



16 June 1992

RUBIN FELDMAN, P.E.
President

U S Nuclear Regulatory Commission
Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Attention: Mr. Ashok C. Thadani, Director
Division of Systems Technology
Office of Nuclear Reactor Regulation

Dear Mr. Thadani:

The NRC has previously received communications from Thermal Science, Inc. relating to fire resistive testing of the THERMO-LAG 330 Fire Barrier System applied to 36 inch wide, open top, ladder back cable trays and 3/4 inch diameter conduits.

We are pleased to inform you that on Tuesday, June 9, 1992, a very successful one hour fire resistive and water hose stream test was completed at the independent fire test facilities of Omega Point Laboratory in San Antonio, Texas. The one hour ASTM E119 fire simulation was followed by a 2-1/2 minute water hose stream exposure. Only generic cables were used. The cable tray contained one row of randomly spaced #12/7, #16/2 and 300 MCM cables. This was the first of several planned formal tests.

The following fire barrier materials were used:

For the Cable Tray, Junction Boxes and Condulets:

- THERMO-LAG 330 Prefabricated Panels - 0.625" \pm 0.125" nominal thickness
- THERMO-LAG 330-1 Subliming Trowel Grade Material
- Stainless Steel Banding Material
- Stainless Steel Tie Wire

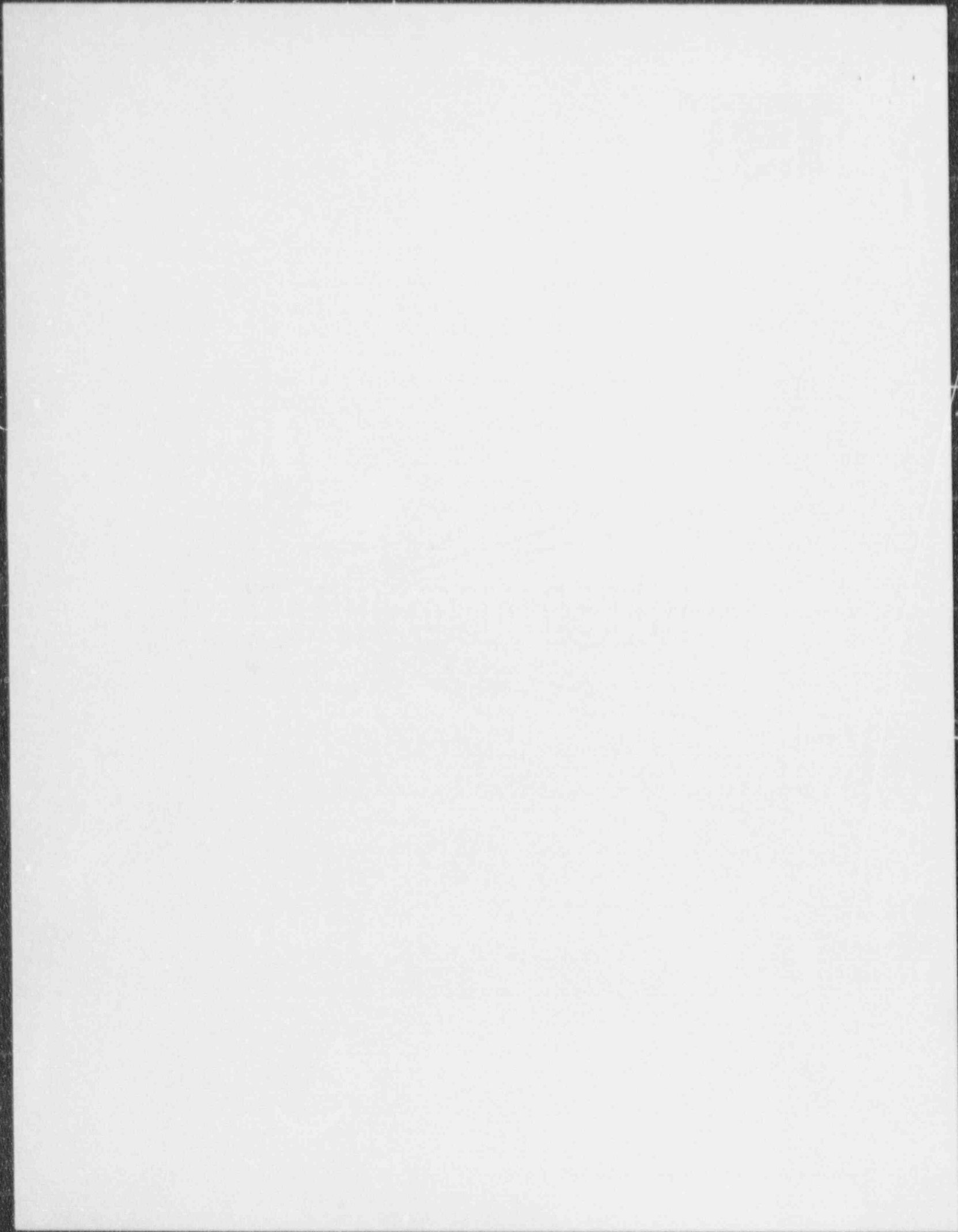
For Conduits:

- THERMO-LAG 330 Preshaped Conduit Sections - 0.625" \pm 0.125" nominal thickness
- THERMO-LAG 330-1 Subliming Trowel Grade Material
- Stainless Steel Banding Material

THERMAL SCIENCE, INC. • 2200 CASSENS DR. • ST. LOUIS, MO 63026 • (314) 349-1233

Telex: Domestic 44-2384 • Overseas 209901 • Telecopier (314) 349-1207

9206290166 920622
PDR ADOCK 05000445
F PDR



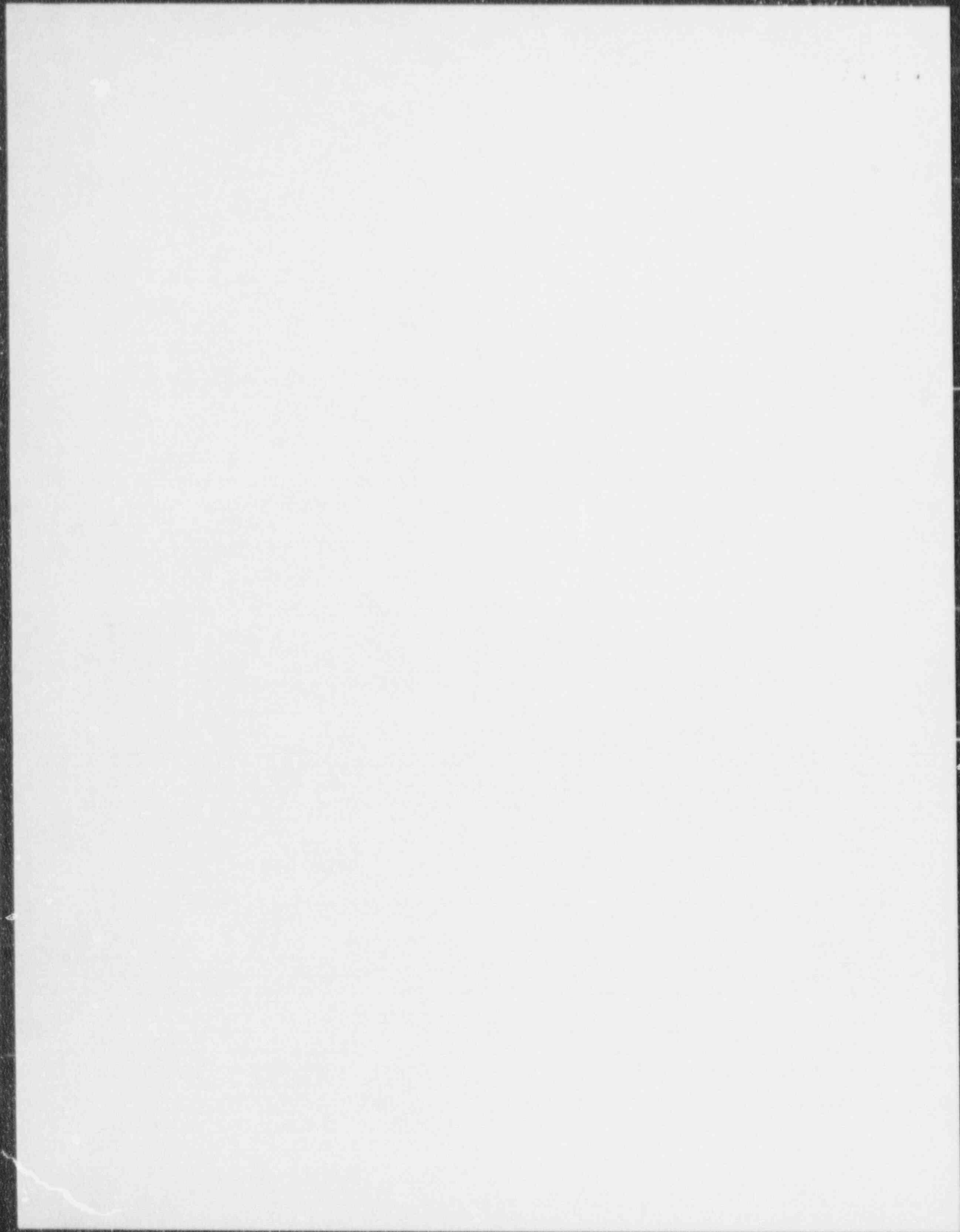
The following are the highlights of this test:

- Electrical integrity was maintained throughout the fire endurance and water hose stream exposures.
- Cable Tray Test Assembly - The maximum and average temperatures are shown in Figures 1 through 4 enclosed herein.
- Conduit Assembly - The maximum and average temperatures are shown in Figure 5. This is a TSI plot of the Omega Point developed and provided data. We have eliminated one malfunctioning thermocouple from this plot.
- Following the completion of the fire endurance and water hose stream test, portions of the THERMO-LAG wrap were removed from the test articles, with the following results:
 - The cables exhibited no damage whatsoever and were intact and flexible.
 - The nylon ties exhibited no damage and were flexible.
 - The paint on the junction boxes was intact and retained its gloss.
 - A definable thickness of THERMO-LAG 330 was present on the stress skin which was not damaged.

The test program, which is currently continuing with other planned tests, is under the total control of Omega Point Laboratory and includes:

- The construction of the test articles,
- The installation of the fire barrier system materials,
- Test article instrumentation,
- The performance of the fire endurance and water hose stream tests.
- The performance electrical circuitry integrity monitoring,
- All pertinent Quality Control Documentation

Omega Point Laboratory will publish the test reports.



The tests are being conducted in accordance with the applicable prerequisites of:

Test Plan No. 31192-A Engineering Test Plan to Perform One Hour Fire Endurance Tests Followed by Water Hose Stream Tests On a 36 Inch Wide Steel Open Top, Ladder Back Cable Tray (With One Layer Of Generic Cables) and Steel Conduit Test Articles Protected With The THERMO-LAG 330 Fire Barrier System

ANI's Bulletin B.7.2, 11/87 "ANI/MAERP RA Guidelines For Fire Stop and Wrap Systems At Nuclear Facilities - Attachment B, Standard Fire Endurance Test Method To Qualify A Protective Envelope For Class IEEE Electrical Circuits", Revision I, dated November 1987, as applicable

U S Nuclear Regulatory Commission's Generic Letter 86-10
To All Power Reactor Licensees And Applicants For Power Reactor Licenses, dated 24 April 1986 "Implementation Of Fire Protection Requirements", as applicable

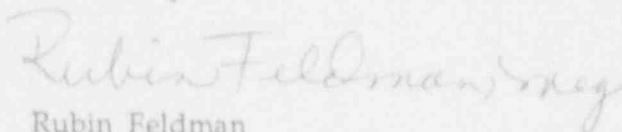
ASTM E119 (88) "Standard Methods of Fire Tests of Building Construction and Materials", as applicable

The planned details of construction are contained in the above referenced test plan. The final laboratory report, of course, is expected to provide the step by step details of what and how it was done.

The information presented herein is preliminary. It may be modified by the laboratory in its final report. Please contact this office if you have any questions.

We look forward to a continuing association.

Yours truly,



Rubin Feldman
President

RAL/meg
Enclosures

FIGURE 1

Project No. 93600
Thermal Science, Inc
Furnace Interior Temperature

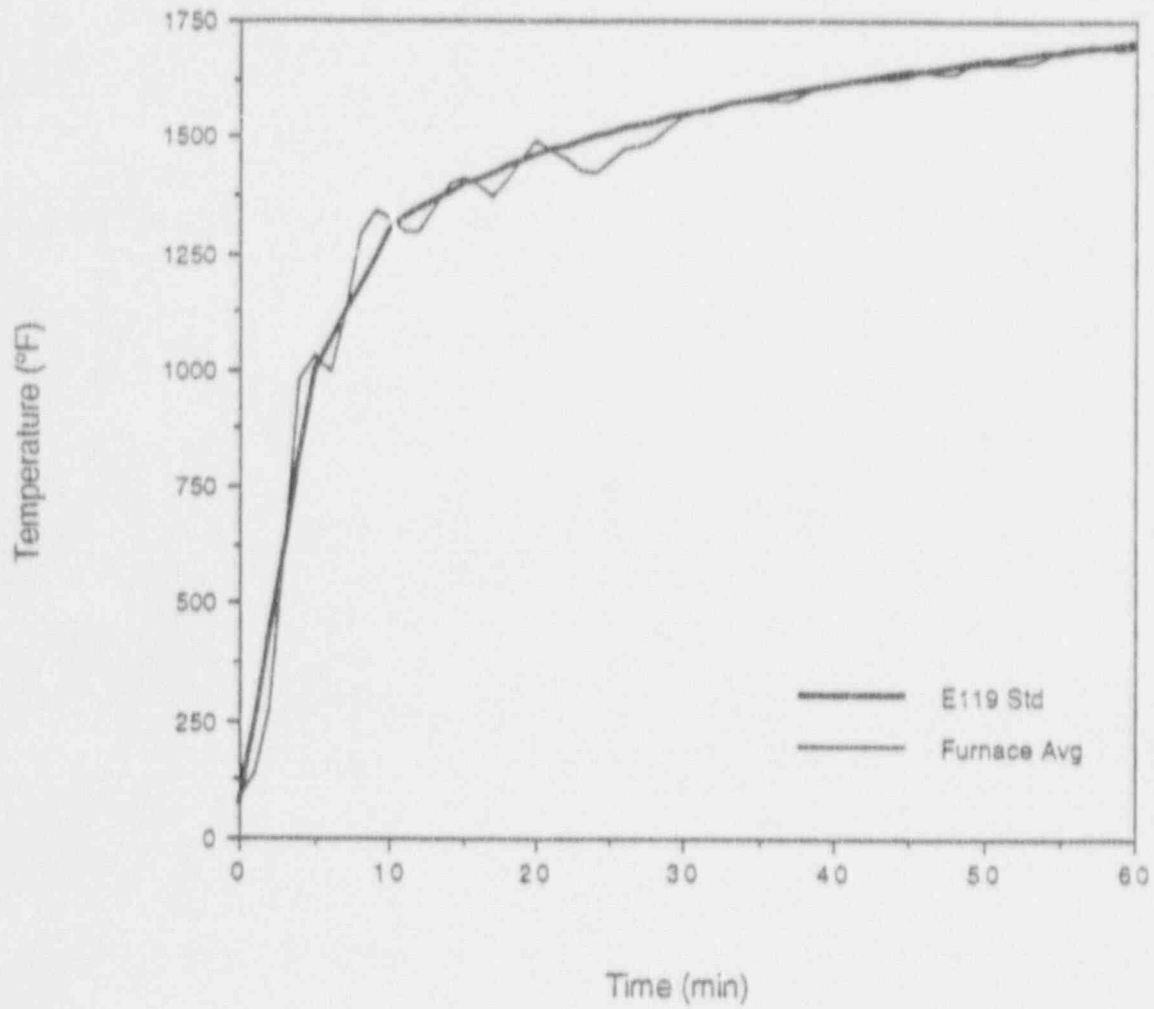


FIGURE 2

Project No. 93600
Thermal Science, Inc.
TRAY - 7C/#12 AWG Temperatures

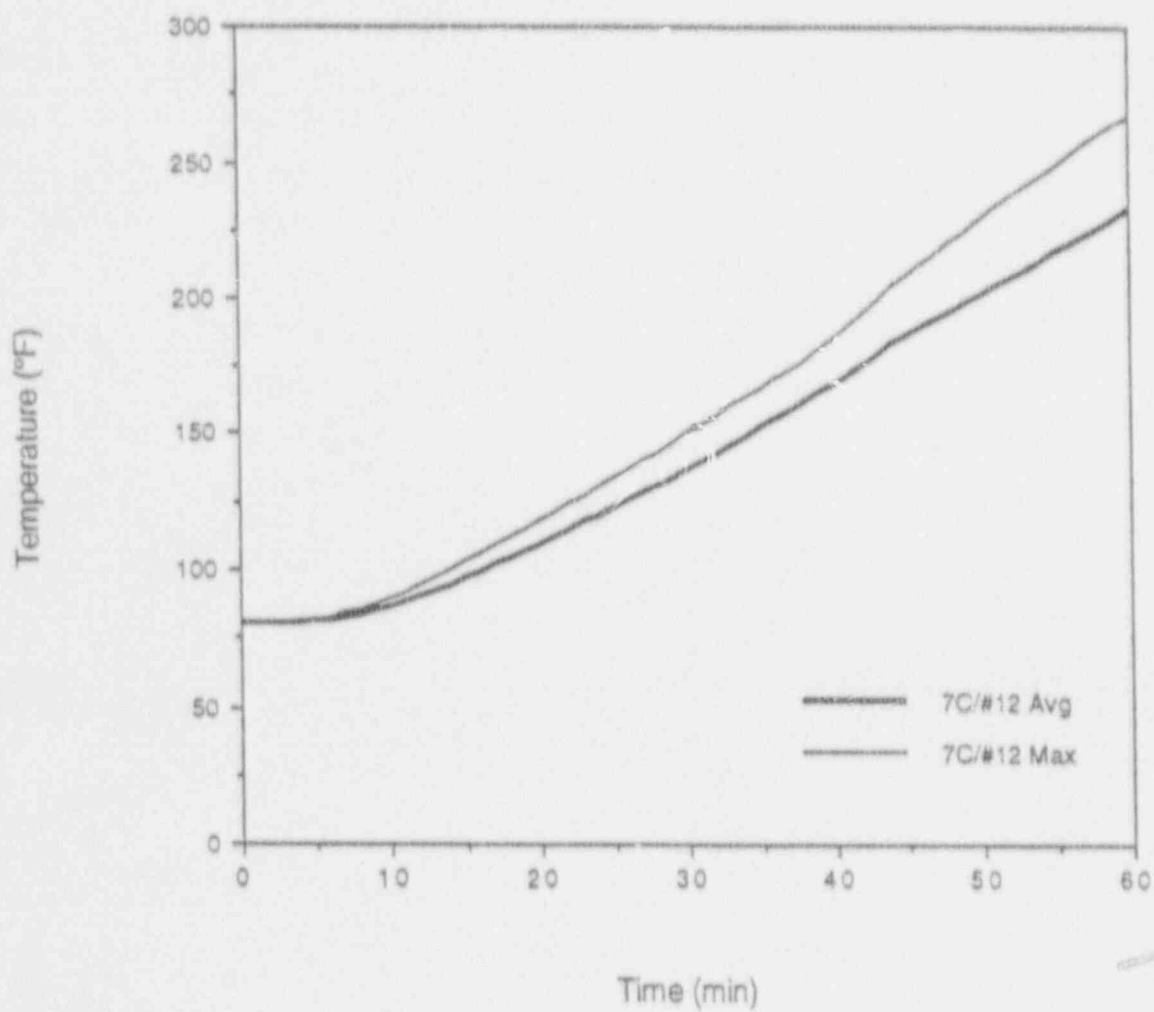


FIGURE 3

Project No. 93600
Thermal Science, Inc.
TRAY - 2C/#16 AWG Temperatures

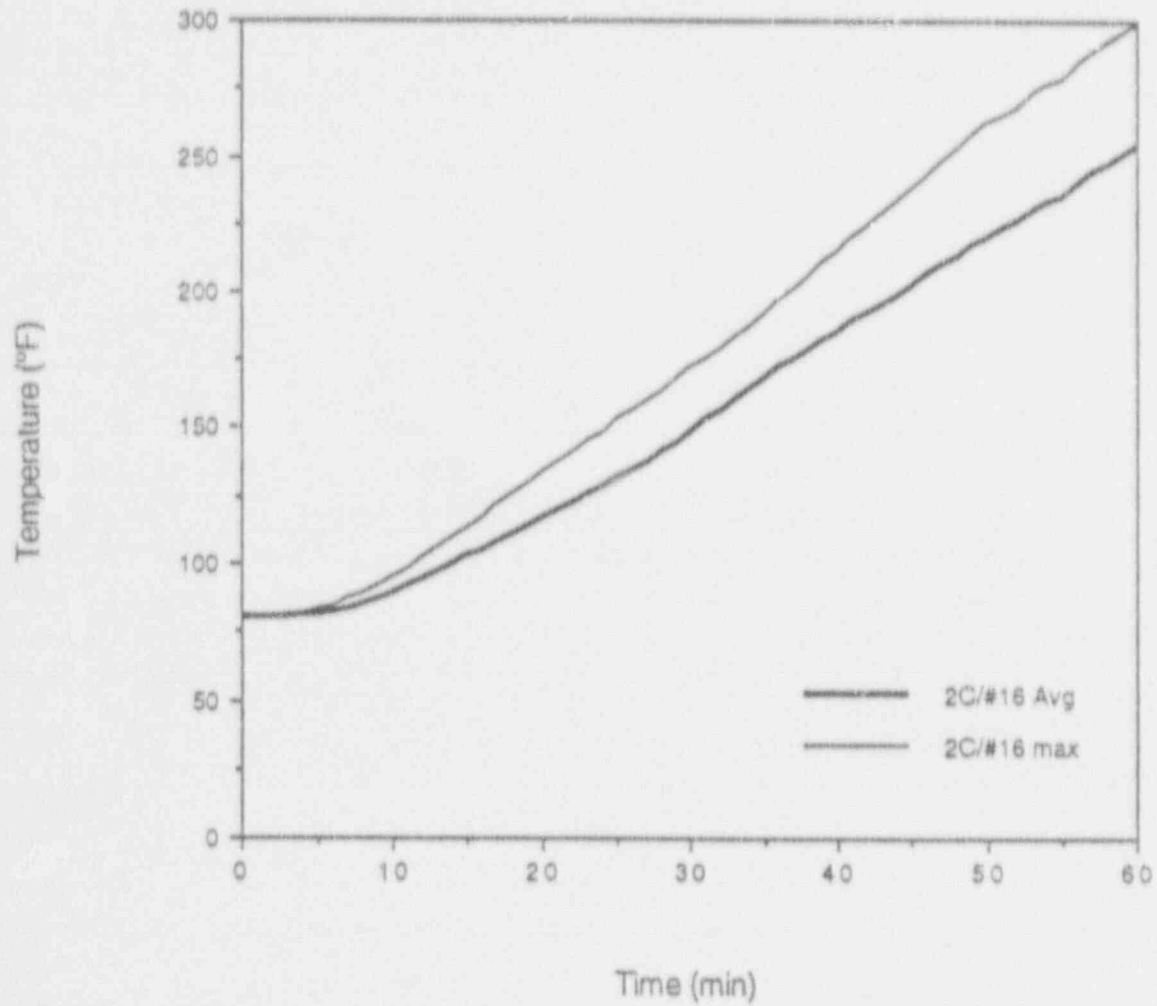


FIGURE 4

Project No. 93600
Thermal Science, Inc.
TRAY - 300 MCM Temperatures

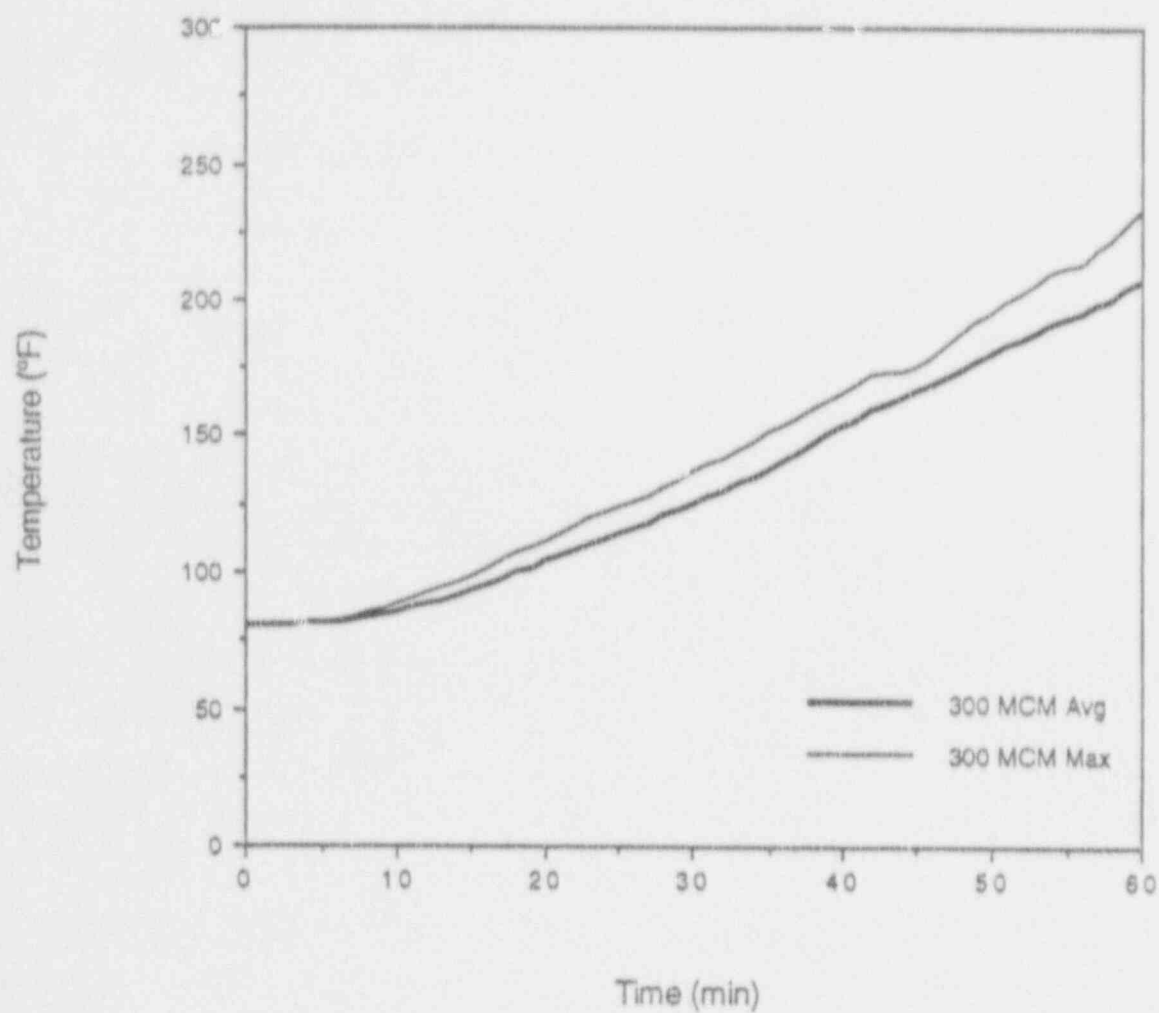
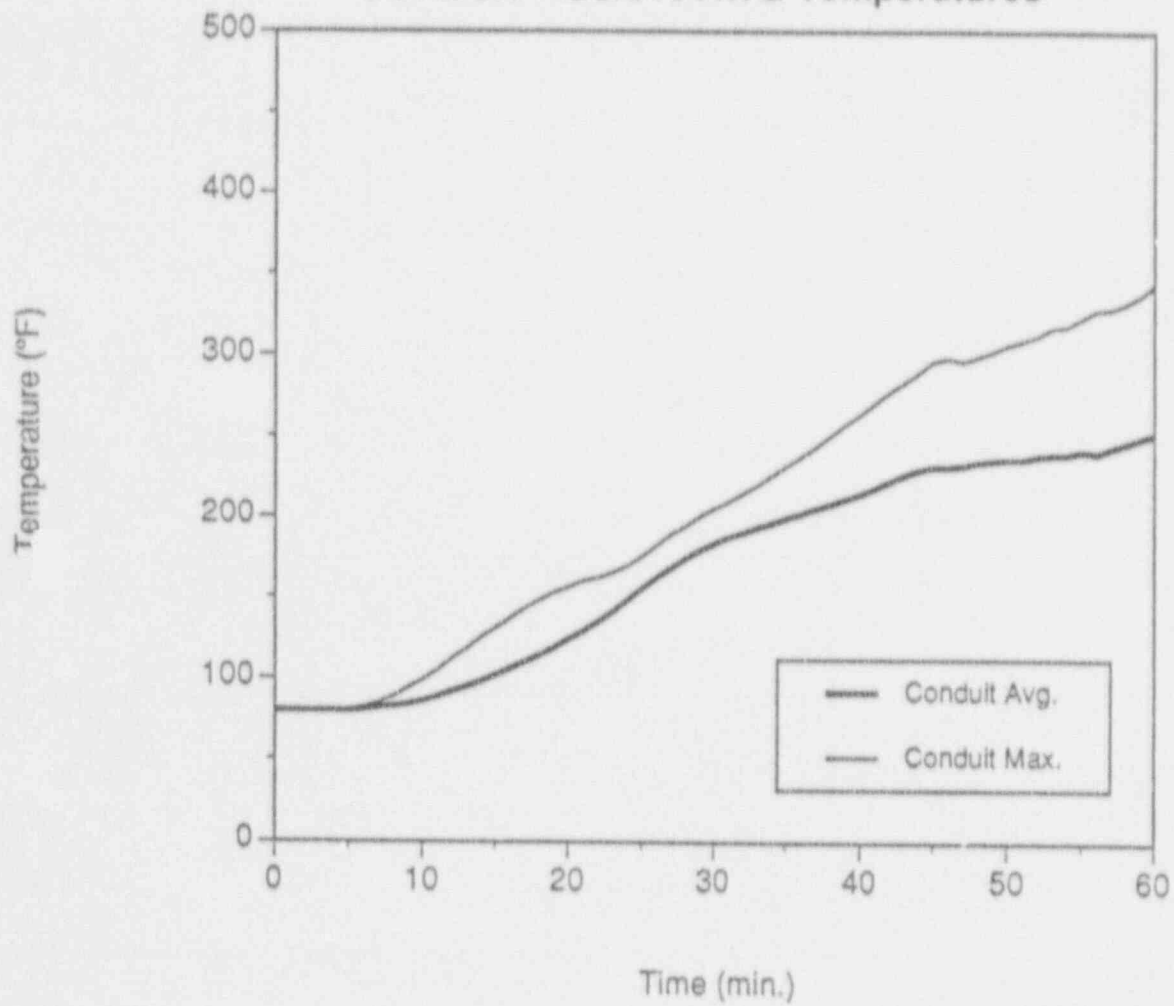
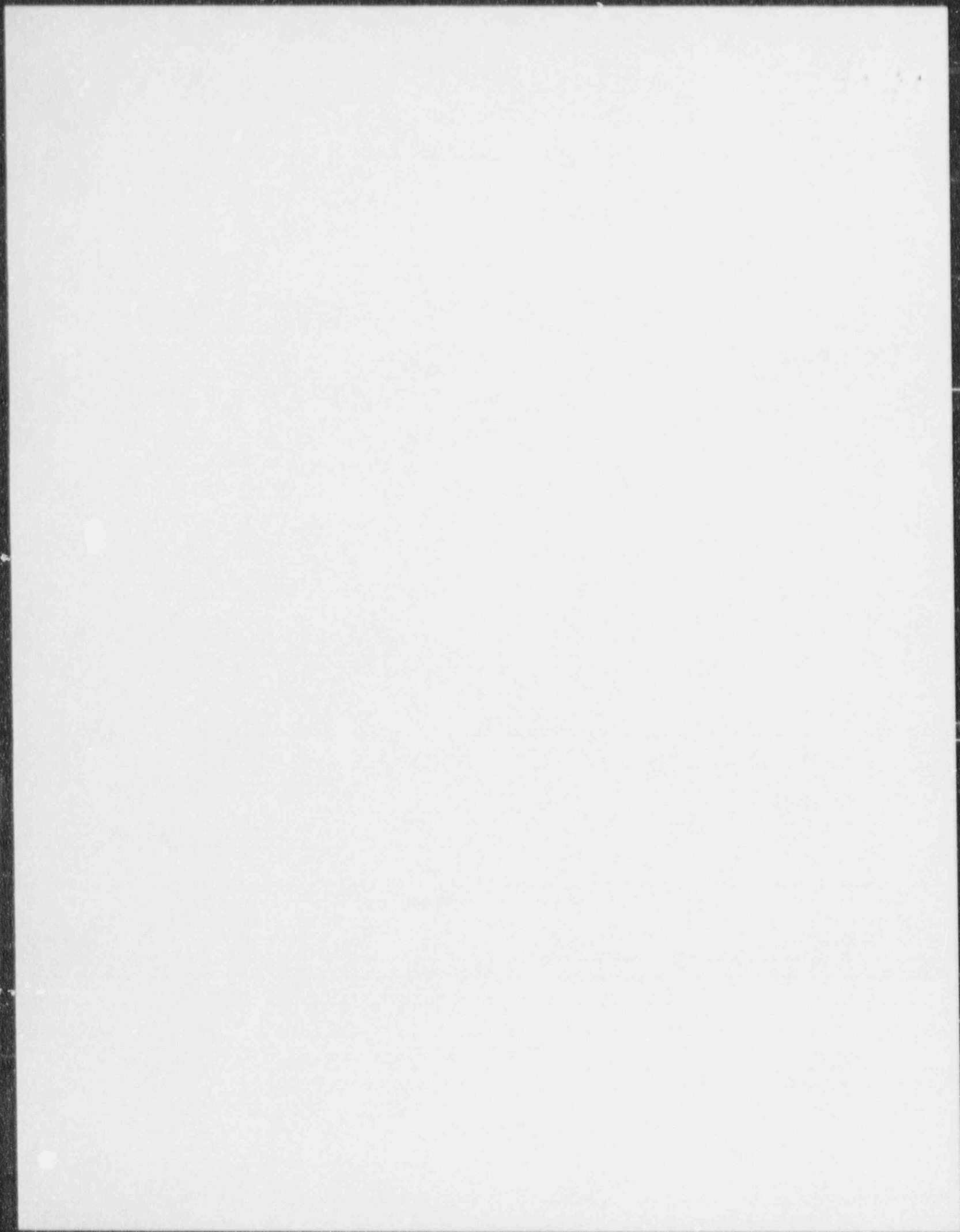


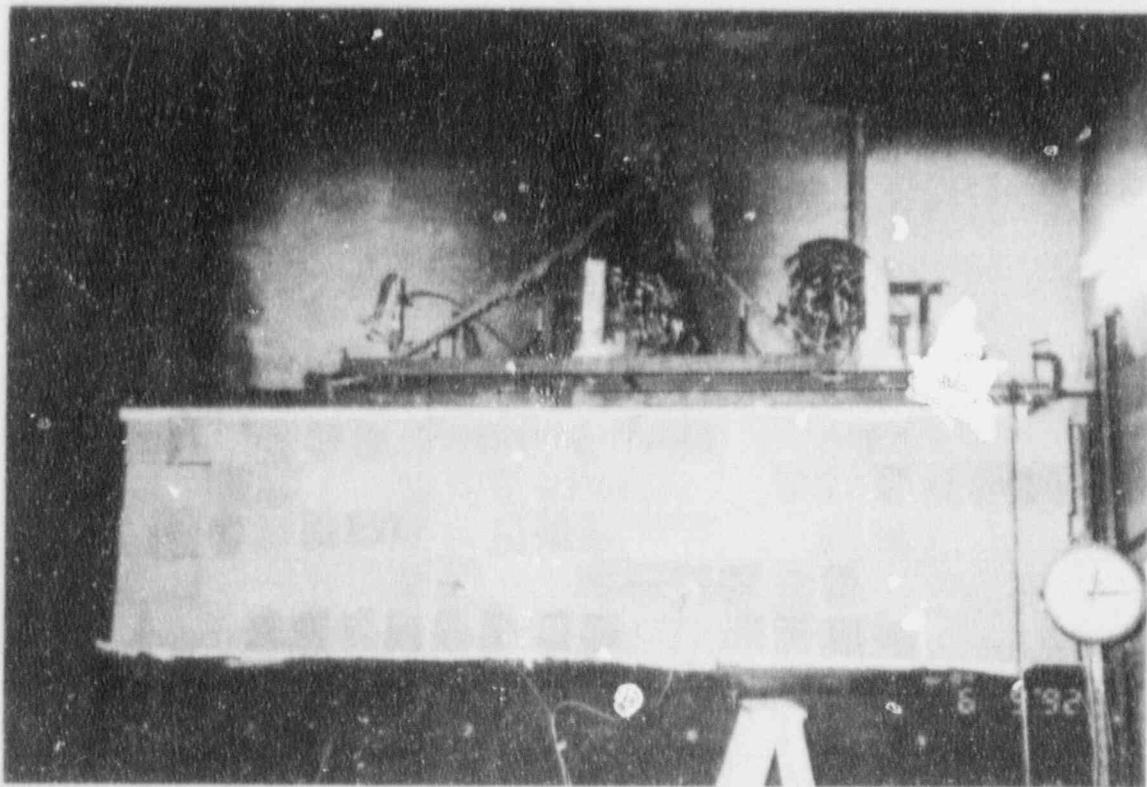
FIGURE 5

Project No. 93600
Thermal Science, Inc.
CONDUIT - 2C/#16 AWG Temperatures



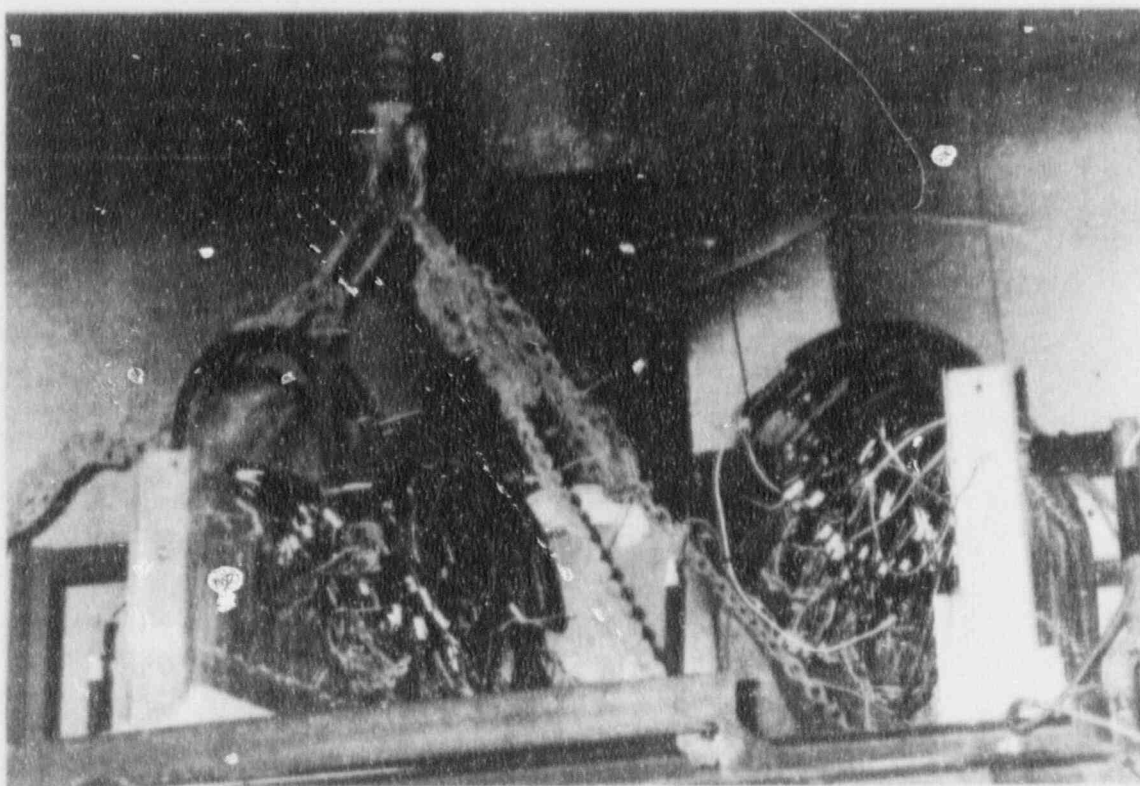
TSI Data Reduction





6-9-92

TSI 8



6-9-92

T-21



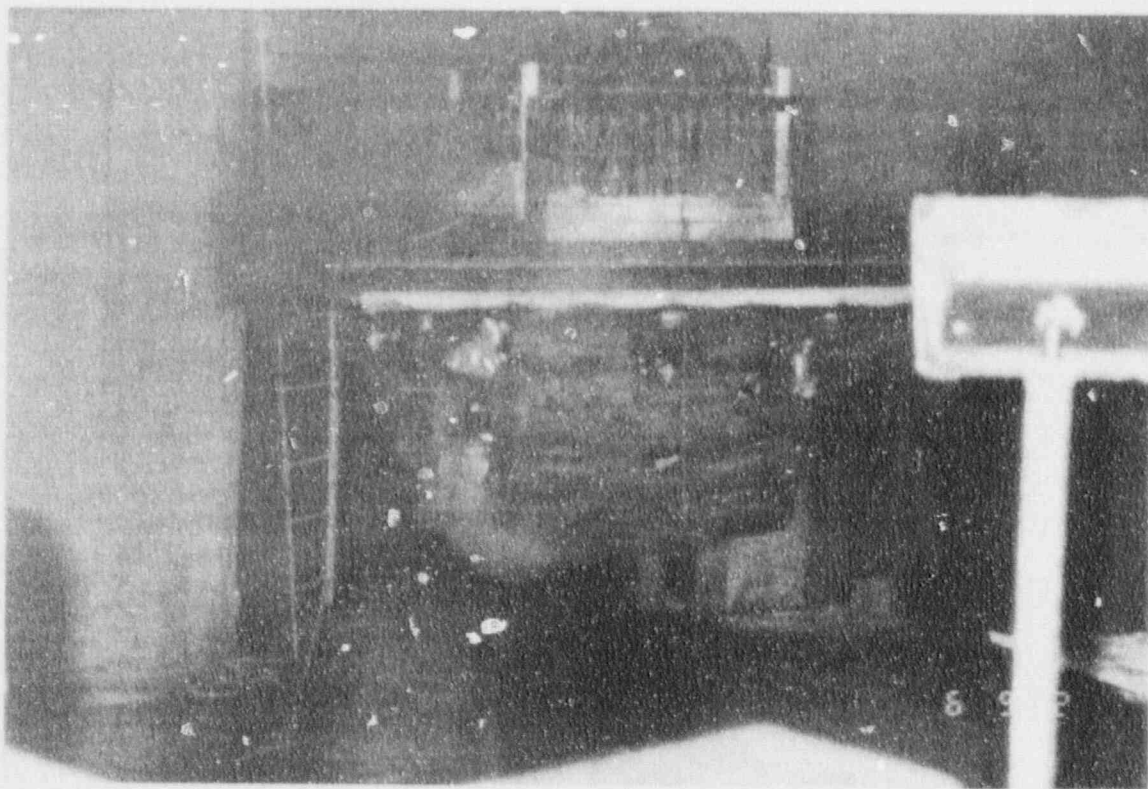
6-9-92

TST 10



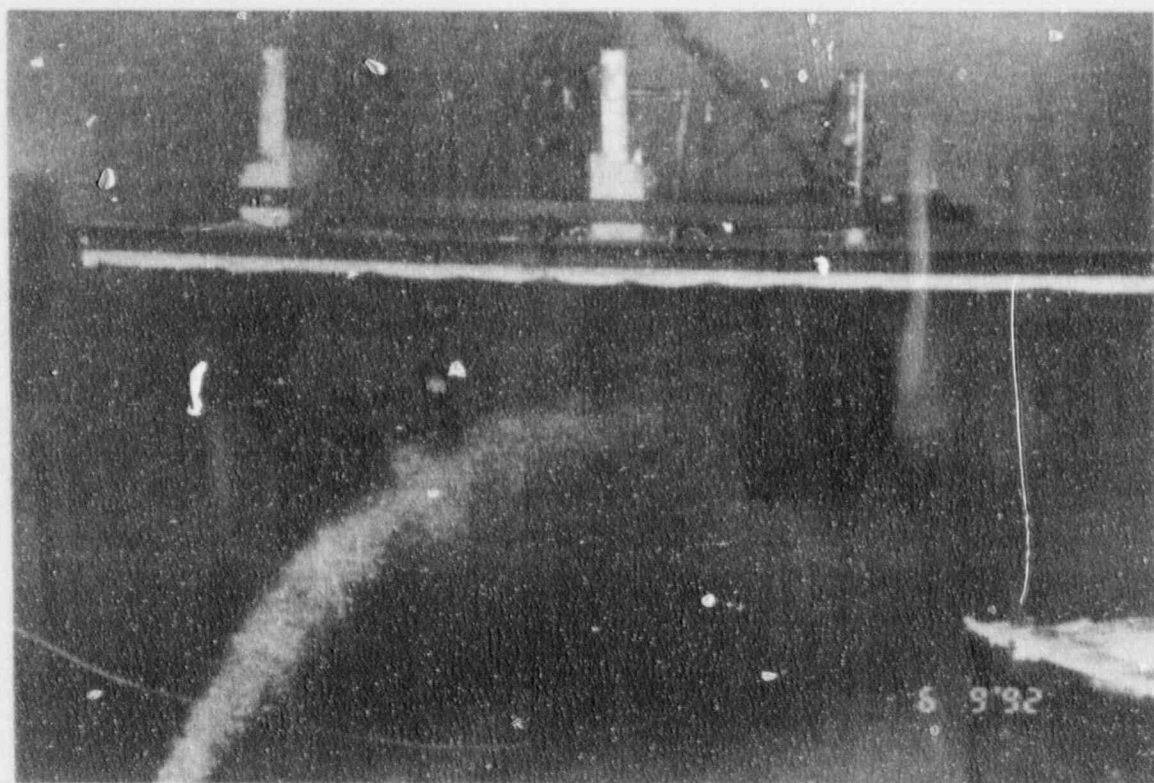
6-9-92

TST II



6-9-92

TSJ12



6 9'92

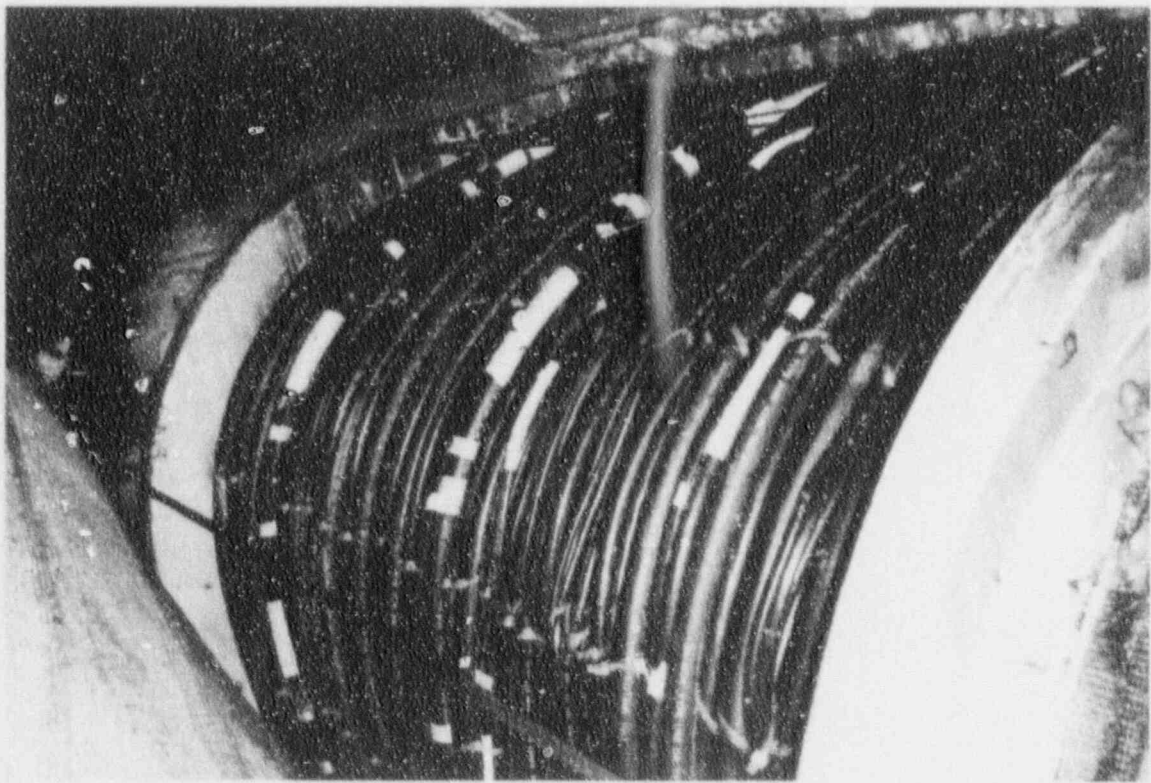
G. 9. 92

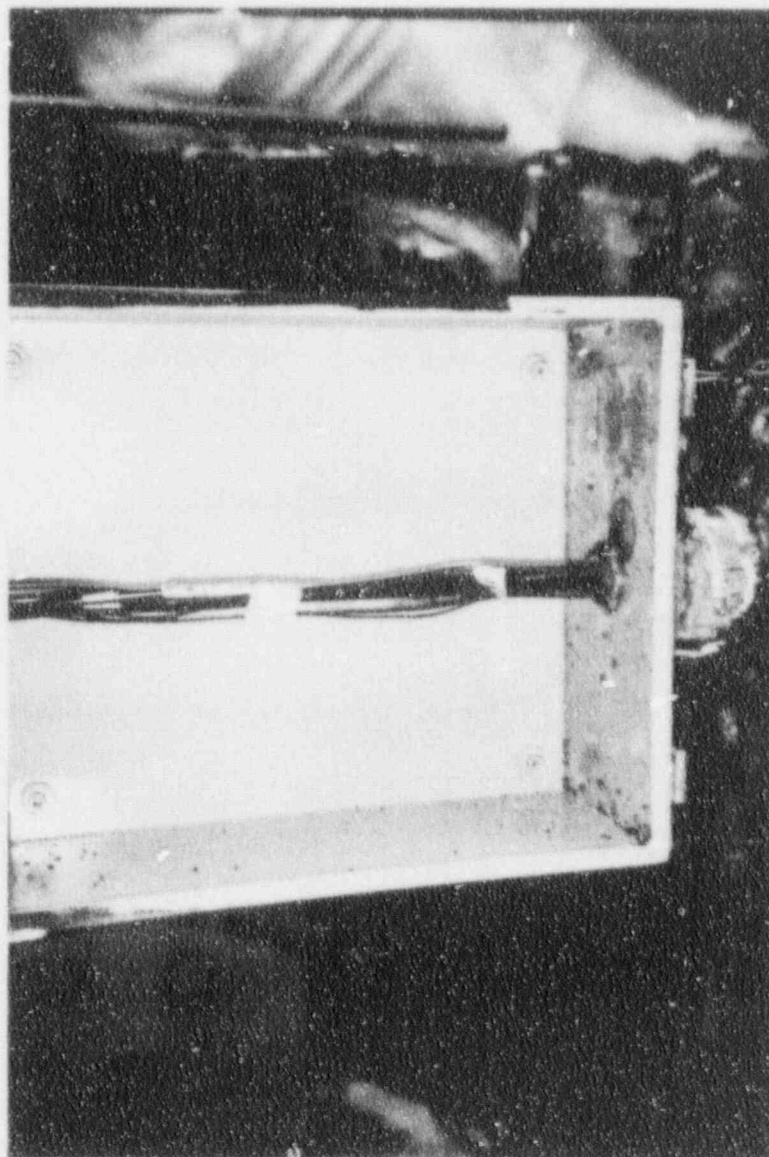
TSI 13

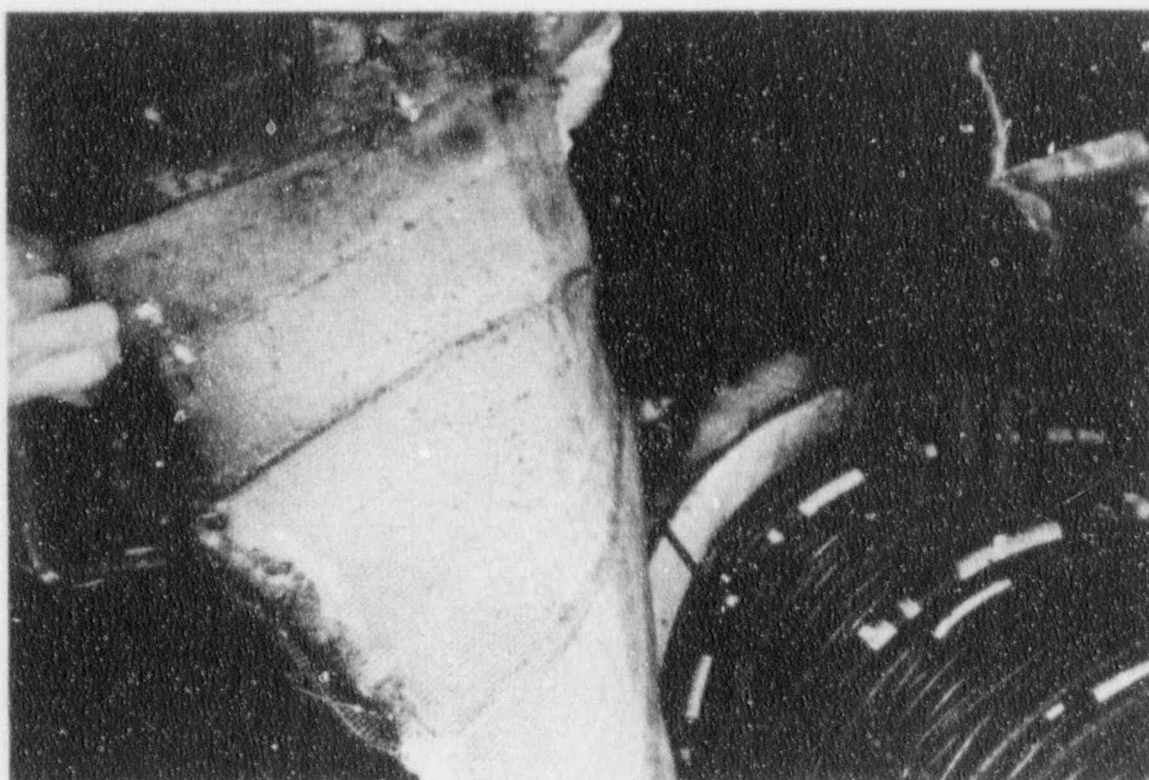


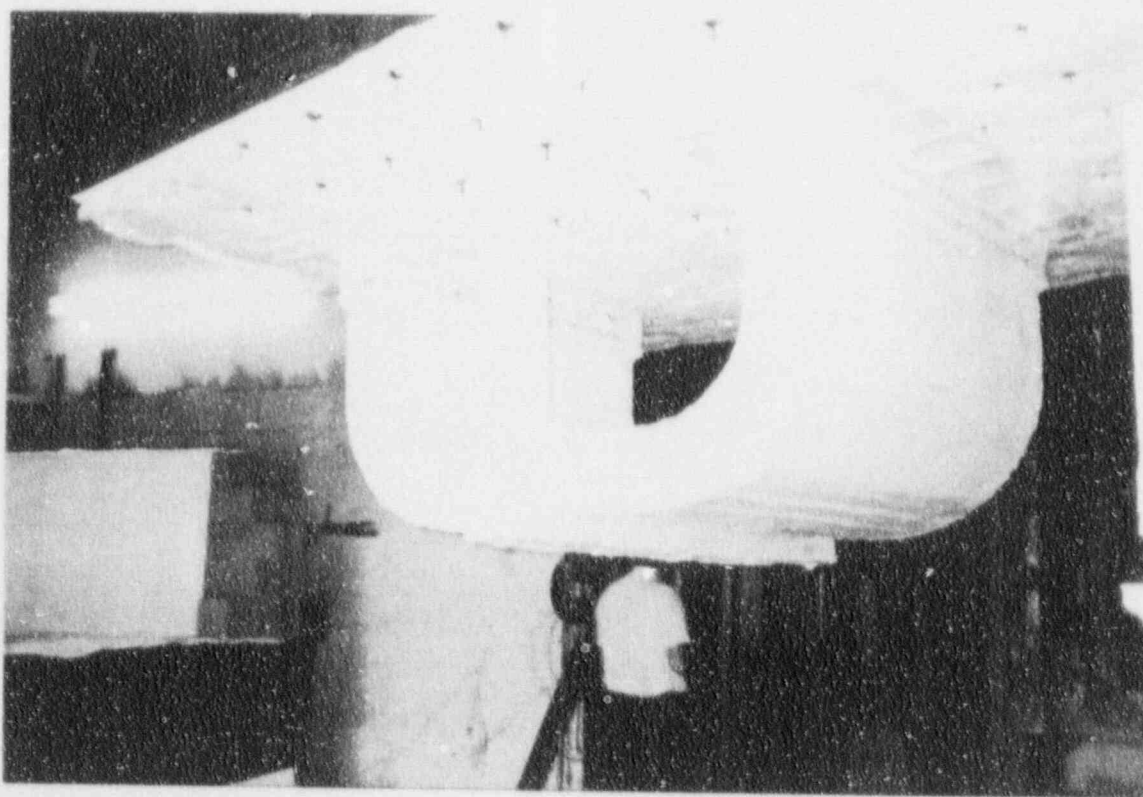
6.9-92

TST 14



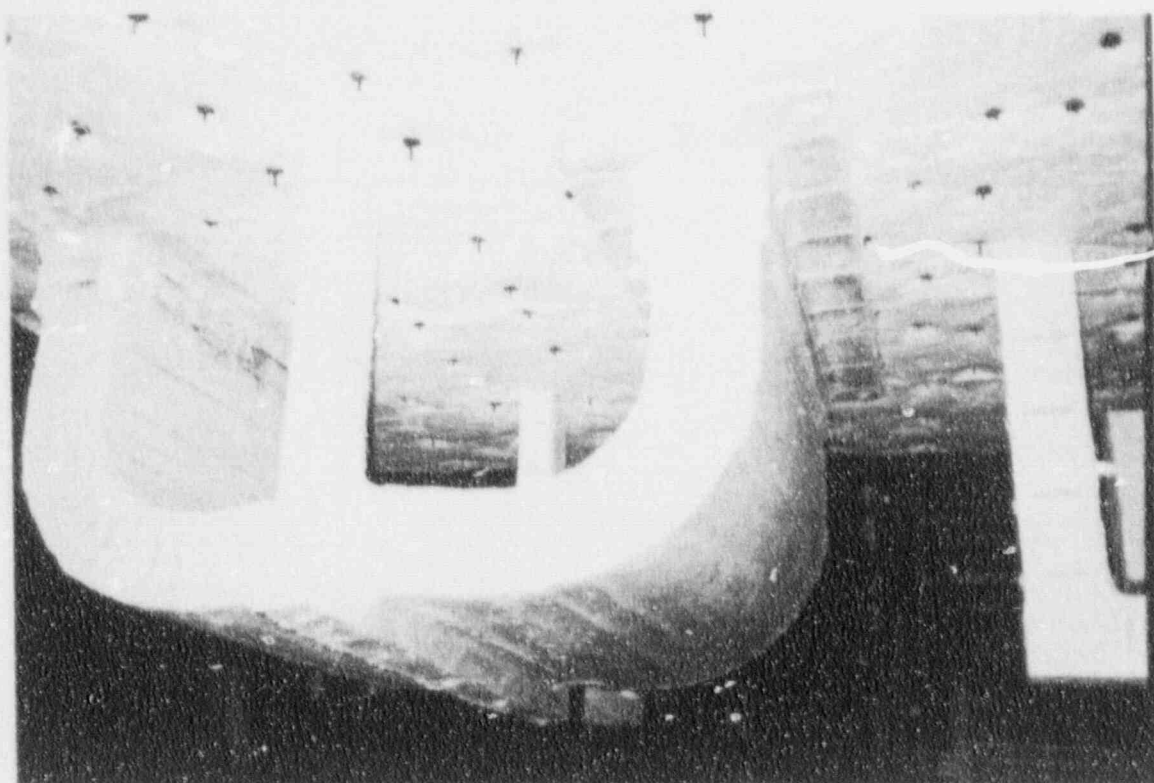






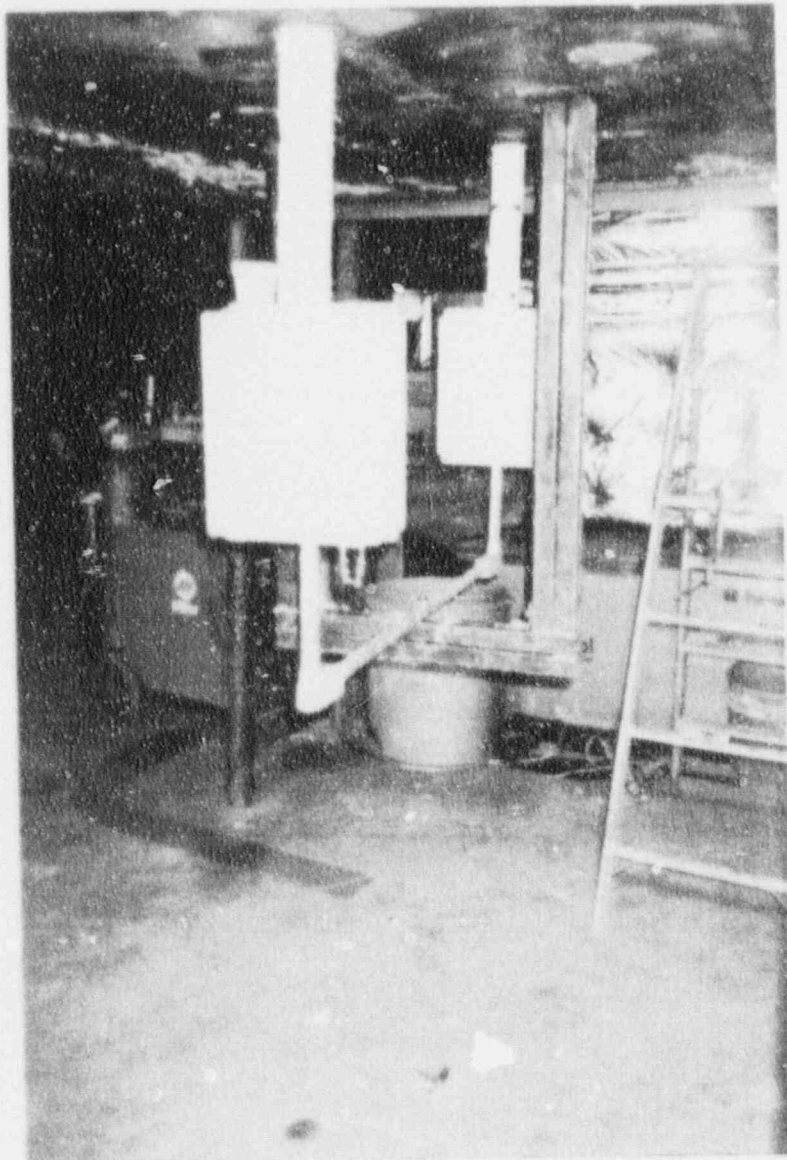
6-9-92

TSI 1



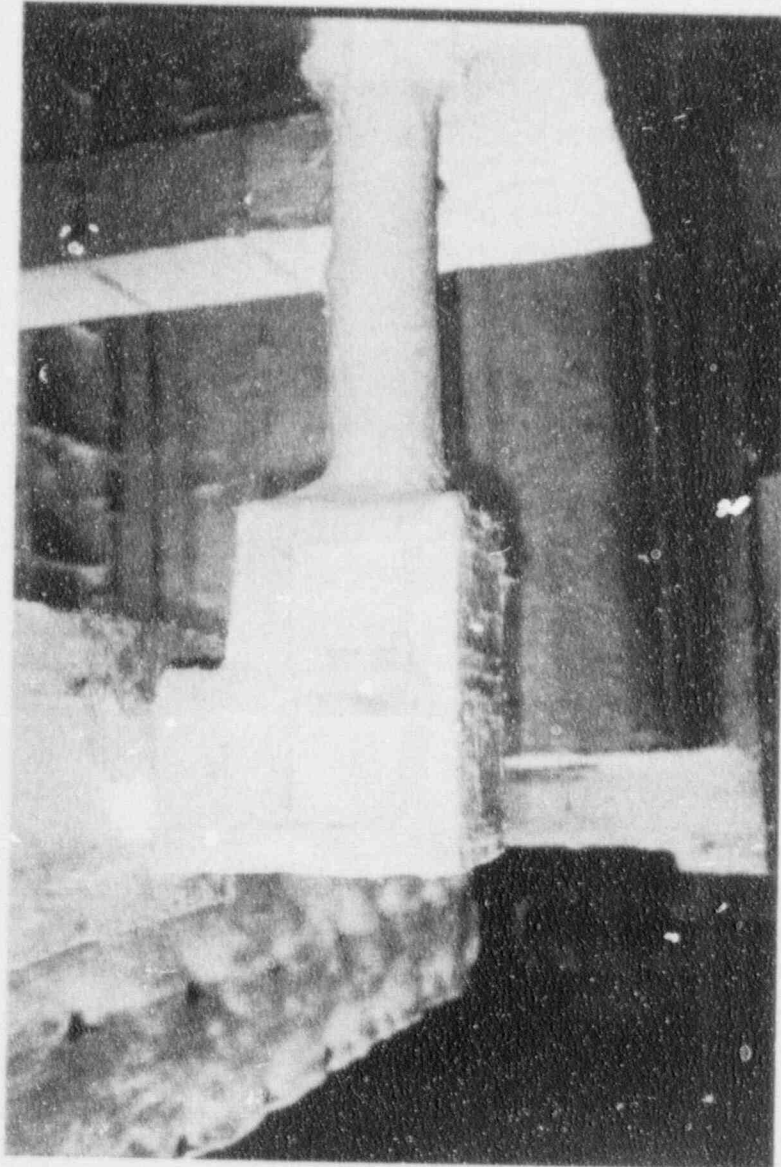
6-9-92

TSI 2



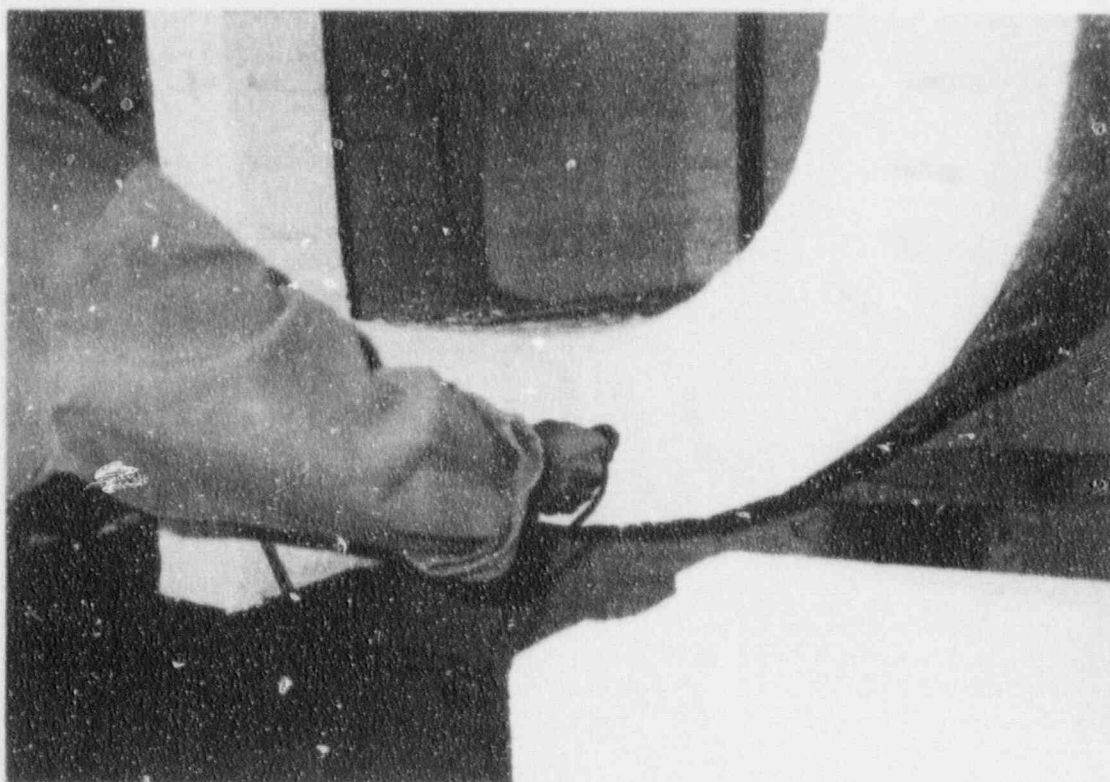
6-9-92

TSI 3



6-9-92

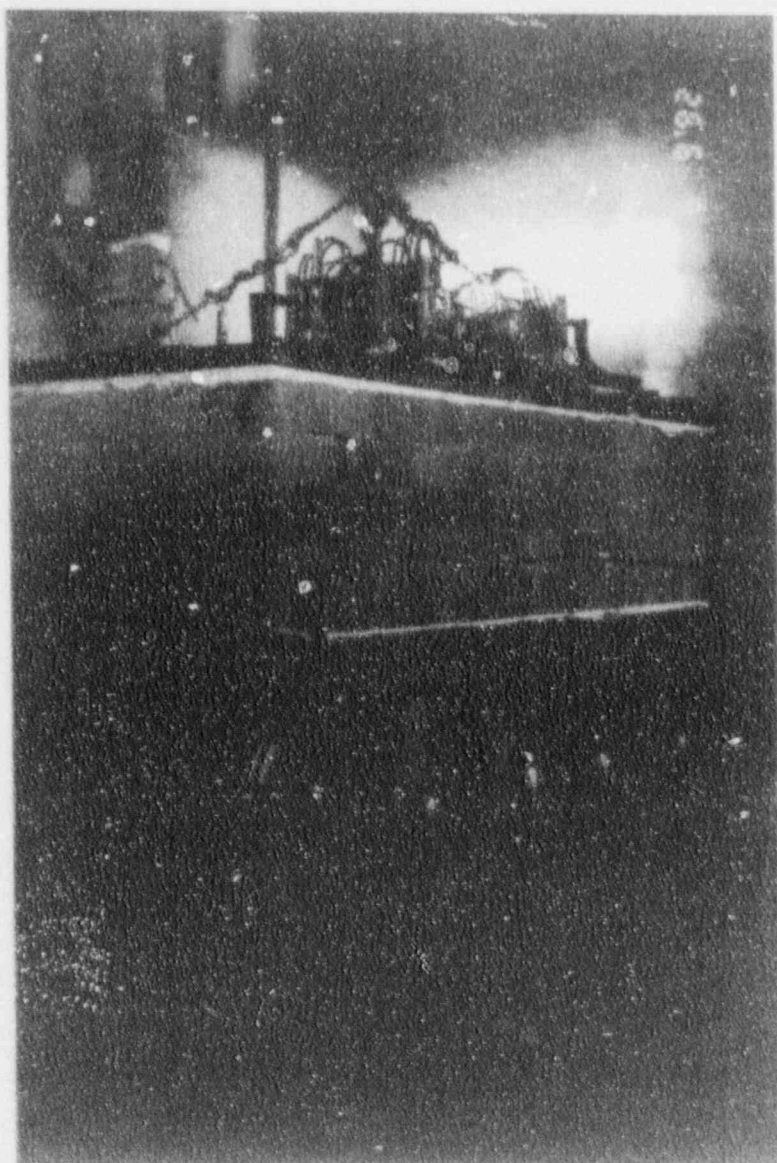
TSI 4





6-9-92

TSE 6



6-9-92

TST 7