSIG	248°F	82°F

Helium Leak Detector Test

There was no detectable leak either before or after the test. Minimum detectable leak rate was 10^{-10} std cc/sec for the Veeco MS90 leak detector used.

Insulation Resistance Test

	Before Incident	After Incident
Center Conductor to First Shield	2×10^{14} ohms	350 K ohms
#1 Shield to #2 Shield	1×10^{13}	1 ohm
#2 Shield to Ground	1×10^{10}	10^{10} ohms

Discussion

It was not possible to achieve the 90 PSIG in ten seconds as required, but it is felt that having achieved it in one and one-half minutes was adequate since the design is not sensitive to shock caused by the fast heating rate.

The seal is so far from the heat generation face that very little temperature rise was experienced at this critical area. The integrity of the seal was thus assured.

Since the cable is polyethylene with a softening point of 180 - 255°F, it is no surprise that shorting took place between shields and between the center conductor and shields.

The physical nature of the cable changed from flexible to very stiff after exposure.

It is evident from this test that triax penetrations will not be operable after exposure to the conditions specified (90 PSIG and 318°F). Seal integrity, however, was maintained thus proving the design adequacy.

R. L. Korner

Test Performed by R. L. Korner

W. C. Morley

Witnessed By

11-14-69

Date

Quality Assurance

R. A. Pugsley 11/18/69

Approved By

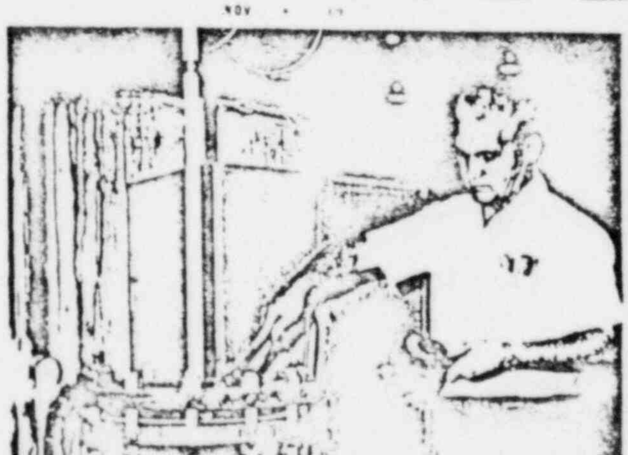

FIGURE 1

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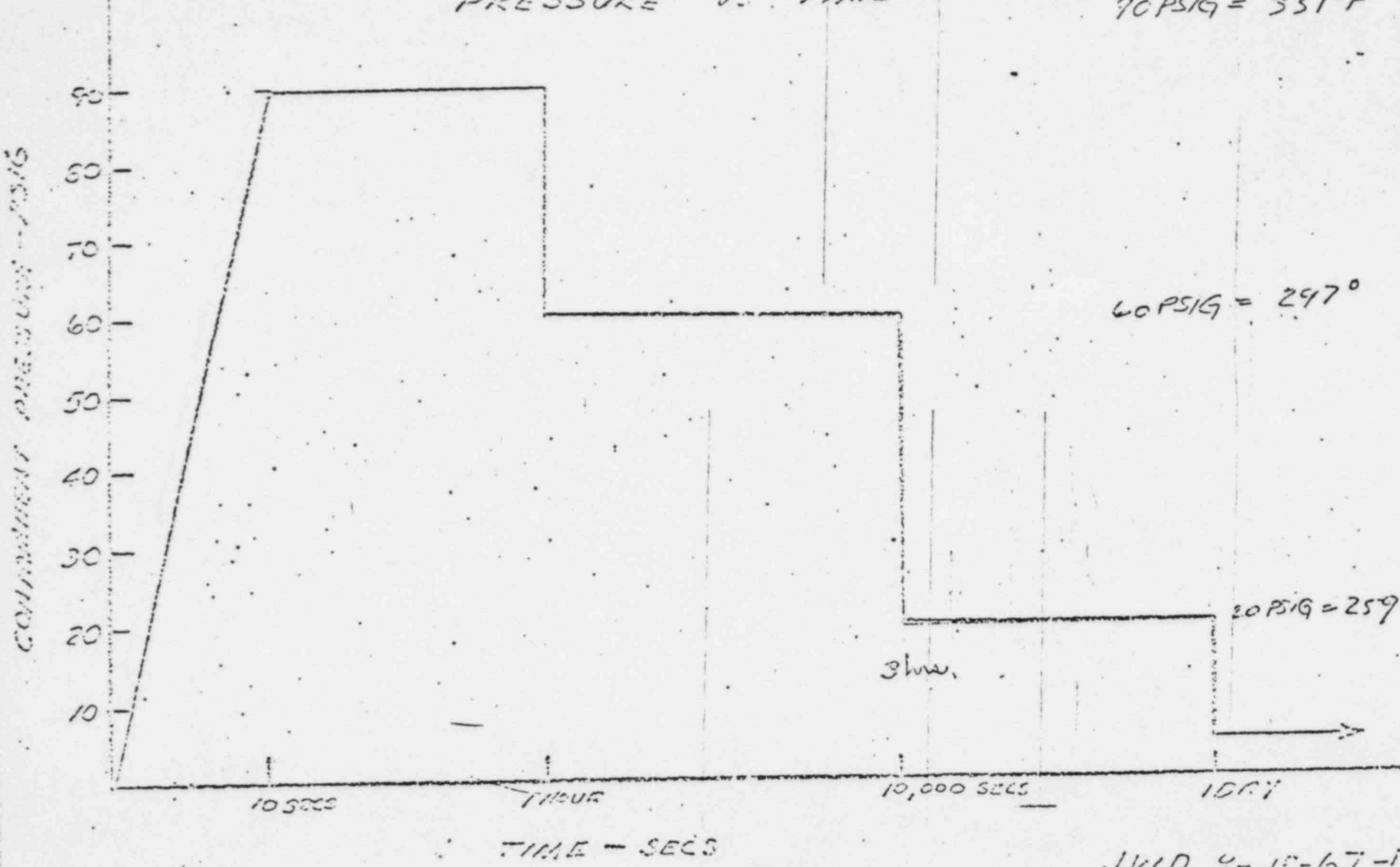
RSE/WEP CONTAINMENT ENVIRONMENTAL
CONDITIONS FOR EQUIPMENT DESIGN
PRESSURE VS TIME



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SK # 1

SKETCH SHEET
FORM 25577

Spec. 6118-E-29, Rev.

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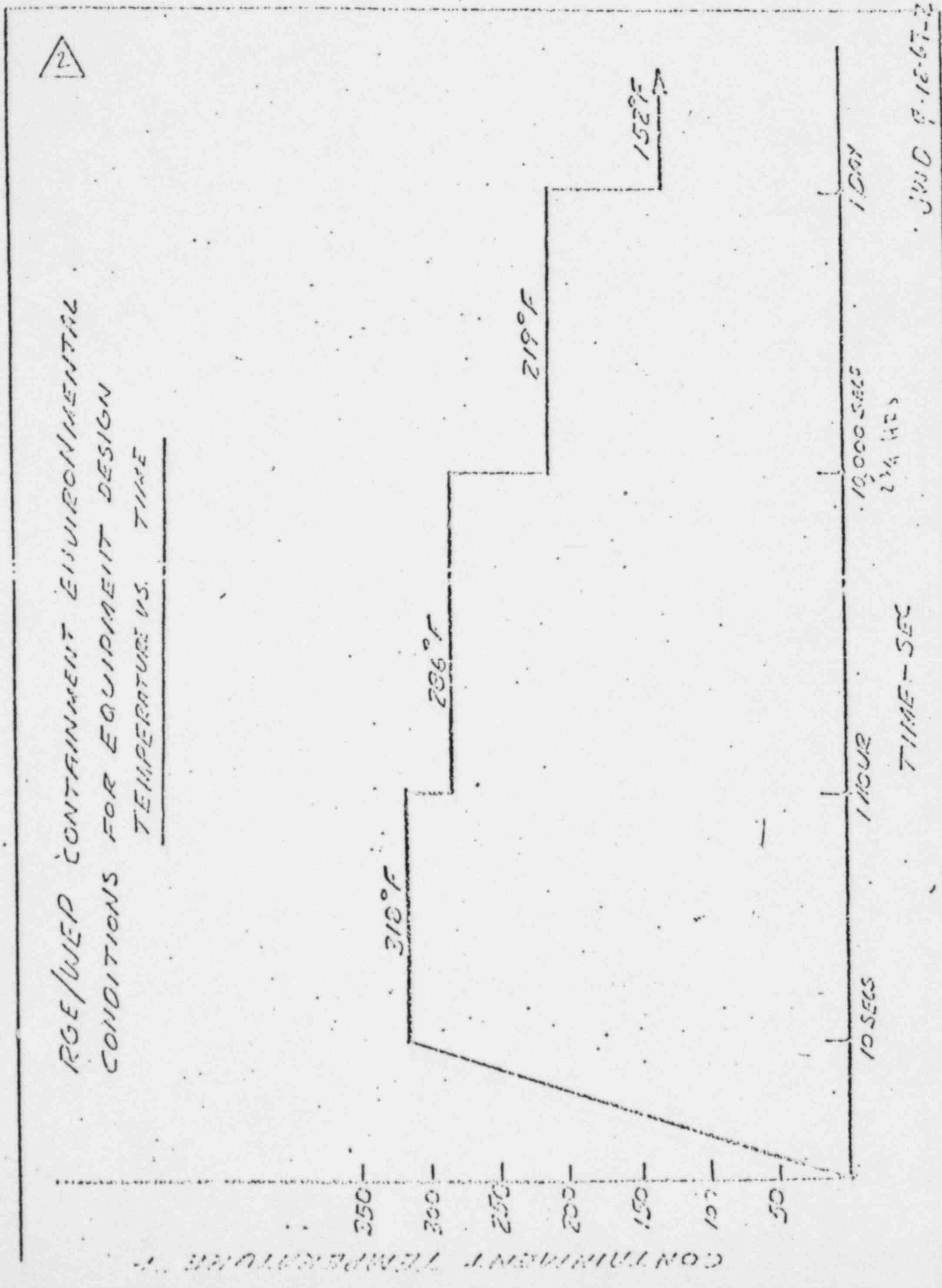

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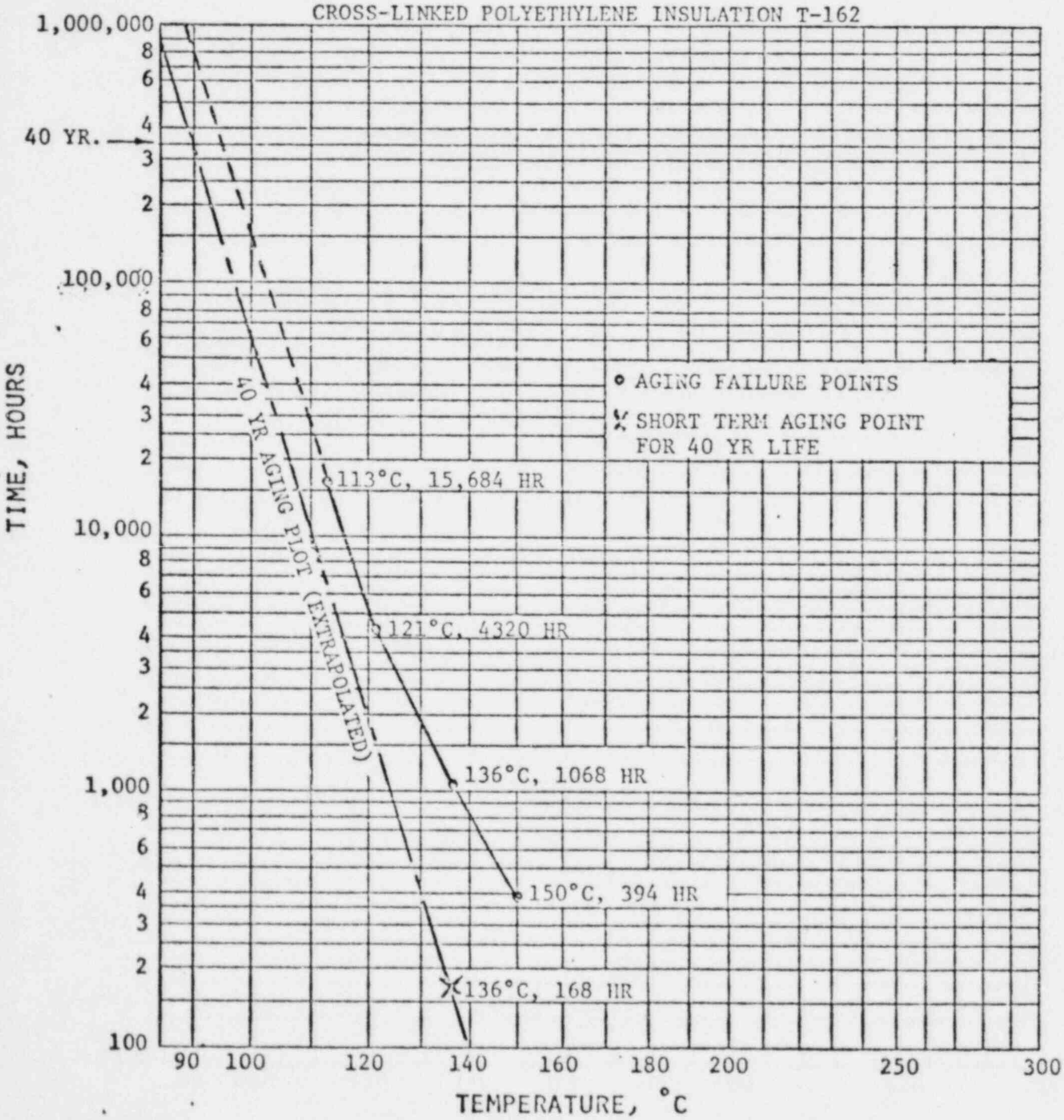
40 YEAR LIFE

CROSS-LINKED POLYETHYLENE INSULATION T-162



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