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official issue

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TECHNOLOGY
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TEST
REPORT

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TEST REPORT FOR A 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KMI FIRE PROTECTION SYSTEM
FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119
NRC GL 86/10 SUPPLEMENT 1

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REVISION SHEET

PAGES AFFECTED	SECTION	DATE	REVISION SUMMARY	REVISED BY
1		31.8.94	Address	
3	Summary	31.8.94	Inclusion of hose stream test	
6	2.1	31.8.94	Gas flow and pressure control	
8	3	31.8.94	Moisture content statement	
6	Addendum 1	31.8.94	Hose stream test	

SUMMARY

A fire test was performed on a 36" x 6" cable tray, a 12" x 3.5" cable tray and a 3/4" diameter conduit insulated with KM1 Darmatt fire protection system. The test was carried out in accordance with ASTM E119 specification at the Faverdale Technology Centre, Darlington on 29 March 1994 and was witnessed by Mr J Behn (Commonwealth Edison), Mr K Hawks (Transco) and Mr C Philpott (DEI).

The pass/fail criterion applied was a rise of 139°C in the mean temperature or a 181°C rise in an individual temperature reading.

The time to failure of the three samples under test were as follows:-

36" x 6" cable tray - 79 minutes (139°C rise on mean conductor temperature).

12" x 3½" cable tray - 81 minutes (139°C rise on mean conductor temperature).

¾" conduit - 70 minutes (181°C rise on conduit surface).

A separate fire/hose stream test was performed on a short section of 36" x 6" cable tray insulated with KM1 Darmatt fire protection system. The sample complied with the pass criteria as detailed in ASTM E119 NRC GL 86-10 Supplement 1.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur.

For these reasons it is recommended that the relevance of test reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

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1 INTRODUCTION

This document describes the performance of the developed Darmatt electrical circuit protective system when subjected to fire test conditions.

The Darmatt KM1 system was tested in accordance with the UL 1724 (ASTM E119) (Fire Tests for Electrical Circuit Protective Systems) Specification at the Faverdale Technology Centre (FTC) in the United Kingdom.

The testing of the Darmatt KM1 system was monitored by Mr J Behn (Commonwealth Edison), Mr K Hawks (Transco) and Mr C Philpott (DEI).

2 DESCRIPTION OF THE TEST EQUIPMENT

2.1 Furnace

The fire test furnace used was 4 metres long by 3 metres wide and 1.8 metres high (measured internally) and is constructed from a mild steel outer shell and structural steel members.

The furnace was lined with ceramic fibre of 200 mm thickness and fired using 16 natural gas burners providing an approximate heat flux of 200 kW/m².

The burners are controlled individually from a central manifold system using a pump and series of valves to ensure a constant gas flow and pressure to the burners. The pressure within the furnace was monitored by an electronic manometer and adjusted by a system of dampers and forced air injection.

2.2 Floor/Roof Assembly

A roof was constructed from carbon steel sheet which will cover the complete 4 m x 3 m opening in the furnace. Attached to the unexposed surface were steel frameworks from which the raceways were supported externally.

The roof was lined with 200 mm of high grade ceramic fibre. Openings were made in the furnace for the raceways to pass through.

Attachments made for unistrut supports for the raceways descended from the roof of the furnace.

2.3 Raceways

The raceways were constructed from carbon steel and to the sizes shown below.

(a) Cable Trays (Ref Figs 1 and 2, Appendix A)

915 mm wide by 150 mm deep (36" x 6")

305 mm wide by 90 mm deep (12" x 3½")

(b) Conduits

¾" diameter conduit.

The raceways were U-shaped with the vertical drop from the roof being no less than 915 mm as measured from the underside of the roof to the bottom of the tray on the horizontal run.

The horizontal raceways span between the centres of the two vertical drops were 1900 mm in length.

2.4 Cables

All raceways had a 0% solid area cable fill.

3 SAMPLE DETAILS (Ref. Figs 1 and 2, Appendix A)

The insulation itself comprises of an inorganic endothermic material, an organic fibre and an organic polymer binder which are mixed and dried to form a sheet of uniform thickness. From these sheets, fabricated panels were then cut to size and manufactured.

The number of layers and nominal thicknesses used on each raceway are detailed below.

- | | | |
|-------|---------------------|---|
| (i) | 3/4" conduit. | 1 layer of moulded sectional insulation of nominal thickness 39 mm. |
| (ii) | 12" x 6" Cable Tray | 2 layers at nominal 16 mm thick. |
| (iii) | 36" x 6" Cable Tray | 2 layers at nominal 16 mm thick. |

The Darmatt panels require no conditioning or curing time after installation as wet installation methods are not used. Sample checks on moisture content on the Darmatt KM1 boards showed levels were less than 3%.

4 INSTRUMENTATION

4.1 Data Recorder

The two data recorders used were the Solartron Orion Delta model. These are multi-task data processing and recording devices with an accuracy of 0.05°.

4.2 Furnace Thermocouples

The furnace temperature was monitored and controlled with 8 symmetrically positioned thermocouples 1.6 mm diameter, metal sheathed type K, to BS 1041 and BS 4937 Part 4. ASTM thermocouples provided by Underwriter Laboratories (Northbrook) were used for reference and positioned adjacent to the controlling thermocouples.

4.3 Test Sample Thermocouples (Ref Figs 2, 3, 4 and 5, Appendix C)

The test sample thermocouples were calibrated glass covered type K to BS 1041 and BS 4937 Part 4.

The thermocouples are to be positioned as in the above drawings.

- (a) Type C30 with a conductor area of 0.5 mm² on the sides of the raceway. (1) At a point 25 mm from the floor surface, (2) immediately adjacent to the intermediate raceway support and (3) at intermediate pitches of 150 mm.
- (b) Type C40 with a conductor area of 0.22 mm² on 8 AWG bare electrical conductors running the length of the centre line of the raceway on the rungs of the cable tray, below the rungs of the cable tray and where applicable on top of the cable fill at a pitch as defined in section a).

4.4 Differential Pressure Measurement

The differential pressure was measured by an electrical manometer capable of reading pressure within an accuracy of 0.01 inch (2.5 Pa) of water.

The pressure measuring probe tips were manufactured from stainless steel or equivalent material.

5 CONTROL OF FIRE TESTS (Ref figs 7 and 8)

The furnace was controlled to follow the ASTM E119 standard fire curve, the limits imposed were those stated in BS 476 part 20 1987.

A graph showing the ASTM E119 standard fire curve and the actual fire curve achieved during the tests is included in Figure 8a, 8b and 8c of Appendix D.

The percentage deviation (p) of the mean furnace temperature/time curve from the standard temperature/time curve is given by:-

$$p = \frac{A - B}{x} \times 100$$

Where A is the area under the mean furnace temperature/time curve, B is the area under the specified standard temperature/time curve.

A computer programme using Simpsons Rule was used to show the limits on deviation between the measured temperature and the standard temperature/time curve. A typical example of this is shown in Figure 9, Appendix D.

(i) Tolerance

Measured furnace temperature deviations were within the following limits.

- (a) Less than 15% to the end of the first 10 minutes of the heating period or to the end of the test if this is less than 10 minutes.
- (b) Less than 10% from 10 minutes into the test to the end of 30 minutes into the heating period.
- (c) Less than 5% from 30 minutes into the test to the end of the fire test.

(ii) Uniformity of Temperature Distribution

At any time after the first 10 minutes of the heating period, the temperature rise indicated by any of the thermocouples used to determine the mean furnace temperatures did not differ from the corresponding temperature rise given by the standard temperature/time curve by more than 100°C.

6 TEST PROCEDURE

6.1 Installation of the Raceway and Cables

The raceways were supported from the floor/roof at each end from outside of the furnace.

All raceways included a support at the centre of the horizontal run comprising of a P1001 unistrut suspended from the furnace roof. The conduit sample was not supported at its midpoint.

The raceways protected by electrical circuit protective systems were representative of the smallest and largest installed as complete systems and each incorporated at least one intermediate support representative of that for which rating is desired. The raceways terminated a maximum of 915 mm beyond the unexposed surface of the floor or wall assembly.

The electrical conductors within the electrical circuit protective system were simulated by No. 8 AWG (8.38 mm²) stranded medium or hard-drawn temper bar copper conductors weighing 75 g/m. The bare copper conductors had an outside diameter of 3.71 mm and consisted of seven 1.24 mm diameter strands. The bare copper conductors were installed along the entire length of the electrical circuit protective system, and terminated within the floor firestop system.

The firestop system for the floor opening was constructed using materials and techniques that provide an effective heat and smoke seal without influencing the performance of the electrical circuit protective system as a result of degradation or excessive heat transfer to the electrical conductors within the firestop system.

The periphery of the test sample was no closer than 305 mm from the furnace edge.

6.2 Installation of the Test

The test sample was installed in accordance with the assembly steps shown in Figure 1 of Appendix A.

6.3 Furnace Ignition and Temperature (Ref Fig 8, Appendix C)

After all instrumentation had been checked for functionality the burners were ignited and the average furnace temperature was controlled to match as closely as possible the UL 1724 (ASTM E119 standard fire curve). A graph of the time/temperature curve is presented in Figure 8.

6.4 Test Readings

(i) Temperatures

- (a) The average conductor temperature as indicated by the thermocouples on the bare copper conductor for the cable trays and conduits were printed to paper at:

2 minute intervals until 30 minutes into the test,
5 minute intervals from 30 minutes into the test until the end of the test.

- (b) The average furnace temperature was continuously displayed on the data recorder and printed to paper at the frequencies stated above.

- (c) All the individual thermocouple readings were printed to paper at the frequency stated in Clause 6.4 a).

Note an initial print-out was taken before the ignition of the burners to establish ambient conditions.

(ii) Observations

The test samples were continuously monitored and any significant behaviour noted together with the time of the occurrence (refer to Section 8 of this document).

6.5 Duration of the Test

The duration of the test is 60 minutes for both cable trays and the conduit. The duration was extended until the highest mean temperature exceeded 139°C above initial mean temperature.

6.6 Pass/Failure Criteria

(i) Temperature

The pass/failure criteria was that the highest average temperature recorded by any set of thermocouples must not exceed 139°C above the initial starting mean. Also the maximum temperature recorded by any thermocouple must not exceed a 181°C rise above the initial mean.

7 TEST RESULTS

Summarised below are the time to failure results when the results are assessed against the criteria detailed in 6.7.

	Time to Failure (Minutes)	
	139°C rise on mean	181°C rise on individual thermocouple
36" x 6" Cable Tray (A)		
Tray Face X	89	Not achieved
Tray Face Y	88	Not achieved
Inner Conductor	79	84
Outer Conductor	79	84
1/4" Conduit		
Outer surface	74	70
Conductor	83	76
12" x 3 1/2" Cable Tray (B)		
Tray Face X	85	88
Tray Face Y	87	Not achieved
Inner Conductor	81	87
Outer Conductor	82	87

The furnace pressure was found to be 7 Pa throughout the test.

At the time of test the samples obtained for moisture and density determination had the following values:-

	<u>Dry Density (kg/m³)</u>	<u>% Moisture</u>
Slab	668	0.4
Section 1	458	1.3
Section 2	340	0.8

8 OBSERVATIONS

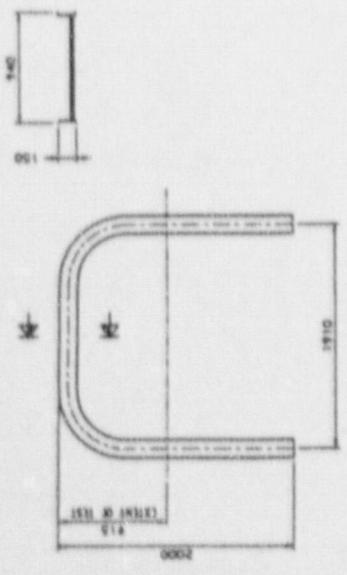
Flaming was observed at intervals throughout the 90 minute test from the Darmatt applied to the 36" x 6" cable tray. No flaming was observed from the Darmatt applied to the 12" x 3½" cable tray or the ¾" conduit.

APPENDIX A

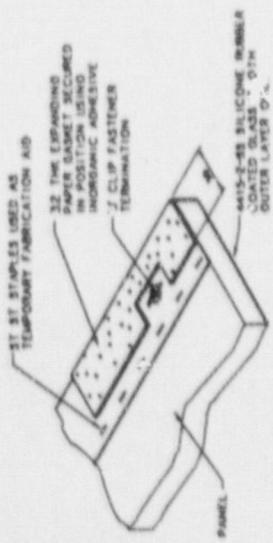
Fig 1a - 36" Cable Tray

Fig 1b - 12" Cable Tray

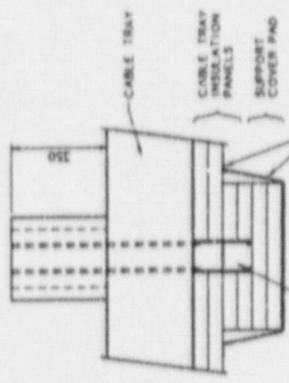
Any errors on this drawing are to be reported to the drawing office immediately by the draughtsman



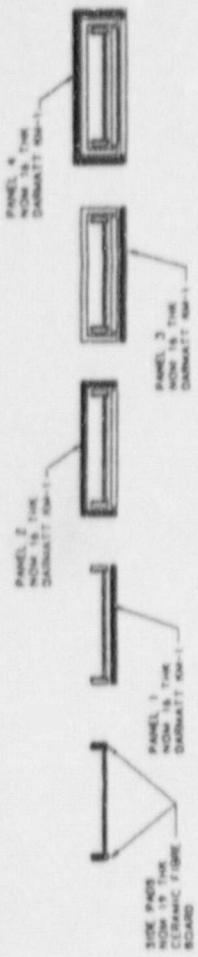
36" CABLE LADDER



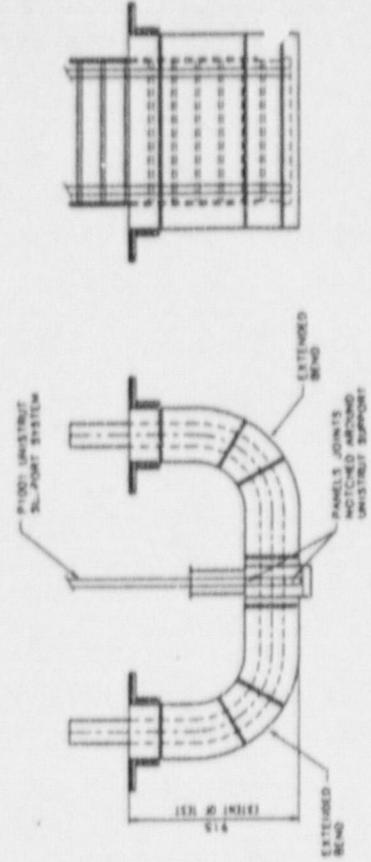
TYPICAL DETAIL OF PANEL GASKET



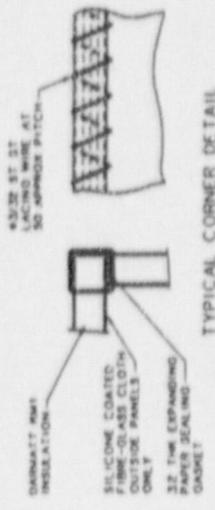
DETAIL OF INSULATION SUPPORT



ASSEMBLY OF INSULATION AROUND 36" CABLE LADDER



TRUE ORIENTATION OF INSULATED TEST SAMPLE IN FURNACE



TYPICAL CORNER DETAIL



TYPICAL PANEL ASSEMBLY

Durham Engineering Ltd
 Suburban
 Preston-Lancs
 England
 EX-10076/05K1

DETAIL OF 36" CABLE LADDER
 FIRE PROTECTION (NM-1) TEST SAMPLE
 1 HOUR TEST

NO	DATE	BY	CHKD	ISSUE	DESCRIPTION
1	24.3.84	KJM	KJM	1	ISSUE
2	24.3.84	KJM	KJM	2	REVISED
3	24.3.84	KJM	KJM	3	REVISED
4	24.3.84	KJM	KJM	4	REVISED
5	24.3.84	KJM	KJM	5	REVISED
6	24.3.84	KJM	KJM	6	REVISED
7	24.3.84	KJM	KJM	7	REVISED
8	24.3.84	KJM	KJM	8	REVISED
9	24.3.84	KJM	KJM	9	REVISED
10	24.3.84	KJM	KJM	10	REVISED
11	24.3.84	KJM	KJM	11	REVISED
12	24.3.84	KJM	KJM	12	REVISED
13	24.3.84	KJM	KJM	13	REVISED
14	24.3.84	KJM	KJM	14	REVISED
15	24.3.84	KJM	KJM	15	REVISED
16	24.3.84	KJM	KJM	16	REVISED
17	24.3.84	KJM	KJM	17	REVISED
18	24.3.84	KJM	KJM	18	REVISED
19	24.3.84	KJM	KJM	19	REVISED
20	24.3.84	KJM	KJM	20	REVISED
21	24.3.84	KJM	KJM	21	REVISED
22	24.3.84	KJM	KJM	22	REVISED
23	24.3.84	KJM	KJM	23	REVISED
24	24.3.84	KJM	KJM	24	REVISED
25	24.3.84	KJM	KJM	25	REVISED
26	24.3.84	KJM	KJM	26	REVISED
27	24.3.84	KJM	KJM	27	REVISED
28	24.3.84	KJM	KJM	28	REVISED
29	24.3.84	KJM	KJM	29	REVISED
30	24.3.84	KJM	KJM	30	REVISED
31	24.3.84	KJM	KJM	31	REVISED
32	24.3.84	KJM	KJM	32	REVISED
33	24.3.84	KJM	KJM	33	REVISED
34	24.3.84	KJM	KJM	34	REVISED
35	24.3.84	KJM	KJM	35	REVISED
36	24.3.84	KJM	KJM	36	REVISED
37	24.3.84	KJM	KJM	37	REVISED
38	24.3.84	KJM	KJM	38	REVISED
39	24.3.84	KJM	KJM	39	REVISED
40	24.3.84	KJM	KJM	40	REVISED
41	24.3.84	KJM	KJM	41	REVISED
42	24.3.84	KJM	KJM	42	REVISED
43	24.3.84	KJM	KJM	43	REVISED
44	24.3.84	KJM	KJM	44	REVISED
45	24.3.84	KJM	KJM	45	REVISED
46	24.3.84	KJM	KJM	46	REVISED
47	24.3.84	KJM	KJM	47	REVISED
48	24.3.84	KJM	KJM	48	REVISED
49	24.3.84	KJM	KJM	49	REVISED
50	24.3.84	KJM	KJM	50	REVISED

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INITIALS

APPENDIX B

Fig 2 - Thermocouple positions on 36" x 6" Cable Tray

Fig 3 - Thermocouple positions on 12" x 3½" Cable Tray

Fig 4 - Thermocouple positions on ¾" Conduit

APPENDIX C

Graphs of the UL 1724 Fire Curve and Achieved Furnace Temperature

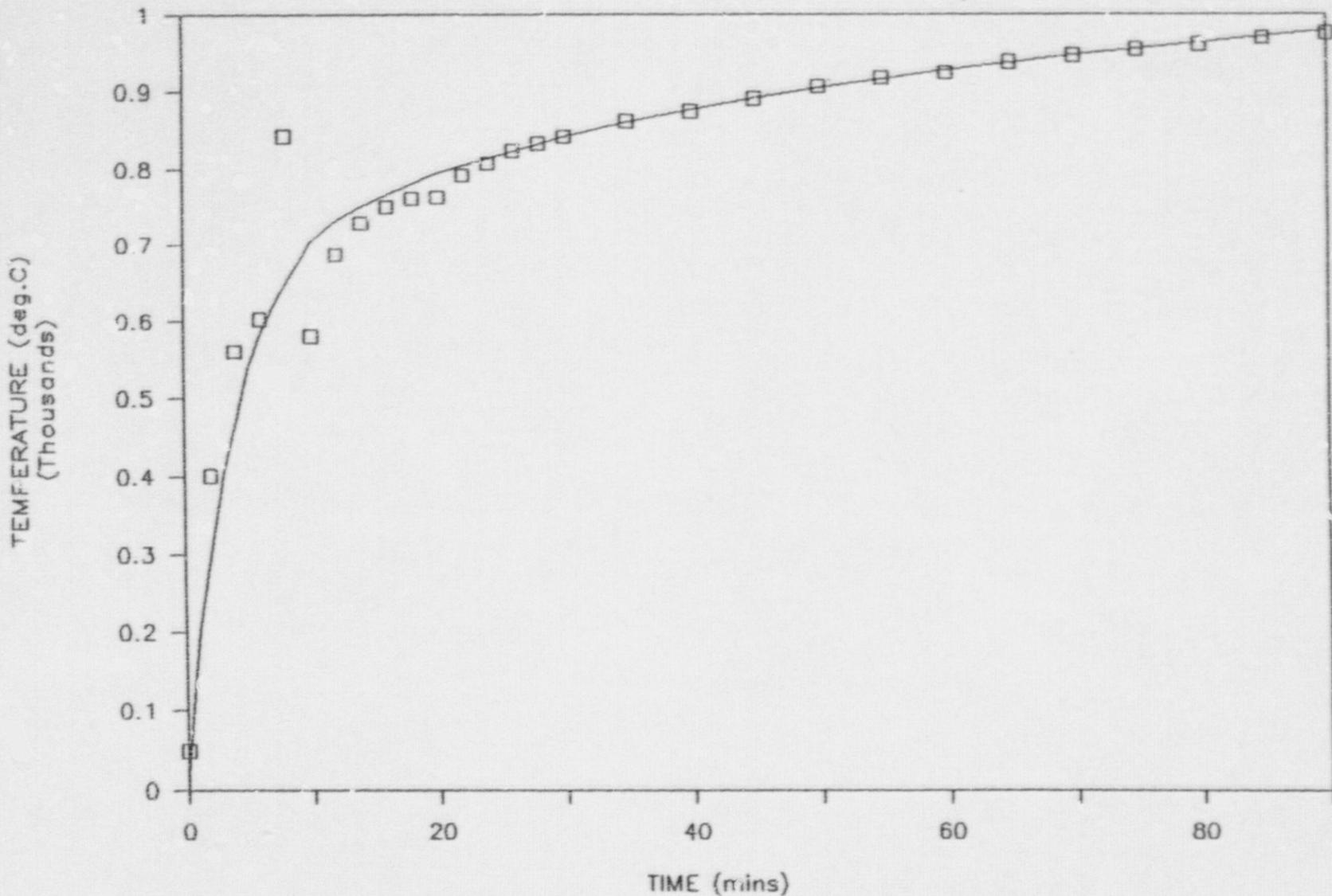
Fire Curve Accuracy Check Data

Summary Tables of Mean Sample Temperatures

Graphs of Mean Unexposed Face Temperatures against Time

ASTM E119 STANDARD FIRECURVE

KM DARMATT CABLE TRAYS AND CONDUIT 29/3



TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KMI FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NKC GL 86/10 SUPPLEMENT 1

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TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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DARMATT CABLE TRAYS PLUS CONDUIT

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Simpson's Rule Numerical Integration

TEST DATA		ASTM E119 Fire curve		
Time, min.	Temp. °C	Cum. °C-min.	Temp. °C	Cum. °C-min.
0	48		20	
1	225		200	
2	401		300	
3	480		400	
4	560		470	
5	581		538	
6	602		582	
7	723		618	
8	844		650	
9	712		675	4095
10	580	5442	704	4817
12	680		732	5540
14	729		750	
16	750		767	
18	762		781	
20	763		795	
22	792		805	
24	808		814	
26	825		824	
28	834		833	18515
30	845	20783	843	20572
33	863		862	22629
40	876		878	
45	892		892	36200
50	907	38319	905	38105
55	918		914	40011
60	924		927	
65	938		937	53802
70	946	56861	946	56634
75	954		955	59465
80	960		963	
85	969		971	72096
90	975	76083	978	75890
95			985	79685

KM1 DARMATT - TEST DATE 29-03-94

36"x6" CABLE TRAY PLUS CONDUIT

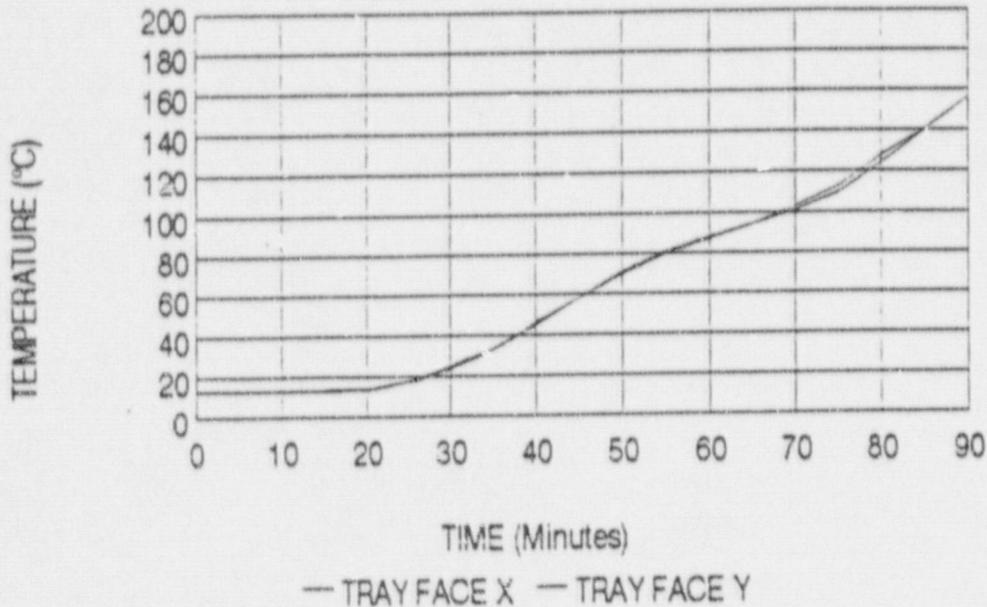
TIME (MINS)	TRAY A SIDE X	TRAY A SIDE Y	INNER CONDUIT	OUTER CONDUIT	CONDUIT OUTER	CONDUIT INNER
0	13	13	14	14	14	15
2	13	13	14	14	14	14
4	13	13	14	14	14	14
6	13	13	14	14	14	14
8	13	13	14	14	15	14
10	13	13	14	14	20	16
12	13	13	14	14	28	19
14	13	13	14	14	46	26
16	14	13	14	14	69	39
18	14	14	15	15	87	58
20	14	14	16	16	98	76
22	16	15	18	18	99	87
24	17	17	20	20	99	93
26	19	18	22	22	99	96
28	22	21	25	25	99	98
30	25	24	28	28	99	99
35	34	33	38	38	99	99
40	46	45	49	49	99	99
45	58	58	60	61	99	100
50	70	71	72	72	100	100
55	80	81	83	82	103	100
60	87	88	93	90	109	101
65	94	94	105	102	123	103
70	101	103	121	119	140	113
75	110	113	138	136	156	128
80	124	128	154	153	173	146
85	140	141	170	169	192	165
90	156	156	186	184	212	186

KM1 DARMATT - TEST DATE 29-03-94

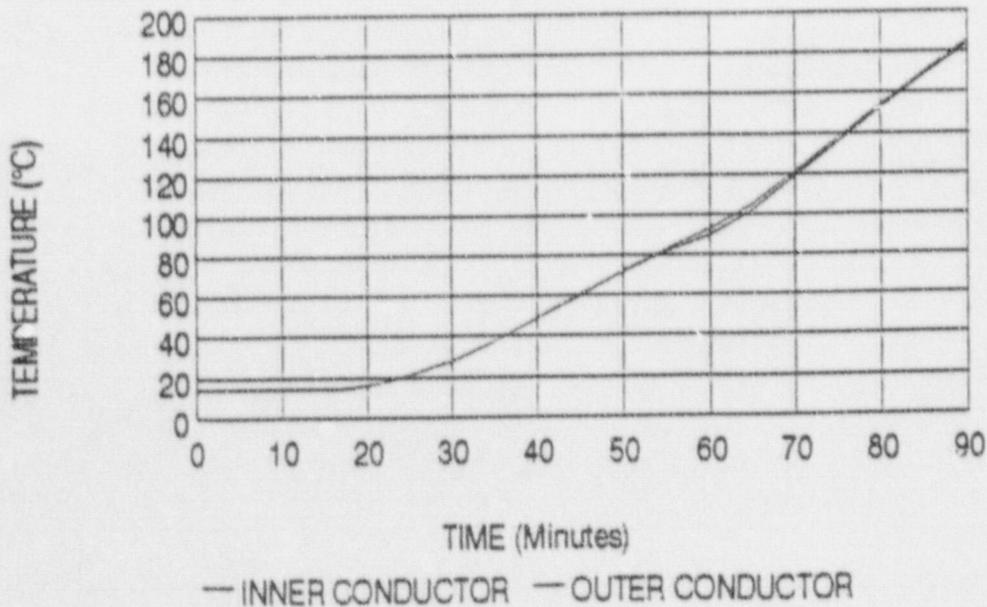
12"x3.5" CABLE TRAY

TIME (MINS)	TRAY B SIDE X	TRAY B SIDE Y	INNER CONDUCT	OUTER CONDUCT
0	14	14	14	15
2	14	13	14	15
4	14	14	14	15
6	14	14	14	15
8	14	14	15	15
10	14	14	14	15
12	14	14	14	15
14	14	14	15	15
16	14	15	15	15
18	15	15	16	16
20	16	16	17	17
22	17	17	18	18
24	19	19	20	20
26	21	21	23	23
28	24	24	26	26
30	27	27	29	29
35	37	37	39	38
40	49	50	51	49
45	61	63	62	61
50	74	77	74	72
55	84	88	84	82
60	91	93	92	89
65	98	96	101	100
70	107	108	115	111
75	120	118	132	128
80	136	132	148	145
85	151	147	165	161
90	168	163	182	178

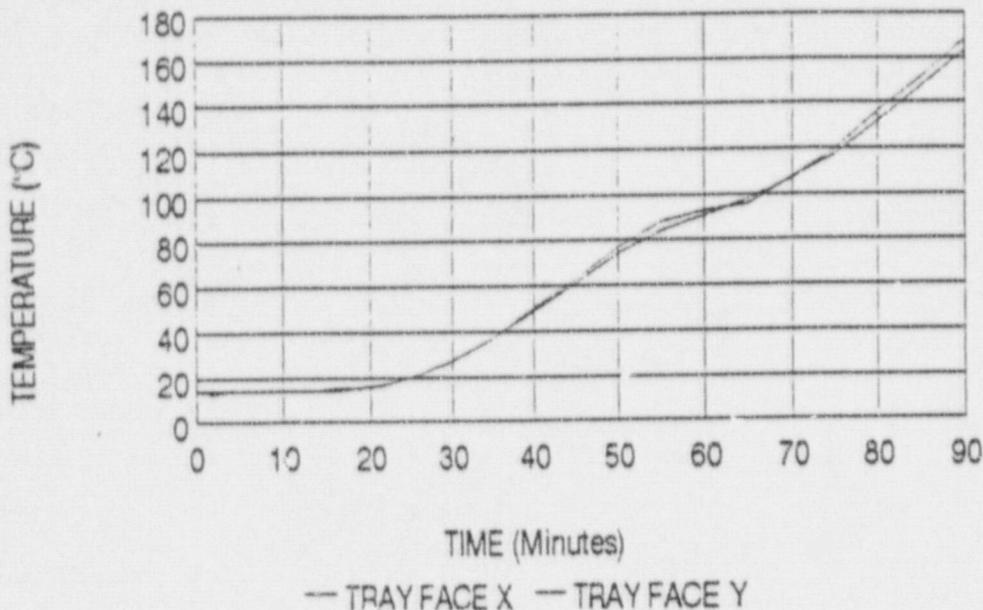
DARMATT KM1 (29/03/94)
36"x6" CABLE TRAY (ZERO FILL)



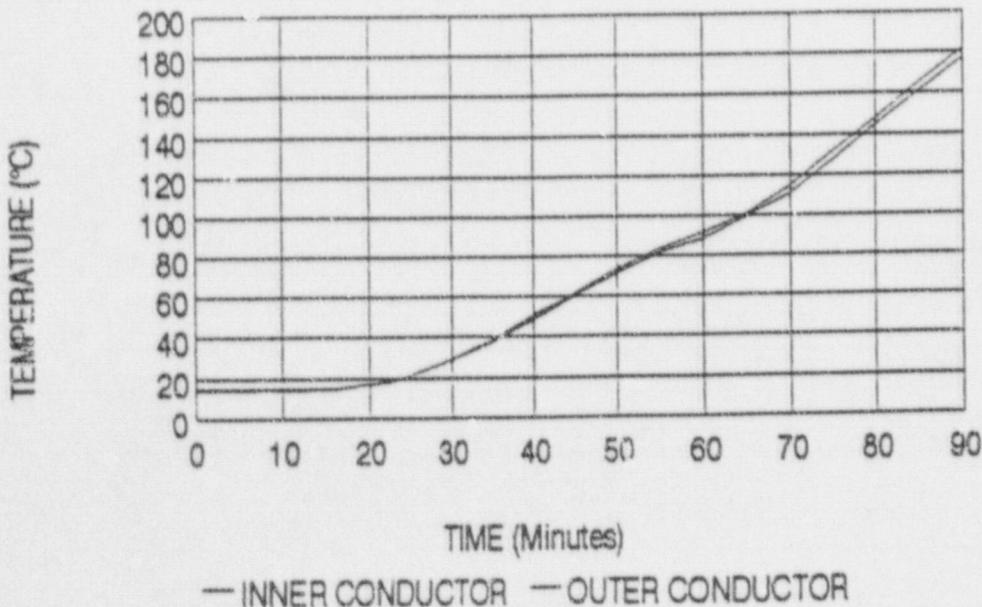
DARMATT KM1 (29/03/94)
36"x6" CABLE TRAY (ZERO FILL)



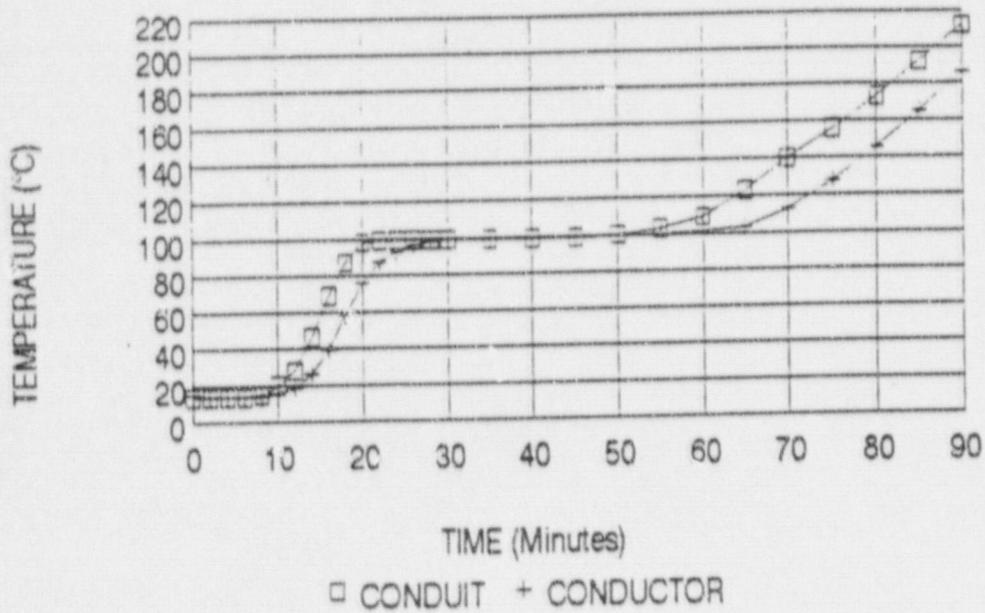
DARMATT KM1 (29/03/94)
12"x3.5" CABLE TRAY (ZERO FILL)



DARMATT KM1 (29/03/94)
12"x3.5" CABLE TRAY (ZERO FILL)



DARMATT KM1 (29/03/94)
0.75" CONDUIT PLUS CONDUCTOR



TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
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APPENDIX D

Complete data printouts of thermocouple readings

36" x 6" Cable Tray plus Conduit

Channel No.	Position
1 - 23	Tray A - Face X
23 - 46	Tray A - Face Y
47 - 69	Inner Conductor
70 - 92	Outer Conductor
93 - 115	Conduit
116, 121 - 142	Inner Conductor
145 - 152	Furnace

Thermocouple 62 removed from mean valve.

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCM (MINS) 0

FURFACE +01190

TRAV FACE 11.404

TRAV FACE 11.771

INLET CNO 11.895

INLET CNO 11.702

INLET CNO 11.471

INLET CNO 11.174

T 1 101-6100.0

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002 0013.18 DAC

003 0013.19 DAC

004 0013.20 DAC

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228 0015.44 DAC

229 0015.45 DAC

230 0015.46 DAC

231 0015.47 DAC

232 0015.4

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KMI FIRE PROTECTION
SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

DOCUMENT NO.
FTCR/94/0060

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STAR - HINS - 4-00000
SURFACE 460-111
TRAJA FACE 11-4019
TRAJA FACE 12-7442
INNER COND 11-6135
OUTER COND 11-6135
CIRCUIT 1-1-140
COND IN 1-1-091

001 0013-11 DAC
002 0013-12 DAC
003 0013-13 DAC
004 0013-14 DAC
005 0013-15 DAC
006 0013-16 DAC
007 0013-17 DAC
008 0013-18 DAC
009 0013-19 DAC
010 0013-20 DAC
011 0013-21 DAC
012 0013-22 DAC
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014 0013-24 DAC
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077 0013-87 DAC
078 0013-88 DAC
079 0013-89 DAC
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082 0013-92 DAC
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147 0550-57 DAC
148 0550-58 DAC
149 0550-59 DAC
150 0570-60 DAC
151 0570-61 DAC
152 0570-62 DAC
D T 1

STAR - HINS - 6-00000
SURFACE 602-330
TRAJA FACE 11-4019
TRAJA FACE 12-7442
INNER COND 11-6279
OUTER COND 11-7153
CIRCUIT 1-1-151
COND IN 1-1-091

T 1 10450100-0
001 0013-81 DAC
002 0013-82 DAC
003 0013-83 DAC
004 0013-84 DAC
005 0013-85 DAC
006 0013-86 DAC
007 0013-87 DAC
008 0013-88 DAC
009 0013-89 DAC
010 0013-90 DAC
011 0013-91 DAC
012 0013-92 DAC
013 0013-93 DAC
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016 0013-96 DAC
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019 0013-99 DAC
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022 0014-02 DAC
023 0014-03 DAC
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026 0014-06 DAC
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047 0014-27 DAC
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067 0014-47 DAC
068 0014-48 DAC
069 0014-49 DAC
070 0014-50 DAC

071 0013-81 DAC
072 0013-82 DAC
073 0013-83 DAC
074 0013-84 DAC
075 0013-85 DAC
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079 0013-89 DAC
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142 0014-52 DAC
143 0014-53 DAC
144 0550-54 DAC
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146 0550-56 DAC
147 0550-57 DAC
148 0550-58 DAC
149 0550-59 DAC
150 0570-60 DAC
151 0570-61 DAC
152 0570-62 DAC
D T 1

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN (MIN) 1.00000

FURNACE 100.000

TRAVA FACE 11.422

TRAVA FACE 12.0810

INNER COND 11.6095

OUTER COND 12.7570

CONDUIT 10.3510

COND IN 10.0039

T 1 10152100.0

- C 001 0013.40 DAC
- C 002 0013.35 DAC
- C 003 0013.30 DAC
- C 004 0013.25 DAC
- C 005 0013.20 DAC
- C 006 0013.15 DAC
- C 007 0013.10 DAC
- C 008 0013.05 DAC
- C 009 0013.00 DAC
- C 010 0012.95 DAC
- C 011 0012.90 DAC
- C 012 0012.85 DAC
- C 013 0012.80 DAC
- C 014 0012.75 DAC
- C 015 0012.70 DAC
- C 016 0012.65 DAC
- C 017 0012.60 DAC
- C 018 0012.55 DAC
- C 019 0012.50 DAC
- C 020 0012.45 DAC
- C 021 0012.40 DAC
- C 022 0012.35 DAC
- C 023 0012.30 DAC
- C 024 0012.25 DAC
- C 025 0012.20 DAC
- C 026 0012.15 DAC
- C 027 0012.10 DAC
- C 028 0012.05 DAC
- C 029 0012.00 DAC
- C 030 0011.95 DAC
- C 031 0011.90 DAC
- C 032 0011.85 DAC
- C 033 0011.80 DAC
- C 034 0011.75 DAC
- C 035 0011.70 DAC
- C 036 0011.65 DAC
- C 037 0011.60 DAC
- C 038 0011.55 DAC
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- C 040 0011.45 DAC
- C 041 0011.40 DAC
- C 042 0011.35 DAC
- C 043 0011.30 DAC
- C 044 0011.25 DAC
- C 045 0011.20 DAC
- C 046 0011.15 DAC
- C 047 0011.10 DAC
- C 048 0011.05 DAC
- C 049 0011.00 DAC
- C 050 0010.95 DAC
- C 051 0010.90 DAC
- C 052 0010.85 DAC
- C 053 0010.80 DAC
- C 054 0010.75 DAC
- C 055 0010.70 DAC
- C 056 0010.65 DAC
- C 057 0010.60 DAC
- C 058 0010.55 DAC
- C 059 0010.50 DAC
- C 060 0010.45 DAC
- C 061 0010.40 DAC
- C 062 0010.35 DAC
- C 063 0010.30 DAC
- C 064 0010.25 DAC
- C 065 0010.20 DAC
- C 066 0010.15 DAC
- C 067 0010.10 DAC
- C 068 0010.05 DAC
- C 069 0010.00 DAC
- C 070 0013.12 DAC

SCAN (MIN) 10.0000

FURNACE 100.000

TRAVA FACE 11.4110

TRAVA FACE 12.0495

INNER COND 11.6091

OUTER COND 12.7549

CONDUIT 20.3510

COND IN 10.0039

T 2 10154100.0

- C 001 0013.25 DAC
- C 002 0013.20 DAC
- C 003 0013.15 DAC
- C 004 0013.10 DAC
- C 005 0013.05 DAC
- C 006 0013.00 DAC
- C 007 0012.95 DAC
- C 008 0012.90 DAC
- C 009 0012.85 DAC
- C 010 0012.80 DAC
- C 011 0012.75 DAC
- C 012 0012.70 DAC
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- C 026 0012.00 DAC
- C 027 0011.95 DAC
- C 028 0011.90 DAC
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- C 065 0010.05 DAC
- C 066 0010.00 DAC
- C 067 0013.14 DAC
- C 068 0013.27 DAC
- C 069 0012.71 DAC
- C 070 0013.01 DAC

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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SCALE (MIN) 12.0000
 FURNACE 935.651
 TRAVER FACE 11.3549
 TRAVER FACE 12.8751
 INNER COND 11.6039
 OUTER COND 11.7019
 CONDUIT 11.1149
 COND IN 1.1759

T 2 10159100.0
 C 001 0013.11 dnc
 C 002 0013.07 dnc
 C 003 0013.21 dnc
 C 004 0013.57 dnc
 C 005 0013.03 dnc
 C 006 0013.43 dnc
 C 007 0013.06 dnc
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 C 012 0012.90 dnc
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 C 113 0029.51 dnc
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 C 115 0018.82 dnc
 C 116 0018.99 dnc
 C 121 0012.27 dnc
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 C 146 00715.8 dnc
 C 149 00695.9 dnc
 C 150 00672.3 dnc
 C 151 00693.2 dnc
 C 152 00680.6 dnc
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SCALE (MIN) 14.0000
 FURNACE 729.123
 TRAVER FACE 11.4459
 TRAVER FACE 12.9364
 INNER COND 11.7901
 OUTER COND 11.9698
 CONDUIT 45.5200
 COND IN 25.3406

T 2 10159100.0
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 C 150 00787.6 dnc
 C 151 00738.7 dnc
 C 152 00741.7 dnc
 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN (MINS) 14.0000

FURNACE 749.779

TRAJA FACE1 13.4522

TRAJA FACE2 13.2209

INNER COND 14.1749

OUTER COND 14.1371

CONDUIT 13.4444

COND IN 13.4124

T 2 11100100.0

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019 0013.36 dsc
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025 0013.63 dsc
026 0014.19 dsc
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028 0013.69 dsc
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031 0011.34 dsc
032 0012.68 dsc
033 0012.62 dsc
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038 0013.89 dsc
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D T 2

SCAN (MINS) 13.0000

FURNACE 762.475

TRAJA FACE1 13.9356

TRAJA FACE2 13.8070

INNER COND 14.4322

OUTER COND 14.3601

CONDUIT 27.2235

COND IN 27.3618

T 2 11102100.0

001 0013.12 dsc
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D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KM1 FIRE PROTECTION
SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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FURNACE 142.550
 TRA/A FACE/ 14.5176
 TRA/A FACE/ 14.2504
 INNER COND 15.3547
 OUTER COND 16.0240
 CONDUIT 17.9319
 COND IN 18.5177
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 147 0016.6.7 d9C
 148 0017.9.7 d9C
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 152 0016.5.8 d9C
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FURNACE 172.238
 TRA/A FACE/ 15.5238
 TRA/A FACE/ 15.2070
 INNER COND 17.5225
 OUTER COND 17.5968
 CONDUIT 19.0074
 COND IN 16.8939
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 002 0015.77 d9C
 003 0016.22 d9C
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 148 0018.2.4 d9C
 149 0017.9.8 d9C
 150 0016.8.1 d9C
 151 0018.9.4 d9C
 152 0017.7.8 d9C
 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
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SCAN (MIN) 24.0000

FURNACE 109.467

TRAY/FACE 17.0613

TRAY/FACE/ 16.5487

INNER COND 19.5487

WATER COND 19.5487

CONDUIT 19.5487

COND IN 19.5487

T 2 11110100.0
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 002 0015.18 DAC
 003 0017.27 DAC
 004 0019.35 DAC
 005 0021.43 DAC
 006 0023.51 DAC
 007 0025.59 DAC
 008 0027.67 DAC
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 032 0077.59 DAC
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 037 0087.99 DAC
 038 0090.07 DAC
 039 0092.15 DAC
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 065 0146.23 DAC
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 068 0152.47 DAC
 069 0154.55 DAC
 070 0156.63 DAC

SCAN (MIN) 26.0000

FURNACE 124.514

TRAY/FACE 19.2249

TRAY/FACE/ 18.4159

INNER COND 22.0159

WATER COND 22.0159

CONDUIT 22.0159

COND IN 22.0159

T 2 11110100.0
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 003 0017.61 DAC
 004 0019.69 DAC
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 006 0023.85 DAC
 007 0025.93 DAC
 008 0028.01 DAC
 009 0030.09 DAC
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 021 0055.05 DAC
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 064 0144.49 DAC
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 066 0148.65 DAC
 067 0150.73 DAC
 068 0152.81 DAC
 069 0154.89 DAC
 070 0156.97 DAC

C 071 0021.97 DAC
 C 072 0023.47 DAC
 C 073 0025.52 DAC
 C 074 0027.71 DAC
 C 075 0029.94 DAC
 C 076 0032.21 DAC
 C 077 0034.52 DAC
 C 078 0036.87 DAC
 C 079 0039.26 DAC
 C 080 0041.69 DAC
 C 081 0044.15 DAC
 C 082 0046.64 DAC
 C 083 0049.16 DAC
 C 084 0051.71 DAC
 C 085 0054.29 DAC
 C 086 0056.90 DAC
 C 087 0059.54 DAC
 C 088 0062.21 DAC
 C 089 0064.91 DAC
 C 090 0067.64 DAC
 C 091 0070.40 DAC
 C 092 0073.19 DAC
 C 093 0076.01 DAC
 C 094 0078.86 DAC
 C 095 0081.73 DAC
 C 096 0084.63 DAC
 C 097 0087.55 DAC
 C 098 0090.49 DAC
 C 099 0093.45 DAC
 C 100 0096.43 DAC
 C 101 0099.43 DAC
 C 102 0102.45 DAC
 C 103 0105.49 DAC
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 C 107 0117.85 DAC
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 C 109 0124.13 DAC
 C 110 0127.29 DAC
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 C 116 0146.61 DAC
 C 117 0149.88 DAC
 C 118 0153.17 DAC
 C 119 0156.47 DAC
 C 120 0159.78 DAC
 C 121 0163.11 DAC
 C 122 0166.45 DAC
 C 123 0169.81 DAC
 C 124 0173.18 DAC
 C 125 0176.56 DAC
 C 126 0179.95 DAC
 C 127 0183.36 DAC
 C 128 0186.78 DAC
 C 129 0190.21 DAC
 C 130 0193.65 DAC
 C 131 0197.10 DAC
 C 132 0200.56 DAC
 C 133 0204.03 DAC
 C 134 0207.51 DAC
 C 135 0210.99 DAC
 C 136 0214.49 DAC
 C 137 0217.99 DAC
 C 138 0221.50 DAC
 C 139 0225.02 DAC
 C 140 0228.55 DAC
 C 141 0232.09 DAC
 C 142 0235.64 DAC
 C 143 0239.20 DAC
 C 144 0242.77 DAC
 C 145 0246.35 DAC
 C 146 0249.94 DAC
 C 147 0253.54 DAC
 C 148 0257.14 DAC
 C 149 0260.75 DAC
 C 150 0264.37 DAC
 C 151 0267.99 DAC
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 C 153 0275.26 DAC
 C 154 0278.91 DAC
 C 155 0282.57 DAC
 C 156 0286.23 DAC
 C 157 0289.90 DAC
 C 158 0293.58 DAC
 C 159 0297.26 DAC
 C 160 0300.95 DAC
 C 161 0304.64 DAC
 C 162 0308.34 DAC
 C 163 0312.04 DAC
 C 164 0315.75 DAC
 C 165 0319.46 DAC
 C 166 0323.18 DAC
 C 167 0326.90 DAC
 C 168 0330.63 DAC
 C 169 0334.36 DAC
 C 170 0338.10 DAC

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KM1 FIRE PROTECTION
SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

DOCUMENT NO.
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ICAN - HINS 11.0000

PURFACE 11.409

TRAVA FACE1 11.7409

TRAVA FACEV 10.8293

INNER COND 11.9883

OUTER COND 11.8330

CONDUIT 11.1460

COND III 11.7104

T 2 11114100.0

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004 0021.48 d3C
005 0022.46 d3C
006 0020.61 d3C
007 0018.77 d3C
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009 0018.75 d3C
010 0019.46 d3C
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013 0021.35 d3C
014 0026.12 d3C
015 0024.40 d3C
016 0033.46 d3C
017 0030.36 d3C
018 0026.77 d3C
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022 0019.42 d3C
023 0013.61 d3C
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029 0021.92 d3C
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068 0014.89 d3C
069 0016.08 d3C

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123 0101.63 d3C
124 0101.83 d3C
125 0100.64 d3C
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127 0101.89 d3C
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131 0027.29 d3C
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133 0029.69 d3C
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136 0029.37 d3C
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141 0029.37 d3C
142 0029.35 d3C
143 0029.28 d3C
144 0029.54 d3C
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146 0029.94 d3C
147 0029.17 d3C
148 0029.99 d3C
149 0029.99 d3C
150 0029.99 d3C
151 0029.99 d3C
152 0029.99 d3C

D T 2

ICAN - HINS 10.0000

PURFACE 042.750

TRAVA FACE1 24.7201

TRAVA FACEV 23.6006

INNER COND 28.2173

OUTER COND 28.0450

CONDUIT 11.3569

COND III 11.6010

T 3 11114100.0

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010 0022.30 d3C
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022 0022.41 d3C
023 0014.02 d3C
024 0017.15 d3C
025 0022.38 d3C
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027 0025.37 d3C
028 0026.58 d3C
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034 0022.41 d3C
035 0019.81 d3C
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055 0027.69 d3C
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057 0027.82 d3C
058 0027.33 d3C
059 0028.19 d3C
060 0029.97 d3C
061 0032.68 d3C
062 0030.81 d3C
063 0032.18 d3C
064 0032.30 d3C
065 0033.48 d3C
066 0031.94 d3C
067 0027.28 d3C
068 0014.78 d3C
069 0017.42 d3C

D T 3

071 0027.32 d3C
072 0031.57 d3C
073 0030.82 d3C
074 0029.59 d3C
075 0027.10 d3C
076 0021.22 d3C
077 0026.36 d3C
078 0026.89 d3C
079 0026.04 d3C
080 0026.42 d3C
081 0024.14 d3C
082 0026.87 d3C
083 0029.02 d3C
084 0030.99 d3C
085 0030.61 d3C
086 0031.16 d3C
087 0031.51 d3C
088 0033.62 d3C
089 0034.19 d3C
090 0033.12 d3C
091 0030.45 d3C
092 0017.42 d3C
093 0027.87 d3C
094 0026.73 d3C
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103 0029.17 d3C
104 0029.93 d3C
105 0100.26 d3C
106 0100.82 d3C
107 0029.47 d3C
108 0029.96 d3C
109 0029.14 d3C
110 0029.21 d3C
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112 0028.83 d3C
113 0029.11 d3C
114 0028.68 d3C
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121 0029.59 d3C
122 0101.12 d3C
123 0101.59 d3C
124 0101.63 d3C
125 0100.66 d3C
126 0100.60 d3C
127 0101.89 d3C
128 0102.76 d3C
129 0102.82 d3C
130 0102.39 d3C
131 0103.44 d3C
132 0029.41 d3C
133 0029.55 d3C
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145 0029.30 d3C
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147 0029.30 d3C
148 0029.30 d3C
149 0029.30 d3C
150 0029.30 d3C
151 0029.30 d3C
152 0029.30 d3C

D T 3

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

DOCUMENT NO.
 FTCR/94/0060

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SCAN (MIN) 15.0000
 FURNACE 161.104
 TRA.A FACE: 14.1139
 TRA.A FACE: 11.1456
 INNER COND 17.6639
 OUTER COND 17.8001
 CONDUIT 19.1491
 COND IN 19.1795

T 1 11124100.0
 001 0018.71 d/c
 002 0019.70 d/c
 003 0020.77 d/c
 004 0021.81 d/c
 005 0022.86 d/c
 006 0023.95 d/c
 007 0025.02 d/c
 008 0026.09 d/c
 009 0027.14 d/c
 010 0028.19 d/c
 011 0029.25 d/c
 012 0030.37 d/c
 013 0031.44 d/c
 014 0032.53 d/c
 015 0033.66 d/c
 016 0034.81 d/c
 017 0035.97 d/c
 018 0037.14 d/c
 019 0038.33 d/c
 020 0039.53 d/c
 021 0040.74 d/c
 022 0041.96 d/c
 023 0043.19 d/c
 024 0044.43 d/c
 025 0045.68 d/c
 026 0046.94 d/c
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 035 0058.73 d/c
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 038 0062.84 d/c
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 040 0065.63 d/c
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 045 0072.78 d/c
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 049 0078.68 d/c
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 055 0087.83 d/c
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 066 0105.54 d/c
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 068 0108.89 d/c
 069 0110.58 d/c
 070 0112.28 d/c

071 0038.39 d/c
 072 0042.62 d/c
 073 0046.87 d/c
 074 0051.14 d/c
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 086 0103.47 d/c
 087 0107.90 d/c
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 089 0116.79 d/c
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 102 0175.55 d/c
 103 0180.14 d/c
 104 0184.74 d/c
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 106 0193.97 d/c
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 120 0259.69 d/c
 121 0264.46 d/c
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 123 0274.03 d/c
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 125 0283.64 d/c
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 127 0293.29 d/c
 128 0298.13 d/c
 129 0302.98 d/c
 130 0307.84 d/c
 131 0312.71 d/c
 132 0317.59 d/c
 133 0322.48 d/c
 134 0327.38 d/c
 135 0332.29 d/c
 136 0337.21 d/c
 137 0342.14 d/c
 138 0347.08 d/c
 139 0352.03 d/c
 140 0356.99 d/c
 141 0361.96 d/c
 142 0366.94 d/c
 143 0371.93 d/c
 144 0376.93 d/c
 145 0381.94 d/c
 146 0386.96 d/c
 147 0391.99 d/c
 148 0397.03 d/c
 149 0402.08 d/c
 150 0407.14 d/c
 151 0412.21 d/c
 152 0417.29 d/c

D T 3

SCAN (MIN) 40.0000
 FURNACE 176.402
 TRA.A FACE: 45.8034
 TRA.A FACE: 44.7878
 INNER COND 46.6591
 OUTER COND 46.5636
 CONDUIT 49.2310
 COND IN 49.1767

T 1 11124100.0
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 003 0020.70 d/c
 004 0021.65 d/c
 005 0022.62 d/c
 006 0023.61 d/c
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 015 0032.97 d/c
 016 0034.06 d/c
 017 0035.16 d/c
 018 0036.27 d/c
 019 0037.39 d/c
 020 0038.52 d/c
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 029 0049.14 d/c
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 032 0052.86 d/c
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 066 0101.31 d/c
 067 0102.91 d/c
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 073 0112.72 d/c
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 150 0270.57 d/c
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 152 0275.46 d/c

D T 3

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 143 0375.22 d/c
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 147 0394.76 d/c
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 149 0404.59 d/c
 150 0409.52 d/c
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 152 0419.41 d/c

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN (MIN) 45.0000

FURNACE 192.174

TRAY A FACE 70.2147

TRAY A FACE 70.1408

INNER COND 60.4485

L. TER COND 60.5097

CONDUIT 88.1251

COND IN 88.7234

T 1 11124100.0

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 010 0090.36 dxc
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 093 0097.06 dxc
 094 0097.76 dxc
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 114 0100.06 dxc
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 139 0102.31 dxc
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 141 0097.59 dxc
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 143 0098.03 dxc
 144 0099.18 dxc
 147 0098.14 dxc
 148 0097.5 dxc
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 150 0097.6 dxc
 151 0098.2 dxc
 152 0097.5 dxc

D T 3

SCAN (MIN) 50.0000

FURNACE 196.100

TRAY A FACE 69.9513

TRAY A FACE 71.4889

INNER COND 71.2744

OUTER COND 71.0121

CONDUIT 100.417

COND IN 88.4596

T 1 11124100.0

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 005 0074.53 dxc
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 008 0071.26 dxc
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 015 0073.36 dxc
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 018 0077.36 dxc
 019 0076.82 dxc
 020 0076.00 dxc
 021 0074.80 dxc
 022 0070.19 dxc
 023 0027.86 dxc
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 030 0072.13 dxc
 031 0072.31 dxc
 032 0069.13 dxc
 033 0075.94 dxc
 034 0077.86 dxc
 035 0098.53 dxc
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 037 0076.58 dxc
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 044 0073.49 dxc
 045 0095.23 dxc
 046 0026.68 dxc
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 049 0079.67 dxc
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 054 0074.84 dxc
 055 0074.56 dxc
 056 0073.55 dxc
 057 0073.17 dxc
 058 0073.52 dxc
 059 0073.06 dxc
 060 0075.21 dxc
 061 0079.61 dxc
 062 0076.37 dxc
 063 0077.78 dxc
 064 0077.04 dxc
 065 0078.54 dxc
 066 0076.60 dxc
 067 0072.73 dxc
 068 0027.79 dxc
 069 0099.61 dxc
 070 0099.61 dxc

D T 3

071 0075.98 dxc
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 073 0076.87 dxc
 074 0075.36 dxc
 075 0073.76 dxc
 076 0090.80 dxc
 077 0073.17 dxc
 078 0073.28 dxc
 079 0072.09 dxc
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 081 0067.65 dxc
 082 0070.36 dxc
 083 0074.82 dxc
 084 0077.15 dxc
 085 0076.75 dxc
 086 0077.01 dxc
 087 0077.21 dxc
 088 0079.79 dxc
 089 0079.97 dxc
 090 0079.34 dxc
 091 0077.68 dxc
 092 0097.17 dxc
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 096 0099.24 dxc
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 098 0099.31 dxc
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 152 0098.28 dxc

D T 3

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN (HITS) 55.0000
 FURNACE 917.510
 TRAY FACE: 79.7031
 TRAY FACE: 81.2413
 DRIP COND 12.5661
 OUTER COND 31.5882
 CONDUIT 103.219
 COND ID 99.717

T 3 11119100.0
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 002 0091.11 d/c
 003 0091.96 d/c
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 005 0092.52 d/c
 006 0092.56 d/c
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 012 0091.14 d/c
 013 0091.07 d/c
 014 0091.72 d/c
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 D T 3

SCAN (HITS) 60.0000
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 TRAY FACE: 87.2067
 TRAY FACE: 87.5827
 DRIP COND 92.7992
 OUTER COND 98.3772
 CONDUIT 99.212
 COND ID 99.759

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 136 0091.54 d/c
 137 0091.7 d/c
 138 0091.3 d/c
 139 0091.8 d/c
 140 0091.3 d/c
 141 0100.81 d/c
 142 0091.69 d/c
 143 0091.77 d/c
 144 0091.2 d/c
 145 0091.54 d/c
 146 0091.7 d/c
 147 0091.3 d/c
 148 0091.8 d/c
 149 0091.3 d/c
 150 0091.8 d/c
 151 0091.3 d/c
 152 0091.3 d/c
 D T 3

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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 (LAW - MIN) 45.0000
 SURFACE 438.845
 TRAIL FACE: 93.8920
 TRAIL FACE: 94.3217
 INNER COND 104.734
 OUTER COND 101.708
 CONDUIT 122.501
 COND IN 103.103

T 3 11154100.0
 001 0074.45 dsc
 002 0076.00 dsc
 003 0076.46 dsc
 004 0075.08 dsc
 005 0074.44 dsc
 006 0074.12 dsc
 007 0074.57 dsc
 008 0072.55 dsc
 009 0071.30 dsc
 010 0100.91 dsc
 011 0075.97 dsc
 012 0077.00 dsc
 013 0106.33 dsc
 014 0105.46 dsc
 015 0079.94 dsc
 016 0104.19 dsc
 017 0101.73 dsc
 018 0100.77 dsc
 019 0076.76 dsc
 020 0075.41 dsc
 021 0074.68 dsc
 022 0072.07 dsc
 023 0052.19 dsc
 024 0069.66 dsc
 025 0072.65 dsc
 026 0077.31 dsc
 027 0074.66 dsc
 028 0102.54 dsc
 029 0076.36 dsc
 030 0090.35 dsc
 031 0091.93 dsc
 032 0072.39 dsc
 033 0079.13 dsc
 034 0072.79 dsc
 035 0079.55 dsc
 036 0077.16 dsc
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 038 0103.35 dsc
 039 0079.25 dsc
 040 0100.29 dsc
 041 6.02.66 dsc
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 047 0076.83 dsc
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 056 0106.82 dsc
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 064 0113.82 dsc
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 068 0093.91 dsc
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 070 0094.55 dsc

071 0101.42 dsc
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 073 0112.15 dsc
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 085 0119.01 dsc
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 087 0109.12 dsc
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 089 0106.23 dsc
 090 0103.23 dsc
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 092 0072.13 dsc
 093 0077.47 dsc
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 095 0142.79 dsc
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 097 0139.91 dsc
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 102 0099.30 dsc
 103 0107.01 dsc
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 105 0.35.45 dsc
 106 1.40.74 dsc
 107 3130.40 dsc
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 109 0113.22 dsc
 110 0103.83 dsc
 111 0132.97 dsc
 112 0170.20 dsc
 113 0172.36 dsc
 114 0124.82 dsc
 115 0097.08 dsc
 116 0098.22 dsc
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 122 0109.34 dsc
 123 0110.75 dsc
 124 0107.67 dsc
 125 0100.44 dsc
 126 0099.31 dsc
 127 0102.28 dsc
 128 0100.41 dsc
 129 0099.16 dsc
 130 0099.13 dsc
 131 0102.04 dsc
 132 0103.78 dsc
 133 0108.98 dsc
 134 0106.58 dsc
 135 0109.14 dsc
 136 0107.26 dsc
 137 0103.99 dsc
 138 0102.99 dsc
 139 0100.25 dsc
 140 0100.38 dsc
 141 0100.34 dsc
 142 0099.78 dsc
 143 0096.46 dsc
 144 0095.7 dsc
 147 00938.1 dsc
 148 0094.9 dsc
 149 00918.4 dsc
 150 00928.3 dsc
 151 00932.1 dsc
 152 00929.2 dsc
 D T 3

 (LAW - MIN) 70.0000
 SURFACE 445.616
 TRAIL FACE: 101.031
 TRAIL FACE: 102.959
 INNER COND 120.575
 OUTER COND 119.535
 CONDUIT 129.504
 COND IN 113.131

T 3 11154100.0
 001 0074.41 dsc
 002 0077.93 dsc
 003 0083.81 dsc
 004 0104.71 dsc
 005 0104.46 dsc
 006 0100.39 dsc
 007 0077.50 dsc
 008 0079.47 dsc
 009 0075.96 dsc
 010 0104.95 dsc
 011 0104.13 dsc
 012 0079.89 dsc
 013 0109.93 dsc
 014 0121.44 dsc
 015 0109.63 dsc
 016 0114.82 dsc
 017 0113.43 dsc
 018 0109.97 dsc
 019 0102.82 dsc
 020 0079.08 dsc
 021 0079.48 dsc
 022 0077.10 dsc
 023 0058.44 dsc
 024 0071.54 dsc
 025 0075.14 dsc
 026 0108.82 dsc
 027 0106.56 dsc
 028 0112.37 dsc
 029 0107.24 dsc
 030 0099.42 dsc
 031 0099.26 dsc
 032 0099.58 dsc
 033 0110.19 dsc
 034 0100.39 dsc
 035 0099.34 dsc
 036 0105.66 dsc
 037 0118.24 dsc
 038 0112.33 dsc
 039 0110.27 dsc
 040 0112.27 dsc
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 042 0114.42 dsc
 043 0102.68 dsc
 044 0098.78 dsc
 045 0095.94 dsc
 046 0071.46 dsc
 047 0079.18 dsc
 048 0113.08 dsc
 049 0135.89 dsc
 050 0132.18 dsc
 051 0138.11 dsc
 052 0127.81 dsc
 053 0122.47 dsc
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 055 0120.83 dsc
 056 0122.13 dsc
 057 0121.95 dsc
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 062 0130.00 dsc
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 064 0136.04 dsc
 065 0132.91 dsc
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 068 0097.04 dsc
 069 0096.78 dsc
 070 0096.78 dsc

C 071 0121.25 dsc
 C 072 0137.35 dsc
 C 073 0123.69 dsc
 C 074 0129.45 dsc
 C 075 0121.24 dsc
 C 076 0059.23 dsc
 C 077 0116.38 dsc
 C 078 0120.16 dsc
 C 079 0119.31 dsc
 C 080 0117.44 dsc
 C 081 0104.42 dsc
 C 082 0115.50 dsc
 C 083 0123.48 dsc
 C 084 0137.30 dsc
 C 085 0133.40 dsc
 C 086 0138.21 dsc
 C 087 0135.26 dsc
 C 088 0135.86 dsc
 C 089 0130.36 dsc
 C 090 0122.15 dsc
 C 091 0102.92 dsc
 C 092 0075.35 dsc
 C 093 0098.99 dsc
 C 094 0107.21 dsc
 C 095 0167.89 dsc
 C 096 0174.44 dsc
 C 097 0166.79 dsc
 C 098 0120.75 dsc
 C 099 0103.89 dsc
 C 100 0099.66 dsc
 C 101 0099.29 dsc
 C 102 0099.79 dsc
 C 103 0115.66 dsc
 C 104 0149.79 dsc
 C 105 0165.89 dsc
 C 106 0179.31 dsc
 C 107 0174.27 dsc
 C 108 0173.80 dsc
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 C 110 0122.97 dsc
 C 111 0138.18 dsc
 C 112 0179.83 dsc
 C 113 0193.63 dsc
 C 114 0140.82 dsc
 C 115 0097.04 dsc
 C 116 0099.31 dsc
 C 121 0101.55 dsc
 C 122 0132.93 dsc
 C 123 0143.57 dsc
 C 124 0135.89 dsc
 C 125 0114.79 dsc
 C 126 0101.81 dsc
 C 127 0099.04 dsc
 C 128 0090.89 dsc
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 C 131 0113.32 dsc
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 C 133 0137.12 dsc
 C 134 0135.91 dsc
 C 135 0137.48 dsc
 C 136 0123.04 dsc
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 C 147 00937.2 dsc
 C 148 0094.9 dsc
 C 149 00924.6 dsc
 C 150 00936.1 dsc
 C 151 00937.7 dsc
 C 152 00936.8 dsc
 D T 3

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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.....
 ICAH (HINS) 75.0000
 SURFACE 45.455
 TRAVA FACE: 110.113
 TRAVA FACE: 113.042
 INNER COND 117.689
 OUTER COND 116.140
 CONDUIT 115.789
 COND IN 113.449

T 3 11179100.0
 001 0079.21 DAC
 002 0099.05 DAC
 003 0108.16 DAC
 004 0119.47 DAC
 005 0128.12 DAC
 006 0110.13 DAC
 007 0105.16 DAC
 009 0107.21 DAC
 009 0103.85 DAC
 010 0113.19 DAC
 011 0109.77 DAC
 012 0106.16 DAC
 013 0111.45 DAC
 014 0134.21 DAC
 015 0123.43 DAC
 016 0130.26 DAC
 017 0129.62 DAC
 018 0122.93 DAC
 019 0112.43 DAC
 020 0108.60 DAC
 021 0106.12 DAC
 022 0099.32 DAC
 023 0064.18 DAC
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 025 0097.46 DAC
 026 0122.22 DAC
 027 0125.70 DAC
 028 0129.65 DAC
 029 0122.72 DAC
 030 0111.60 DAC
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 032 0110.67 DAC
 033 0122.77 DAC
 034 0107.93 DAC
 035 0101.73 DAC
 036 0104.20 DAC
 037 0128.38 DAC
 038 0124.13 DAC
 039 0124.75 DAC
 040 0129.39 DAC
 041 0133.11 DAC
 042 0129.54 DAC
 043 0100.96 DAC
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 053 0143.13 DAC
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 055 0141.43 DAC
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 057 0148.35 DAC
 058 0135.39 DAC
 059 0139.53 DAC
 060 0144.94 DAC
 061 0157.22 DAC
 063 0158.41 DAC
 064 0160.48 DAC
 065 0156.57 DAC
 066 0152.11 DAC
 067 0137.27 DAC
 068 0181.98 DAC
 069 0050.38 DAC
 070 0089.87 DAC

071 0139.94 DAC
 072 0157.75 DAC
 073 0154.72 DAC
 074 0150.10 DAC
 075 0143.18 DAC
 076 0085.02 DAC
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 078 0139.81 DAC
 079 0139.37 DAC
 080 0133.91 DAC
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 082 0110.19 DAC
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 089 0154.25 DAC
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 091 0116.43 DAC
 092 0079.29 DAC
 093 0098.90 DAC
 094 0108.67 DAC
 095 0172.00 DAC
 096 0203.11 DAC
 097 0194.25 DAC
 098 0150.60 DAC
 099 0117.62 DAC
 100 0099.98 DAC
 101 0099.33 DAC
 102 0099.76 DAC
 103 0134.56 DAC
 104 0177.89 DAC
 105 0199.38 DAC
 106 0215.50 DAC
 107 0212.13 DAC
 108 0208.88 DAC
 109 0174.02 DAC
 110 0150.30 DAC
 111 0150.54 DAC
 112 0171.83 DAC
 113 0197.28 DAC
 114 0148.57 DAC
 115 0097.28 DAC
 116 0100.33 DAC
 121 0101.33 DAC
 122 0128.61 DAC
 123 0173.74 DAC
 124 0167.96 DAC
 125 0142.69 DAC
 126 0114.23 DAC
 127 0099.77 DAC
 128 0097.95 DAC
 129 0099.31 DAC
 130 0110.96 DAC
 131 0141.14 DAC
 132 0161.88 DAC
 133 0179.05 DAC
 134 0182.98 DAC
 135 0179.69 DAC
 136 0155.48 DAC
 137 0117.29 DAC
 138 0102.72 DAC
 139 0100.13 DAC
 140 0100.28 DAC
 141 0099.99 DAC
 142 0099.45 DAC
 145 00985.6 DAC
 146 00974.9 DAC
 147 00965.2 DAC
 148 00955.9 DAC
 149 00943.3 DAC
 150 00933.4 DAC
 151 00925.4 DAC
 152 00911.6 DAC

.....
 ICAH (HINS) 80.0000
 SURFACE 46.431
 TRAVA FACE: 123.864
 TRAVA FACE: 127.548
 INNER COND 124.251
 OUTER COND 122.840
 CONDUIT 123.490
 COND IN 145.874

T 3 12104100.0
 001 0084.75 DAC
 002 0099.97 DAC
 003 0125.25 DAC
 004 0137.19 DAC
 005 0147.93 DAC
 006 0129.37 DAC
 007 0117.55 DAC
 008 0120.36 DAC
 009 0120.21 DAC
 010 0130.44 DAC
 011 0115.36 DAC
 012 0115.49 DAC
 013 0125.36 DAC
 014 0152.15 DAC
 015 0142.15 DAC
 016 0150.27 DAC
 017 0148.49 DAC
 018 0142.43 DAC
 019 0129.46 DAC
 020 0125.02 DAC
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 022 0100.97 DAC
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 024 0074.20 DAC
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 027 0143.71 DAC
 028 0148.26 DAC
 029 0141.82 DAC
 030 0130.40 DAC
 031 0126.78 DAC
 032 0127.01 DAC
 033 0142.61 DAC
 034 0124.78 DAC
 035 0115.74 DAC
 036 0119.38 DAC
 037 0146.85 DAC
 038 0142.78 DAC
 039 0142.86 DAC
 040 0148.90 DAC
 041 0152.15 DAC
 042 0146.07 DAC
 043 0121.25 DAC
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 045 0098.03 DAC
 046 0095.98 DAC
 047 0084.60 DAC
 048 0146.52 DAC
 049 0172.46 DAC
 050 0170.15 DAC
 051 0175.31 DAC
 052 0167.26 DAC
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 054 0160.80 DAC
 055 0161.27 DAC
 056 0160.43 DAC
 057 0158.04 DAC
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 059 0156.47 DAC
 060 0166.31 DAC
 061 0174.90 DAC
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 064 0179.67 DAC
 065 0175.85 DAC
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 070 0094.22 DAC

071 0156.11 DAC
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 091 0132.29 DAC
 092 0083.14 DAC
 093 0099.10 DAC
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 097 0219.38 DAC
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 102 0108.01 DAC
 103 0157.19 DAC
 104 0207.35 DAC
 105 0231.67 DAC
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 107 0244.32 DAC
 108 0239.81 DAC
 109 0206.79 DAC
 110 0178.84 DAC
 111 0168.95 DAC
 112 0189.44 DAC
 113 0203.67 DAC
 114 0152.77 DAC
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 124 0196.71 DAC
 125 0172.92 DAC
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 128 0099.07 DAC
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 132 0197.48 DAC
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 135 0217.52 DAC
 136 0191.67 DAC
 137 0153.12 DAC
 138 0183.24 DAC
 139 0180.29 DAC
 140 0100.43 DAC
 141 0100.23 DAC
 142 0099.71 DAC
 145 00996.4 DAC
 146 00981.9 DAC
 147 00952.4 DAC
 148 00978.8 DAC
 149 00938.0 DAC
 150 00947.8 DAC
 151 00945.6 DAC
 152 00951.0 DAC

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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TEMPERATURE 25.0000
 SURFACE 161.725
 TRAIL FACE 179.705
 TRAIL FACE 181.354
 INNER COND 170.322
 OUTER COND 169.570
 CONDUIT 181.068
 COND IN 185.017

T 3 12109100.0
 C 001 0098.03 d9C
 C 002 0104.29 d9C
 C 003 0182.04 d9C
 C 004 0155.74 d9C
 C 005 0157.00 d9C
 C 006 0151.65 d9C
 C 007 0138.82 d9C
 C 008 0139.45 d9C
 C 009 0135.63 d9C
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 C 011 0170.40 d9C
 C 012 0126.99 d9C
 C 013 0190.39 d9C
 C 014 0171.02 d9C
 C 015 0160.51 d9C
 C 016 0169.26 d9C
 C 017 0168.52 d9C
 C 018 0162.25 d9C
 C 019 0150.60 d9C
 C 020 0192.44 d9C
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 C 022 0106.93 d9C
 C 023 0074.25 d9C
 C 024 0074.61 d9C
 C 025 0104.97 d9C
 C 026 0156.40 d9C
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 C 036 0132.75 d9C
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 C 039 0161.28 d9C
 C 040 0167.06 d9C
 C 041 0170.85 d9C
 C 042 0163.32 d9C
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 C 046 0097.24 d9C
 C 047 0087.53 d9C
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 C 049 0189.61 d9C
 C 050 0198.53 d9C
 C 051 0193.05 d9C
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 C 057 0174.33 d9C
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 C 069 0097.47 d9C

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 C 083 0130.31 d9C
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 C 085 0195.25 d9C
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 C 087 0197.92 d9C
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 C 094 0109.69 d9C
 C 095 0196.73 d9C
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 C 097 0242.76 d9C
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 C 101 0183.24 d9C
 C 102 0111.69 d9C
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 C 104 0236.07 d9C
 C 105 0261.15 d9C
 C 106 0274.62 d9C
 C 107 0270.99 d9C
 C 108 0266.45 d9C
 C 109 0235.57 d9C
 C 110 0196.81 d9C
 C 111 0198.93 d9C
 C 112 0209.76 d9C
 C 113 0215.43 d9C
 C 114 0155.77 d9C
 C 115 0096.76 d9C
 C 116 0100.90 d9C
 C 121 0181.37 d9C
 C 122 0153.68 d9C
 C 123 0216.81 d9C
 C 124 0224.13 d9C
 C 125 0201.62 d9C
 C 126 0165.82 d9C
 C 127 0125.89 d9C
 C 128 0186.39 d9C
 C 129 0112.21 d9C
 C 130 0149.89 d9C
 C 131 0198.31 d9C
 C 132 0238.41 d9C
 C 133 0250.89 d9C
 C 134 0255.56 d9C
 C 135 0250.69 d9C
 C 136 0228.06 d9C
 C 137 0199.21 d9C
 C 138 0124.57 d9C
 C 139 0188.24 d9C
 C 140 0188.43 d9C
 C 141 0099.94 d9C
 C 142 0099.58 d9C
 C 145 01000.2 d9C
 C 146 00989.7 d9C
 C 147 00959.6 d9C
 C 148 00973.9 d9C
 C 149 00958.5 d9C
 C 150 00968.4 d9C
 C 151 00961.5 d9C
 C 152 00953.8 d9C
 D T 3

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KMI FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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STAIR WIDTH: 10.0000
 STAIR FACE: 174.975
 STAIR FACE: 155.872
 STAIR FACE: 155.960
 INNER COND: 126.131
 OUTER COND: 102.062
 CONDUIT: 212.052
 COND IN: 125.717

TEST 12114100.0
 001 0099.12 DAC
 002 0105.10 DAC
 003 0160.16 DAC
 004 0174.10 DAC
 005 0188.19 DAC
 006 0179.37 DAC
 007 0161.47 DAC
 008 0160.52 DAC
 009 0159.43 DAC
 010 0168.72 DAC
 011 0148.77 DAC
 012 0140.03 DAC
 013 0156.73 DAC
 014 0189.24 DAC
 015 0179.12 DAC
 016 0193.87 DAC
 017 0199.09 DAC
 018 0132.14 DAC
 019 0171.41 DAC
 020 0160.55 DAC
 021 0149.33 DAC
 022 0113.85 DAC
 023 0078.82 DAC
 024 0075.64 DAC
 025 0119.97 DAC
 026 0172.32 DAC
 027 0178.36 DAC
 028 0184.90 DAC
 029 0190.56 DAC
 030 0170.90 DAC
 031 0169.70 DAC
 032 0167.32 DAC
 033 0181.80 DAC
 034 0159.81 DAC
 035 0140.62 DAC
 036 0147.50 DAC
 037 0181.23 DAC
 038 0179.49 DAC
 039 0180.20 DAC
 040 0185.34 DAC
 041 0189.92 DAC
 042 0181.07 DAC
 043 0144.93 DAC
 044 0103.50 DAC
 045 0099.80 DAC
 046 0098.02 DAC
 047 0098.92 DAC
 048 0173.50 DAC
 049 0206.07 DAC
 050 0206.65 DAC
 051 0210.44 DAC
 052 0205.00 DAC
 053 0201.95 DAC
 054 0199.72 DAC
 055 0199.58 DAC
 056 0197.17 DAC
 057 0191.95 DAC
 058 0183.43 DAC
 059 0198.50 DAC
 060 0199.71 DAC
 061 0209.29 DAC
 063 0212.15 DAC
 064 0214.77 DAC
 065 0211.64 DAC
 066 0205.04 DAC
 067 0186.38 DAC
 068 0138.39 DAC
 069 0062.57 DAC
 070 0101.19 DAC

071 0195.76 DAC
 072 0210.70 DAC
 073 0210.26 DAC
 074 0208.06 DAC
 075 0202.92 DAC
 076 0079.37 DAC
 077 0197.91 DAC
 078 0198.13 DAC
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 080 0185.14 DAC
 081 0159.16 DAC
 082 0176.47 DAC
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 084 0208.24 DAC
 085 0212.14 DAC
 086 0213.88 DAC
 087 0215.18 DAC
 088 0216.76 DAC
 089 0209.96 DAC
 090 0197.19 DAC
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 094 0110.44 DAC
 095 0217.27 DAC
 096 0263.56 DAC
 097 0262.85 DAC
 098 0239.89 DAC
 099 0199.63 DAC
 100 0163.53 DAC
 101 0119.70 DAC
 102 0147.35 DAC
 103 0212.41 DAC
 104 0263.35 DAC
 105 0286.67 DAC
 106 0297.42 DAC
 107 0292.69 DAC
 108 0289.26 DAC
 109 0261.03 DAC
 110 0227.52 DAC
 111 0269.03 DAC
 112 0227.00 DAC
 113 0227.01 DAC
 114 0164.27 DAC
 115 0096.29 DAC
 116 0100.51 DAC
 121 0101.58 DAC
 122 0174.77 DAC
 123 0236.69 DAC
 124 0247.00 DAC
 125 0228.52 DAC
 126 0195.33 DAC
 127 0154.46 DAC
 128 0126.18 DAC
 129 0133.45 DAC
 130 0178.04 DAC
 131 0228.38 DAC
 132 0259.94 DAC
 133 0277.84 DAC
 134 0281.72 DAC
 135 0276.84 DAC
 136 0257.36 DAC
 137 0231.15 DAC
 138 0198.80 DAC
 139 0180.37 DAC
 140 0186.55 DAC
 141 0180.38 DAC
 142 0099.53 DAC
 145 0186.42 DAC
 146 0099.28 DAC
 147 00965.9 DAC
 148 00905.5 DAC
 149 00955.1 DAC
 150 00968.4 DAC
 151 00967.8 DAC
 152 00967.7 DAC
 D T 3
 HRLT 12116101 29-83

TEST RECORD FAVERDALE TECHNOLOGY CENTRE
 ABSTRACT No: 31 - 0076
 RIG NAME: DARMATT KMI - CASEWAY A (1st)
 TEST SPECIFICATION: FROM E119 (R85/31 - 0076/1)
 SIGNATURE: [Signature]
 DATE: 27/3/94

12" x 3½" Cable Tray

Channel No.	Position
1 - 23	Face X
24 - 46	Face Y
47 - 69	Inner conductor
70 - 92	Outer conductor
93 - 100	O/L Furnace T/Cs

Thermocouples 24, 36 and 52 removed from main valves.

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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RUN 10194110 29-03

SCRAPE TIME: 0

UL T.C1: 17.2522

TRAVE FACE: 13.9952

TRAVE FACE: ~~13.9952~~

INNER COND: ~~14.5205~~

OUTER COND: 14.5205

SCRAPE TIME: 2.00000

UL T.C1: 18.5144

TRAVE FACE: 13.9952

TRAVE FACE: ~~13.9952~~

INNER COND: ~~14.5205~~

OUTER COND: 14.5205

I T 1 10194110.2
 C 001 0013.70 dsc
 C 002 0013.74 dsc
 C 003 0013.78 dsc
 C 004 0013.75 dsc
 C 005 0013.71 dsc
 C 006 0013.69 dsc
 C 007 0013.66 dsc
 C 008 0013.51 dsc
 C 009 0013.76 dsc
 C 010 0013.78 dsc
 C 011 0013.47 dsc
 C 012 0013.79 dsc
 C 013 0013.07 dsc
 C 014 0013.84 dsc
 C 015 0013.99 dsc
 C 016 0014.10 dsc
 C 017 0013.31 dsc
 C 018 0014.35 dsc
 C 019 0014.14 dsc
 C 020 0014.44 dsc
 C 021 0014.01 dsc
 C 022 0013.95 dsc
 C 023 0013.55 dsc
 C 024 0013.28 dsc
 C 025 0013.61 dsc
 C 027 0013.14 dsc
 C 028 0012.67 dsc
 C 029 0014.21 dsc
 C 030 0014.73 dsc
 C 031 0013.83 dsc
 C 032 0014.30 dsc
 C 033 0014.41 dsc
 C 034 0012.20 dsc
 C 035 0013.05 dsc
 C 036 0015.26 dsc
 C 037 0014.44 dsc
 C 038 0014.81 dsc
 C 039 0014.15 dsc
 C 040 0014.76 dsc
 C 041 0014.31 dsc
 C 042 0014.54 dsc
 C 043 0014.34 dsc
 C 044 0014.34 dsc
 C 045 0014.01 dsc
 C 046 0013.87 dsc
 C 047 0013.12 dsc
 C 048 0013.39 dsc
 C 049 0014.03 dsc
 C 050 0014.43 dsc
 C 051 0014.34 dsc
 C 052 0014.07 dsc
 C 053 0014.48 dsc
 C 054 0014.80 dsc
 C 055 0014.86 dsc
 C 056 0014.81 dsc
 C 057 0014.56 dsc
 C 058 0014.70 dsc
 C 059 0014.55 dsc
 C 060 0014.99 dsc

061 0014.75 dsc
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 063 0014.40 dsc
 064 0014.53 dsc
 065 0014.32 dsc
 066 0014.53 dsc
 067 0014.26 dsc
 068 0014.23 dsc
 069 0013.87 dsc
 070 0013.21 dsc
 071 0013.83 dsc
 072 0014.44 dsc
 073 0014.53 dsc
 074 0014.86 dsc
 075 0014.77 dsc
 076 0015.14 dsc
 077 0014.99 dsc
 078 0015.23 dsc
 079 0014.98 dsc
 080 0015.17 dsc
 081 0014.62 dsc
 082 0014.73 dsc
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 085 0014.43 dsc
 086 0014.25 dsc
 087 0014.17 dsc
 088 0014.52 dsc
 089 0014.06 dsc
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 092 0014.09 dsc
 093 0014.44 dsc
 094 0017.61 dsc
 095 0017.13 dsc
 096 0017.53 dsc
 097 0017.17 dsc
 098 0017.11 dsc
 099 0017.37 dsc
 100 0017.90 dsc

D T 1

I T 1 10194110.2
 C 001 0013.00 dsc
 C 002 0013.78 dsc
 C 003 0013.80 dsc
 C 004 0014.58 dsc
 C 005 0014.23 dsc
 C 006 0014.47 dsc
 C 007 0014.10 dsc
 C 008 0014.56 dsc
 C 009 0013.82 dsc
 C 010 0014.02 dsc
 C 011 0013.52 dsc
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 C 018 0014.34 dsc
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 C 020 0014.68 dsc
 C 021 0014.04 dsc
 C 022 0013.97 dsc
 C 023 0013.58 dsc
 C 024 0013.37 dsc
 C 025 0013.87 dsc
 C 027 0013.15 dsc
 C 028 0012.66 dsc
 C 029 0014.33 dsc
 C 030 0014.74 dsc
 C 031 0013.83 dsc
 C 032 0014.35 dsc
 C 033 0014.42 dsc
 C 034 0012.23 dsc
 C 035 0013.06 dsc
 C 036 0015.14 dsc
 C 037 0014.48 dsc
 C 038 0014.83 dsc
 C 039 0014.15 dsc
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 C 041 0014.30 dsc
 C 042 0014.58 dsc
 C 043 0014.37 dsc
 C 044 0014.38 dsc
 C 045 0014.01 dsc
 C 046 0013.89 dsc
 C 047 0013.18 dsc
 C 048 0014.06 dsc
 C 049 0014.07 dsc
 C 050 0014.43 dsc
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 C 052 0014.07 dsc
 C 053 0014.50 dsc
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 C 055 0014.85 dsc
 C 056 0014.82 dsc
 C 057 0014.58 dsc
 C 058 0014.71 dsc
 C 059 0014.61 dsc
 C 060 0015.04 dsc

061 0014.60 dsc
 062 0014.82 dsc
 063 0014.47 dsc
 064 0014.57 dsc
 065 0014.33 dsc
 066 0014.56 dsc
 067 0014.30 dsc
 068 0014.25 dsc
 069 0013.73 dsc
 070 0013.24 dsc
 071 0013.82 dsc
 072 0014.50 dsc
 073 0014.56 dsc
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 075 0014.81 dsc
 076 0015.15 dsc
 077 0014.99 dsc
 078 0015.28 dsc
 079 0014.97 dsc
 080 0015.20 dsc
 081 0014.43 dsc
 082 0014.77 dsc
 083 0014.56 dsc
 084 0014.93 dsc
 085 0014.45 dsc
 086 0014.10 dsc
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 088 0014.59 dsc
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 092 0014.11 dsc
 093 0013.76 dsc
 094 0014.62 dsc
 095 0014.15 dsc
 096 0015.31 dsc
 097 0013.46 dsc
 098 0013.20 dsc
 099 0014.16 dsc
 100 0014.82 dsc

O I 1

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DAR/MATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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 SCALP HITS: 4.00000
 UL T.C3 153.743
 TRA/B FACE: 13.9561
 TRA/B FACE: 13.9561
 INNER COND 13.9561
 OUTER COND 14.5134
 SCALP HITS: 4.00000
 UL T.C3 108.660
 TRA/B FACE: 13.9525
 TRA/B FACE: 13.9520
 INNER COND 13.9520
 OUTER COND 14.5135

S T 1 10150110.2
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 C 002 0013.90 d3C
 C 003 0013.73 d3C
 C 004 0014.53 d3C
 C 005 0014.18 d3C
 C 006 0014.81 d3C
 C 007 0014.09 d3C
 C 008 0014.73 d3C
 C 009 0013.77 d3C
 C 010 0013.98 d3C
 C 011 0013.47 d3C
 C 012 0013.80 d3C
 C 013 0013.07 d3C
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 C 015 0013.99 d3C
 C 016 0014.09 d3C
 C 017 0013.88 d3C
 C 018 0014.31 d3C
 C 019 0014.15 d3C
 C 020 0014.69 d3C
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 C 027 0013.11 d3C
 C 028 0012.68 d3C
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 C 030 0014.72 d3C
 C 031 0013.83 d3C
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 C 037 0014.44 d3C
 C 038 0014.83 d3C
 C 039 0014.14 d3C
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 C 072 0014.44 d3C
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 C 085 0014.45 d3C
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 C 091 0014.11 d3C
 C 092 0014.13 d3C
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 C 096 0166.30 d3C
 C 097 0143.68 d3C
 C 098 0119.48 d3C
 C 099 0150.42 d3C
 C 100 0175.41 d3C

D T I

S T 1 10150110.2
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 C 003 0013.77 d3C
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 C 096 0317.32 d3C
 C 097 0300.10 d3C
 C 098 0261.90 d3C
 C 099 0306.12 d3C
 C 100 0318.08 d3C

D T I

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN-RUNS: 0.00000
 UL T.CS: 502.111
 TRAVE FACE: 14.2704
 TRAVE FACE: 13.475
 TRAVE FACE: 13.475
 INNER COND: 14.5181
 OUTER COND: 14.4185

SCAN-RUNS: 10.0000
 UL T.CS: 553.479
 TRAVE FACE: 14.0209
 TRAVE FACE: 13.475
 INNER COND: 13.475
 OUTER COND: 14.5756

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D T 1

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 C 056 0014.87 d3C
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 C 058 0014.76 d3C
 C 059 0014.64 d3C
 C 060 0014.97 d3C

S T 1 10154110.2
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 C 002 0013.96 d3C
 C 003 0013.88 d3C
 C 004 0014.88 d3C
 C 005 0014.38 d3C
 C 006 0014.51 d3C
 C 007 0014.20 d3C
 C 008 0014.62 d3C
 C 009 0013.79 d3C
 C 010 0014.06 d3C
 C 011 0013.48 d3C
 C 012 0013.82 d3C
 C 013 0013.16 d3C
 C 014 0014.01 d3C
 C 015 0014.05 d3C
 C 016 0014.10 d3C
 C 017 0013.95 d3C
 C 018 0014.34 d3C
 C 019 0014.18 d3C
 C 020 0014.73 d3C
 C 021 0014.04 d3C
 C 022 0013.98 d3C
 C 023 0013.56 d3C
 C 024 0013.41 d3C
 C 025 0013.73 d3C
 C 026 0013.24 d3C
 C 027 0012.81 d3C
 C 028 0014.40 d3C
 C 029 0014.60 d3C
 C 030 0014.60 d3C
 C 031 0013.94 d3C
 C 032 0014.42 d3C
 C 033 0014.50 d3C
 C 034 0012.24 d3C
 C 035 0013.06 d3C
 C 036 0015.53 d3C
 C 037 0014.53 d3C
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 C 042 0014.62 d3C
 C 043 0014.45 d3C
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 C 047 0013.22 d3C
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 C 049 0014.12 d3C
 C 050 0014.49 d3C
 C 051 0014.43 d3C
 C 052 0014.72 d3C
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 C 057 0014.60 d3C
 C 058 0014.76 d3C
 C 059 0014.64 d3C
 C 060 0014.97 d3C

C 061 0014.87 d3C
 C 062 0014.87 d3C
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 C 066 0014.62 d3C
 C 067 0014.32 d3C
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 C 072 0014.49 d3C
 C 073 0014.63 d3C
 C 074 0014.93 d3C
 C 075 0014.91 d3C
 C 076 0015.23 d3C
 C 077 0017.03 d3C
 C 078 0015.23 d3C
 C 079 0015.07 d3C
 C 080 0015.23 d3C
 C 081 0014.51 d3C
 C 082 0014.82 d3C
 C 083 0014.58 d3C
 C 084 0014.96 d3C
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 C 086 0014.21 d3C
 C 087 0014.20 d3C
 C 088 0014.60 d3C
 C 089 0014.17 d3C
 C 090 0014.43 d3C
 C 091 0014.09 d3C
 C 092 0014.13 d3C
 C 093 0591.37 d3C
 C 094 0572.32 d3C
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 C 096 0566.80 d3C
 C 097 0559.50 d3C
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 C 099 0551.08 d3C
 C 100 0559.50 d3C

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 C 044 0014.46 d3C
 C 045 0014.03 d3C
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TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GI. 86/10 SUPPLEMENT 1

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ICAM-NIMS 12.7000
 UL T.C1 537.250
 TRAVE FACE: 14.0474
 TRAVE FACE: 14.0475
 INNER COND 14.0476
 OUTER COND 14.0477

ICAM-NIMS 14.0000
 UL T.C1 650.333
 TRAVE FACE: 14.1527
 TRAVE FACE: 14.1528
 INNER COND 14.1529
 OUTER COND 14.1530

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 C 003 0013.25 DAC
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 C 010 0014.09 DAC
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 C 058 0014.88 DAC
 C 059 0014.66 DAC
 C 060 0015.07 DAC

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 093 0014.07 DAC
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 099 0014.89 DAC
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D T 1

T 1 10159110.2
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 C 095 0014.93 DAC
 C 096 0014.73 DAC
 C 097 0015.36 DAC
 C 098 0014.89 DAC
 C 099 0014.34 DAC
 C 100 0014.88 DAC

D T 1

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

DOCUMENT NO.
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SCANNING: 20.0000
 UL T.C. 722.296
 TRAY FACE: 15.0305
 TRAY FACE: 15.4227
 INNER COND 15.4227
 OUTER COND 15.4215

SCANNING: 22.0000
 UL T.C. 740.373
 TRAY FACE: 17.0300
 TRAY FACE: 17.4227
 INNER COND 17.4227
 OUTER COND 18.2000

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 C 009 0015.96 DAC
 C 010 0016.01 DAC
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C 061 0016.82 DAC
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 C 099 00719.2 DAC
 C 100 00729.7 DAC
 D T 1

T 1 11106110.2
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 C 091 0018.82 DAC
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 C 096 00775.2 DAC
 C 097 00720.2 DAC
 C 098 03719.8 DAC
 C 099 00730.3 DAC
 C 100 00736.8 DAC
 D T 1

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN (MINS) : 26.0000

UL T. CS 762.016

TRAV/B FACE: 13.7339

TRAV/B FACE: 14.1076

INNER COND: 20.4411

OUTER COND: 20.1512

SCAN (MINS) : 26.0000

UL T. CS 794.203

TRAV/B FACE: 21.0834

TRAV/B FACE: 21.4127

INNER COND: 22.8240

OUTER COND: 22.7614

S T 1 11110110.2

C 001 0012.41 DAC
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D T 1

S T 1 11110110.2

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 C 095 00799.3 DAC
 C 096 00815.1 DAC
 C 097 00772.4 DAC
 C 098 00768.8 DAC
 C 099 00769.2 DAC
 C 100 00776.4 DAC

D T 1

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS O/N DARMATT KMI FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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SCAN RATE: 20.0000
 UL T.CS 796.220
 TRAV FACE: 20.7669
 TRAV FACE: ~~21.3100~~
~~25.5253~~
 INNER COND ~~25.5253~~
 OUTER COND 25.6194

SCAN RATE: 20.0000
 UL T.CS 806.022
 TRAV FACE: 26.9262
 TRAV FACE: ~~27.3611~~
~~31.2204~~
 INNER COND ~~31.2204~~
 OUTER COND 28.6057

S T 1 11112110.2
 C 001 0013.27 dxc
 C 002 0020.69 dxc
 C 003 0025.27 dxc
 C 004 0025.13 dxc
 C 005 0026.16 dxc
 C 006 0025.71 dxc
 C 007 0026.26 dxc
 C 008 0023.26 dxc
 C 009 0023.78 dxc
 C 010 0025.09 dxc
 C 011 0023.34 dxc
 C 012 0020.82 dxc
 C 013 0026.20 dxc
 C 014 0025.75 dxc
 C 015 0025.13 dxc
 C 016 0023.11 dxc
 C 017 0026.19 dxc
 C 018 0026.07 dxc
 C 019 0026.35 dxc
 C 020 0028.17 dxc
 C 021 0028.45 dxc
 C 022 0023.37 dxc
 C 023 0014.70 dxc
 C 025 0021.73 dxc
 C 026 0026.03 dxc
 C 027 0025.39 dxc
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 C 029 0027.45 dxc
 C 030 0027.24 dxc
 C 031 0023.77 dxc
 C 032 0025.07 dxc
 C 033 0024.66 dxc
 C 034 0020.90 dxc
 C 035 0019.29 dxc
 C 036 0000.12 dxc
 C 037 0024.57 dxc
 C 038 0023.79 dxc
 C 039 0021.13 dxc
 C 040 0024.56 dxc
 C 041 0028.24 dxc
 C 042 0026.73 dxc
 C 043 0026.85 dxc
 C 044 0026.70 dxc
 C 045 0023.29 dxc
 C 046 0014.90 dxc
 C 047 0016.15 dxc
 C 048 0024.59 dxc
 C 049 0020.54 dxc
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 C 051 0020.16 dxc
 C 052 0016.89 dxc
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 C 054 0026.49 dxc
 C 055 0025.44 dxc
 C 056 0026.43 dxc
 C 057 0024.79 dxc
 C 058 0024.45 dxc
 C 059 0024.93 dxc
 C 060 0026.78 dxc

C 061 0026.47 dxc
 C 062 0027.29 dxc
 C 063 0026.59 dxc
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 C 065 0028.34 dxc
 C 066 0029.59 dxc
 C 067 0027.66 dxc
 C 068 0026.56 dxc
 C 069 0018.78 dxc
 C 070 0015.70 dxc
 C 071 0024.92 dxc
 C 072 0027.92 dxc
 C 073 0029.13 dxc
 C 074 0029.02 dxc
 C 075 0027.91 dxc
 C 076 0026.77 dxc
 C 077 0026.39 dxc
 C 078 0025.74 dxc
 C 079 0025.92 dxc
 C 080 0024.14 dxc
 C 081 0023.18 dxc
 C 082 0023.27 dxc
 C 083 0026.36 dxc
 C 084 0026.56 dxc
 C 085 0026.53 dxc
 C 086 0017.92 dxc
 C 087 0026.96 dxc
 C 088 0020.21 dxc
 C 089 0029.96 dxc
 C 090 0020.88 dxc
 C 091 0027.04 dxc
 C 092 0021.82 dxc
 C 093 00793.5 dxc
 C 094 00010.5 dxc
 C 095 00002.2 dxc
 C 096 00020.4 dxc
 C 097 00796.9 dxc
 C 098 00775.7 dxc
 C 099 00783.5 dxc
 C 100 00786.9 dxc
 D T 1

S T 2 11114110.2
 C 001 0013.61 dxc
 C 002 0023.24 dxc
 C 003 0028.74 dxc
 C 004 0028.48 dxc
 C 005 0029.56 dxc
 C 006 0029.30 dxc
 C 007 0027.61 dxc
 C 008 0026.25 dxc
 C 009 0027.29 dxc
 C 010 0028.62 dxc
 C 011 0026.56 dxc
 C 012 0023.54 dxc
 C 013 0027.90 dxc
 C 014 0029.56 dxc
 C 015 0020.66 dxc
 C 016 0026.26 dxc
 C 017 0027.61 dxc
 C 018 0029.86 dxc
 C 019 0030.11 dxc
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 C 021 0032.49 dxc
 C 022 0026.47 dxc
 C 023 0015.25 dxc
 C 025 0024.71 dxc
 C 026 0029.40 dxc
 C 027 0020.84 dxc
 C 028 0025.09 dxc
 C 029 0031.26 dxc
 C 030 0030.91 dxc
 C 031 0026.83 dxc
 C 032 0028.42 dxc
 C 033 0028.08 dxc
 C 034 0023.80 dxc
 C 035 0022.05 dxc
 C 036 0005.04 dxc
 C 037 0027.56 dxc
 C 038 0026.97 dxc
 C 039 0023.85 dxc
 C 040 0027.87 dxc
 C 041 0031.94 dxc
 C 042 0030.12 dxc
 C 043 0030.31 dxc
 C 044 0032.51 dxc
 C 045 0026.23 dxc
 C 046 0015.34 dxc
 C 047 0017.22 dxc
 C 048 0028.18 dxc
 C 049 0030.88 dxc
 C 050 0032.13 dxc
 C 051 0032.88 dxc
 C 052 0016.70 dxc
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 C 055 0028.92 dxc
 C 056 0029.96 dxc
 C 057 0028.14 dxc
 C 058 0027.39 dxc
 C 059 0027.95 dxc
 C 060 0030.24 dxc

C 061 0029.94 dxc
 C 062 0030.84 dxc
 C 063 0030.46 dxc
 C 064 0031.27 dxc
 C 065 0032.23 dxc
 C 066 0033.57 dxc
 C 067 0031.50 dxc
 C 068 0030.14 dxc
 C 069 0020.58 dxc
 C 070 0016.69 dxc
 C 071 0026.56 dxc
 C 072 0032.89 dxc
 C 073 0033.40 dxc
 C 074 0033.04 dxc
 C 075 0031.63 dxc
 C 076 0030.24 dxc
 C 077 0029.77 dxc
 C 078 0029.83 dxc
 C 079 0029.26 dxc
 C 080 0027.81 dxc
 C 081 0025.81 dxc
 C 082 0025.97 dxc
 C 083 0029.64 dxc
 C 084 0029.87 dxc
 C 085 0030.81 dxc
 C 086 0018.07 dxc
 C 087 0030.61 dxc
 C 088 0032.12 dxc
 C 089 0024.81 dxc
 C 090 0032.85 dxc
 C 091 0030.74 dxc
 C 092 0023.27 dxc
 C 093 00001.1 dxc
 C 094 00021.8 dxc
 C 095 00009.7 dxc
 C 096 00020.5 dxc
 C 097 00009.8 dxc
 C 098 00787.8 dxc
 C 099 00792.8 dxc
 C 100 00796.1 dxc
 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
 TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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 FTCTR/94/0060

ISSUE B

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 SCALING: 15.0000
 UL T.C1 110.634
 TRA.B FACE: 16.0607
 TRA.B FACE: 17.1309
 TRA.B FACE: 15.0972
 TRA.B FACE: 15.1414
 INNER COND 15.1389
 OUTER COND 15.4805

 SCALING: 40.0000
 UL T.C1 144.544
 TRA.B FACE: 40.7515
 TRA.B FACE: 40.5322
 TRA.B FACE: 40.7857
 TRA.B FACE: 40.5102
 INNER COND 40.4877
 OUTER COND 40.8467

S T 2 11119110.2
 C 001 0015.02 dsc
 C 002 0022.67 dsc
 C 003 0039.93 dsc
 C 004 0039.21 dsc
 C 005 0040.25 dsc
 C 006 0040.11 dsc
 C 007 0039.51 dsc
 C 008 0036.27 dsc
 C 009 0039.03 dsc
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 C 016 0036.19 dsc
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 C 020 0044.04 dsc
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 C 022 0036.55 dsc
 C 023 0017.74 dsc
 C 025 0034.69 dsc
 C 026 0040.00 dsc
 C 027 0039.71 dsc
 C 028 0033.06 dsc
 C 029 0041.05 dsc
 C 030 0042.27 dsc
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 C 036 0006.23 dsc
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 C 038 0037.70 dsc
 C 039 0032.80 dsc
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 C 041 0042.67 dsc
 C 042 0040.91 dsc
 C 043 0041.27 dsc
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 C 047 0021.06 dsc
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 C 049 0042.73 dsc
 C 050 0043.74 dsc
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 C 055 0038.78 dsc
 C 056 0046.24 dsc
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 C 059 0037.21 dsc
 C 060 0040.06 dsc

C 061 0040.08 dsc
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 C 075 0042.70 dsc
 C 076 0040.69 dsc
 C 077 0039.25 dsc
 C 078 0038.82 dsc
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 C 080 0036.11 dsc
 C 081 0034.26 dsc
 C 082 0034.49 dsc
 C 083 0039.27 dsc
 C 084 0039.70 dsc
 C 085 0039.94 dsc
 C 086 0028.14 dsc
 C 087 0041.06 dsc
 C 088 0042.93 dsc
 C 089 0045.25 dsc
 C 090 0044.10 dsc
 C 091 0041.70 dsc
 C 092 0038.89 dsc
 C 093 0042.18 dsc
 C 094 0045.7 dsc
 C 095 0043.1 dsc
 C 096 0045.5 dsc
 C 097 0043.8 dsc
 C 098 0041.5 dsc
 C 099 0041.7 dsc
 C 100 0042.6 dsc
 D T 2

S T 2 11124110.2
 C 001 0017.40 dsc
 C 002 0045.10 dsc
 C 003 0052.60 dsc
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 C 005 0052.95 dsc
 C 006 0053.06 dsc
 C 007 0051.69 dsc
 C 008 0046.76 dsc
 C 009 0050.51 dsc
 C 010 0051.92 dsc
 C 011 0046.49 dsc
 C 012 0044.67 dsc
 C 013 0052.24 dsc
 C 014 0052.39 dsc
 C 015 0052.99 dsc
 C 016 0049.32 dsc
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 C 018 0054.26 dsc
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 C 021 0057.49 dsc
 C 022 0049.06 dsc
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 C 026 0051.85 dsc
 C 027 0052.61 dsc
 C 028 0042.78 dsc
 C 029 0056.48 dsc
 C 030 0055.19 dsc
 C 031 0049.89 dsc
 C 032 0051.90 dsc
 C 033 0052.54 dsc
 C 034 0049.77 dsc
 C 035 0045.65 dsc
 C 036 0018.40 dsc
 C 037 0052.63 dsc
 C 038 0058.22 dsc
 C 039 0044.53 dsc
 C 040 0051.19 dsc
 C 041 0054.55 dsc
 C 042 0053.62 dsc
 C 043 0053.96 dsc
 C 044 0056.74 dsc
 C 045 0049.15 dsc
 C 046 0028.76 dsc
 C 047 0026.66 dsc
 C 048 0051.83 dsc
 C 049 0055.41 dsc
 C 050 0055.89 dsc
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 C 052 0018.82 dsc
 C 053 0052.08 dsc
 C 054 0051.72 dsc
 C 055 0058.21 dsc
 C 056 0051.87 dsc
 C 057 0048.96 dsc
 C 058 0047.22 dsc
 C 059 0048.27 dsc
 C 060 0051.52 dsc

C 061 0051.56 dsc
 C 062 0052.19 dsc
 C 063 0052.01 dsc
 C 064 0053.56 dsc
 C 065 0054.76 dsc
 C 066 0056.19 dsc
 C 067 0054.77 dsc
 C 068 0053.59 dsc
 C 069 0035.58 dsc
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 C 072 0057.22 dsc
 C 073 0057.67 dsc
 C 074 0056.63 dsc
 C 075 0054.92 dsc
 C 076 0052.62 dsc
 C 077 0051.40 dsc
 C 078 0050.08 dsc
 C 079 0058.47 dsc
 C 080 0046.97 dsc
 C 081 0044.65 dsc
 C 082 0044.93 dsc
 C 083 0058.15 dsc
 C 084 0051.03 dsc
 C 085 0051.05 dsc
 C 086 0022.87 dsc
 C 087 0052.77 dsc
 C 088 0054.91 dsc
 C 089 0057.85 dsc
 C 090 0056.28 dsc
 C 091 0054.13 dsc
 C 092 0041.46 dsc
 C 093 0052.2 dsc
 C 094 0058.2 dsc
 C 095 0045.9 dsc
 C 096 0048.4 dsc
 C 097 0042.9 dsc
 C 098 0026.1 dsc
 C 099 0042.6 dsc
 C 100 0042.8 dsc
 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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ISSUE B

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SCREENS: 45.0000

UL T.CS 073.507

TRAY FACE: 61.3675

TRAY FACE: ~~61.3675~~ 61.3675

TRAY FACE: ~~61.3675~~ 61.3675

TRAY FACE: ~~61.3675~~ 61.3675

OUTER COND 40.8068

S T 2 11124110.2
 C 001 0021.71 DAC
 C 002 0057.22 DAC
 C 003 0065.75 DAC
 C 004 0066.09 DAC
 C 005 0066.29 DAC
 C 006 0066.29 DAC
 C 007 0066.29 DAC
 C 008 0066.00 DAC
 C 009 0063.77 DAC
 C 010 0065.27 DAC
 C 011 0061.52 DAC
 C 012 0058.54 DAC
 C 013 0065.82 DAC
 C 014 0065.07 DAC
 C 015 0065.79 DAC
 C 016 0061.29 DAC
 C 017 0064.54 DAC
 C 018 0067.19 DAC
 C 019 0067.78 DAC
 C 020 0069.75 DAC
 C 021 0069.85 DAC
 C 022 0062.07 DAC
 C 023 0027.34 DAC
 C 025 0060.01 DAC
 C 026 0064.82 DAC
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 C 030 0068.46 DAC
 C 031 0063.95 DAC
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 C 035 0067.00 DAC
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 C 037 0066.06 DAC
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 C 043 0047.05 DAC
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 C 054 0067.58 DAC
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 C 057 0061.30 DAC
 C 058 0059.35 DAC
 C 059 0060.27 DAC
 C 060 0063.41 DAC

061 0063.40 DAC
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 063 0063.91 DAC
 064 0065.54 DAC
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 067 0066.74 DAC
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 069 0046.51 DAC
 070 0032.94 DAC
 071 0065.52 DAC
 072 0069.14 DAC
 073 0068.80 DAC
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 075 0067.12 DAC
 076 0065.05 DAC
 077 0063.40 DAC
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 081 0056.62 DAC
 082 0056.90 DAC
 083 0061.60 DAC
 084 0062.58 DAC
 085 0062.61 DAC
 086 0025.99 DAC
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 088 0066.91 DAC
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 090 0068.09 DAC
 091 0066.34 DAC
 092 0054.01 DAC
 093 0068.73 DAC
 094 0068.93 DAC
 095 0069.57 DAC
 096 0069.10 DAC
 097 0065.79 DAC
 098 0065.40 DAC
 099 0062.5 DAC
 100 0068.01 DAC

D T 2
 C 001 0025.72 DAC
 C 002 0072.27 DAC
 C 003 0077.07 DAC
 C 004 0079.73 DAC
 C 005 0078.84 DAC
 C 006 0079.30 DAC
 C 007 0080.61 DAC
 C 008 0077.06 DAC
 C 009 0077.03 DAC
 C 010 0090.63 DAC
 C 011 0075.42 DAC
 C 012 0073.82 DAC
 C 013 0093.34 DAC
 C 014 0079.31 DAC
 C 015 0077.41 DAC
 C 016 0075.60 DAC
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 C 060 0075.47 DAC

C 061 0075.19 DAC
 C 062 0075.72 DAC
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 C 073 0078.92 DAC
 C 074 0079.08 DAC
 C 075 0078.21 DAC
 C 076 0077.27 DAC
 C 077 0075.31 DAC
 C 078 0074.09 DAC
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 C 083 0073.74 DAC
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 C 085 0074.12 DAC
 C 086 0028.55 DAC
 C 087 0076.70 DAC
 C 088 0078.37 DAC
 C 089 0079.47 DAC
 C 090 0078.94 DAC
 C 091 0077.57 DAC
 C 092 0067.54 DAC
 C 093 0090.70 DAC
 C 094 0089.90 DAC
 C 095 00918.0 DAC
 C 096 0089.77 DAC
 C 097 0080.4 DAC
 C 098 0085.1 DAC
 C 099 0066.9 DAC
 C 100 00875.3 DAC

D T 2
 C 001 0025.72 DAC
 C 002 0072.27 DAC
 C 003 0077.07 DAC
 C 004 0079.73 DAC
 C 005 0078.84 DAC
 C 006 0079.30 DAC
 C 007 0080.61 DAC
 C 008 0077.06 DAC
 C 009 0077.03 DAC
 C 010 0090.63 DAC
 C 011 0075.42 DAC
 C 012 0073.82 DAC
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 C 014 0079.31 DAC
 C 015 0077.41 DAC
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 C 017 0076.47 DAC
 C 018 0078.75 DAC
 C 019 0079.57 DAC
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 C 022 0074.29 DAC
 C 023 0034.89 DAC
 C 025 0072.91 DAC
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 C 027 0063.12 DAC
 C 028 0062.83 DAC
 C 029 0081.66 DAC
 C 030 0080.27 DAC
 C 031 0079.36 DAC
 C 032 0088.44 DAC
 C 033 0077.34 DAC
 C 034 0101.00 DAC
 C 035 0091.82 DAC
 C 036 0067.60 DAC
 C 037 0079.36 DAC
 C 038 0076.44 DAC
 C 039 0072.71 DAC
 C 040 0076.75 DAC
 C 041 0079.27 DAC
 C 042 0081.44 DAC
 C 043 0078.98 DAC
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 C 045 0073.83 DAC
 C 046 0031.76 DAC
 C 047 0042.54 DAC
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 C 049 0077.90 DAC
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 C 052 0018.68 DAC
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 C 055 0074.65 DAC
 C 056 0075.62 DAC
 C 057 0073.77 DAC
 C 058 0072.89 DAC
 C 059 0072.85 DAC
 C 060 0075.47 DAC

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

DOCUMENT NO. FTCR/94/0060

ISSUE B

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SCANS: 55.0000

UL T.C1 197.757

TRAVEL FACE: 34.426

TRAVEL FACE: 57.7626

INNER COND 53.4997

OUTER COND 51.6209

S T 2 11199110.2
 C 001 0031.66 DAC
 C 002 0032.40 DAC
 C 003 0037.41 DAC
 C 004 0037.93 DAC
 C 005 0037.41 DAC
 C 006 0039.95 DAC
 C 007 0031.62 DAC
 C 008 0039.42 DAC
 C 009 0039.20 DAC
 C 010 0039.73 DAC
 C 011 0036.12 DAC
 C 012 0039.39 DAC
 C 013 0039.05 DAC
 C 014 0033.31 DAC
 C 015 0039.07 DAC
 C 016 0036.67 DAC
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 C 018 0037.97 DAC
 C 019 0036.66 DAC
 C 020 0039.47 DAC
 C 021 0039.14 DAC
 C 022 0033.71 DAC
 C 023 0041.70 DAC
 C 024 0033.67 DAC
 C 025 0038.59 DAC
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 C 027 0039.42 DAC
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 C 029 0039.63 DAC
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 C 031 0039.59 DAC
 C 032 0039.41 DAC
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 C 035 0109.16 DAC
 C 036 0033.22 DAC
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 C 040 0036.58 DAC
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 C 042 0039.78 DAC
 C 043 0038.52 DAC
 C 044 0039.98 DAC
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 C 046 0036.77 DAC
 C 047 0031.04 DAC
 C 048 0039.93 DAC
 C 049 0035.60 DAC
 C 050 0037.85 DAC
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 C 060 0036.68 DAC

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 C 065 0036.56 DAC
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 C 067 0035.90 DAC
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 C 069 0037.07 DAC
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 C 071 0036.96 DAC
 C 072 0036.40 DAC
 C 073 0036.76 DAC
 C 074 0037.48 DAC
 C 075 0037.58 DAC
 C 076 0037.53 DAC
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 C 078 0036.74 DAC
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 C 081 0032.16 DAC
 C 082 0032.07 DAC
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 C 089 0036.24 DAC
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 C 093 0037.19 DAC
 C 094 0039.91 DAC
 C 095 0032.64 DAC
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 C 098 0037.09 DAC
 C 099 0037.8 DAC
 C 100 0036.6 DAC
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SCANS: 60.0000

UL T.C1 206.163

TRAVEL FACE: 31.2589

TRAVEL FACE: 43.2305

INNER COND 52.4997

OUTER COND 49.4262

S T 2 11199110.2
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 C 005 0039.20 DAC
 C 006 0035.50 DAC
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 C 008 0033.25 DAC
 C 009 0036.58 DAC
 C 010 0107.11 DAC
 C 011 0039.44 DAC
 C 012 0035.46 DAC
 C 013 0102.19 DAC
 C 014 0101.60 DAC
 C 015 0037.40 DAC
 C 016 0039.38 DAC
 C 017 0033.57 DAC
 C 018 0036.34 DAC
 C 019 0035.45 DAC
 C 020 0035.79 DAC
 C 021 0036.56 DAC
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 C 023 0039.37 DAC
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 C 025 0037.48 DAC
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 C 027 0038.64 DAC
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 C 030 0035.85 DAC
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 C 098 0036.4 DAC
 C 099 0038.3 DAC
 C 100 0036.1 DAC
 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NPC GL 86/10 SUPPLEMENT 1

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SCANNING: 45.0000
UL T.CS: 419.349
TRAYB FACE: 45.3249
TRAYB FACE: 45.4472
TRAYB FACE: 52.4422
TRAYB FACE: 61.3474
TRAYB COND: 52.4422
OUTER COND: 49.5263

SCANNING: 70.0000
UL T.CS: 430.044
TRAYB FACE: 107.315
TRAYB FACE: 107.667
TRAYB COND: 115.442
TRAYB COND: 113.030
OUTER COND: 110.782

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D T 2

S T 2 1115 110.2
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D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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SCANNING: 75.0000
 UL T.CS 738.424
 TRAV FACE: 119.802
 TRAV FACEV 117.942
 DIMER COND 131.785
 DIMER COND 128.985
 OUTER COND 128.105

SCANNING: 90.0000
 UL T.CS 745.610
 TRAV FACE: 125.569
 TRAV FACEV 131.785
 DIMER COND 145.672
 DIMER COND 132.985
 OUTER COND 145.088

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 C 100 00926.2 dnc
 D T 2

S T 2 12104110.2
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 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
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SCRAPE TIME: 55.0000

UL T/CI 953.917

TRAVEL FACE: 151.375

TRAVEL FACE: 147.246

INNER LEND 145.35

OUTER LEND 141.646

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 D T 2

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
 TESTS ON DARMATT KM1 FIRE PROTECTION
 SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
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SCREENS: 90.0000
 UL TCS 980.8TT
 TR/B FACE: 167.6V2
 TR/B FACE: 163.150
 INREF COND 125.923
 OUTER COND 178.06T

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 025 0109.39 D9C
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 027 0151.75 D9C
 028 0118.03 D9C
 029 0107.16 D9C
 030 0100.42 D9C
 031 0173.43 D9C
 032 0174.23 D9C
 033 0173.00 D9C
 034 0166.93 D9C
 035 0149.55 D9C
 036 0176.44 D9C
 037 0189.30 D9C
 038 0170.41 D9C
 039 0105.41 D9C
 040 0177.96 D9C
 041 0180.45 D9C
 042 0184.34 D9C
 043 0189.29 D9C
 044 0189.91 D9C
 045 0120.79 D9C
 046 0096.83 D9C
 047 0096.10 D9C
 048 0161.69 D9C
 049 0182.29 D9C
 050 0193.86 D9C
 051 0196.79 D9C
 052 0020.50 D9C
 053 0193.25 D9C
 054 0192.14 D9C
 055 0187.46 D9C
 056 0188.69 D9C
 057 0180.70 D9C
 058 0176.19 D9C
 059 0178.75 D9C
 060 0192.69 D9C

061 0197.08 D9C
 062 0199.20 D9C
 063 0199.81 D9C
 064 0201.11 D9C
 065 0202.40 D9C
 066 0203.64 D9C
 067 0197.31 D9C
 068 0179.26 D9C
 069 0114.20 D9C
 070 0095.17 D9C
 071 0160.20 D9C
 072 0185.61 D9C
 073 0196.22 D9C
 074 0200.71 D9C
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 076 0199.20 D9C
 077 0195.33 D9C
 078 0189.07 D9C
 079 0189.31 D9C
 080 0178.12 D9C
 081 0178.65 D9C
 082 0169.52 D9C
 083 0191.76 D9C
 084 0197.61 D9C
 085 0198.64 D9C
 086 0037.50 D9C
 087 0202.47 D9C
 088 0205.14 D9C
 089 0206.53 D9C
 090 0202.30 D9C
 091 0186.30 D9C
 092 0133.49 D9C
 093 00995.20 D9C
 094 00976.4 D9C
 095 00961.2 D9C
 096 00971.6 D9C
 097 00950.2 D9C
 098 00942.8 D9C
 099 00941.2 D9C
 100 00940.2 D9C
 D T 2

TEST RECORD FAVERDALE TECHNOLOGY

ABSTRACT No: 31-0076
 RIG NAME: DARMATT KM1 - 12" CABLE TRAY B (12")
 TEST SPECIFICATION: ASTM E119 (1993) - 0076 (1)
 SIGNATURE: *[Signature]*
 DATE: 27/3/94

APPENDIX E

Photographic Record

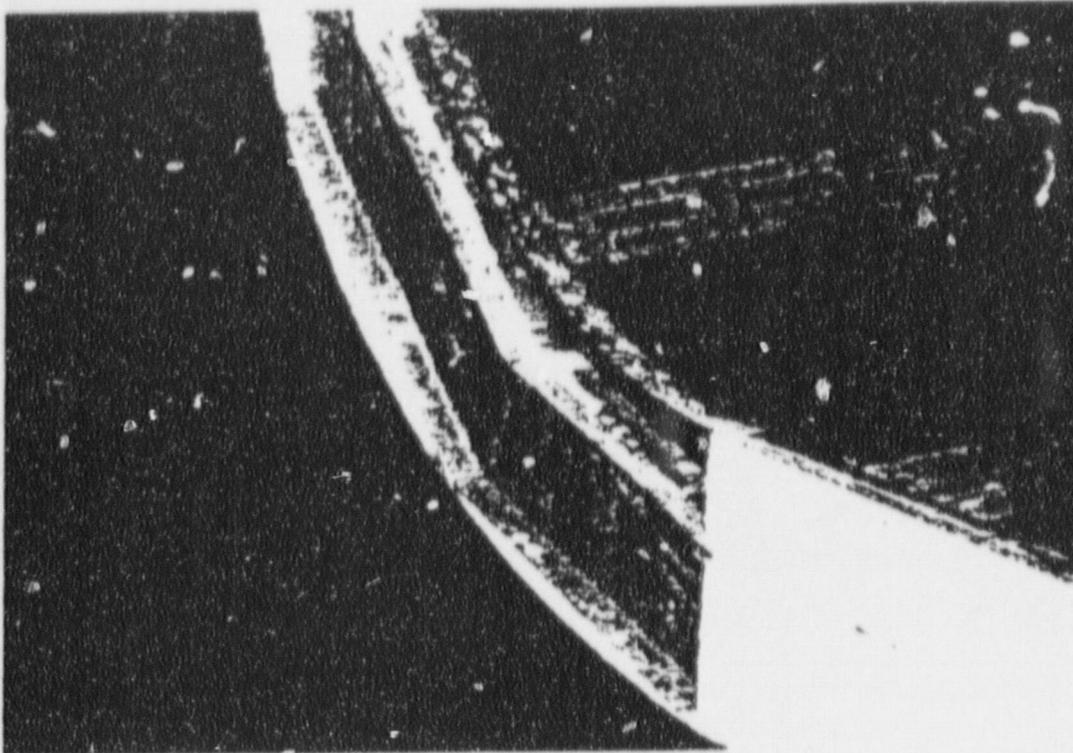
- Frame 1 - 36" x 6" Cable Tray - side insulation
- Frame 2 - 36" x 6" Cable Tray - partially insulated
- Frame 3 - 36" x 6" Cable Tray - central support (Unistrut)
- Frame 4 - 36" x 6" Cable Tray - installed in furnace prior to test
- Frame 5 - 12" x 3½" Cable Tray - partially insulated
- Frame 6 - 12" x 3½" Cable Tray - outer cover being applied
- Frame 7 - ¾" Conduit - premoulded insulation applied to bend
- Frame 8 - 12" x 3½" Cable Tray plus ¾" Conduit installed in furnace
- Frame 9 - General view of Cable Trays sited in furnace.

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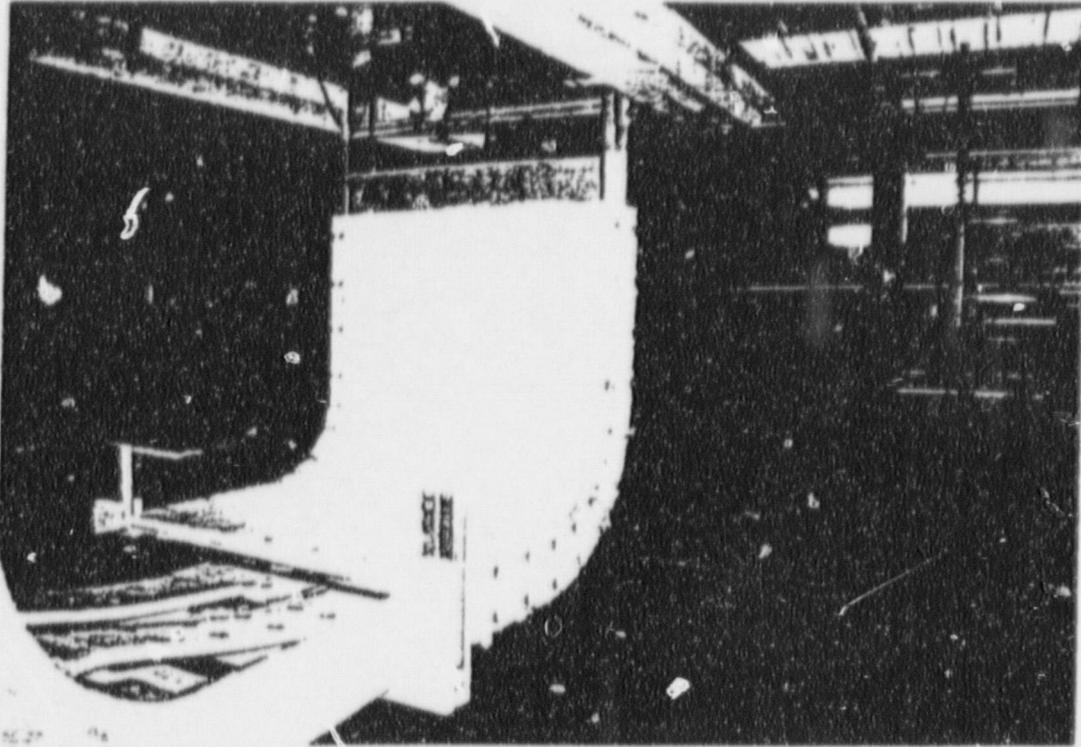
Frame 1 - 36' x 6" Cable Tray - side insulation

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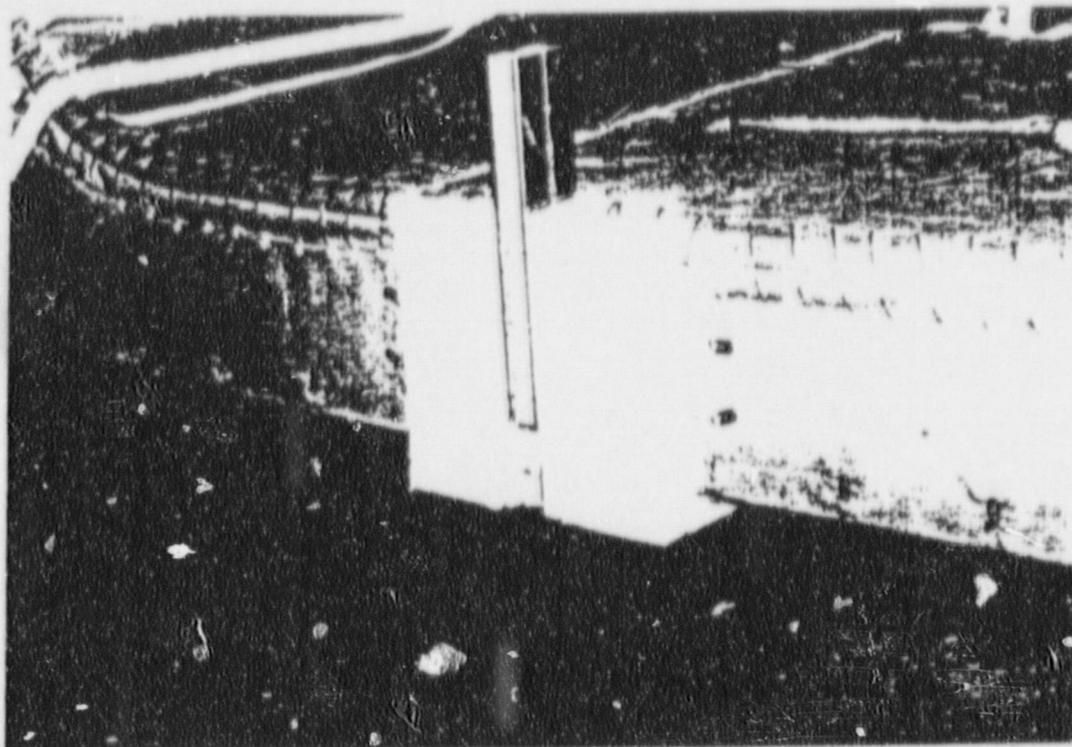
Frame 2 - 36" x 6" Cable Tray - partially insulated

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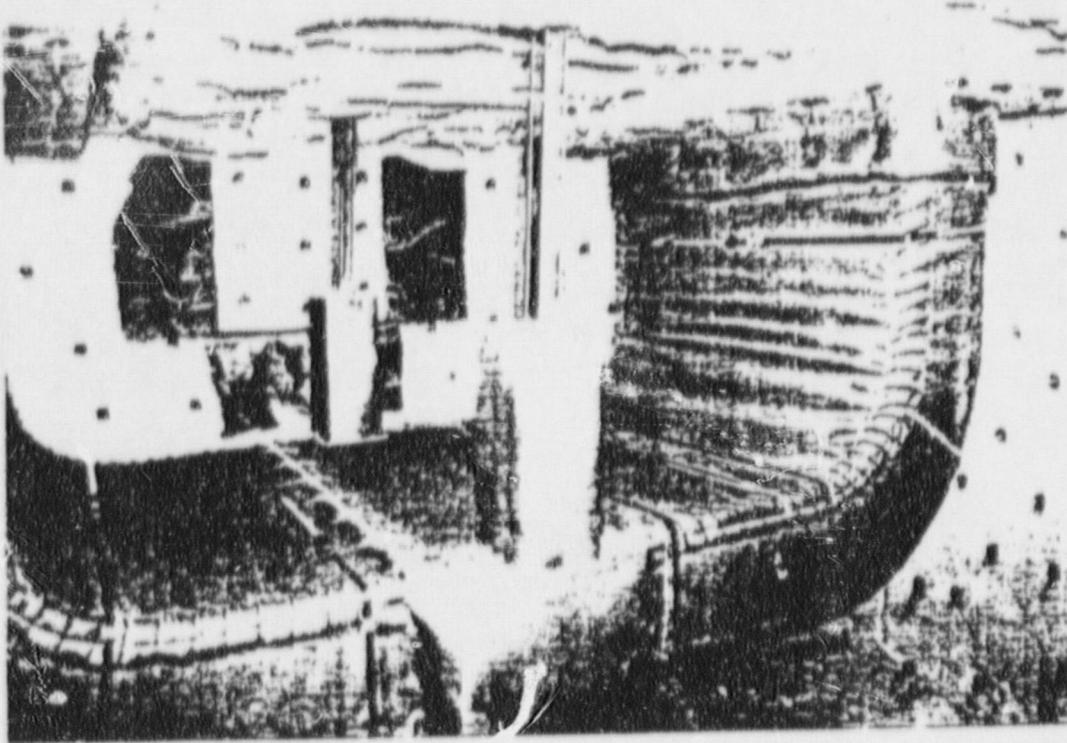
Frame 3 - 36" x 6" Cable Tray - central support (Unistrut)

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Frame 4 - 36" x 6" Cable Tray - installed in furnace prior to test

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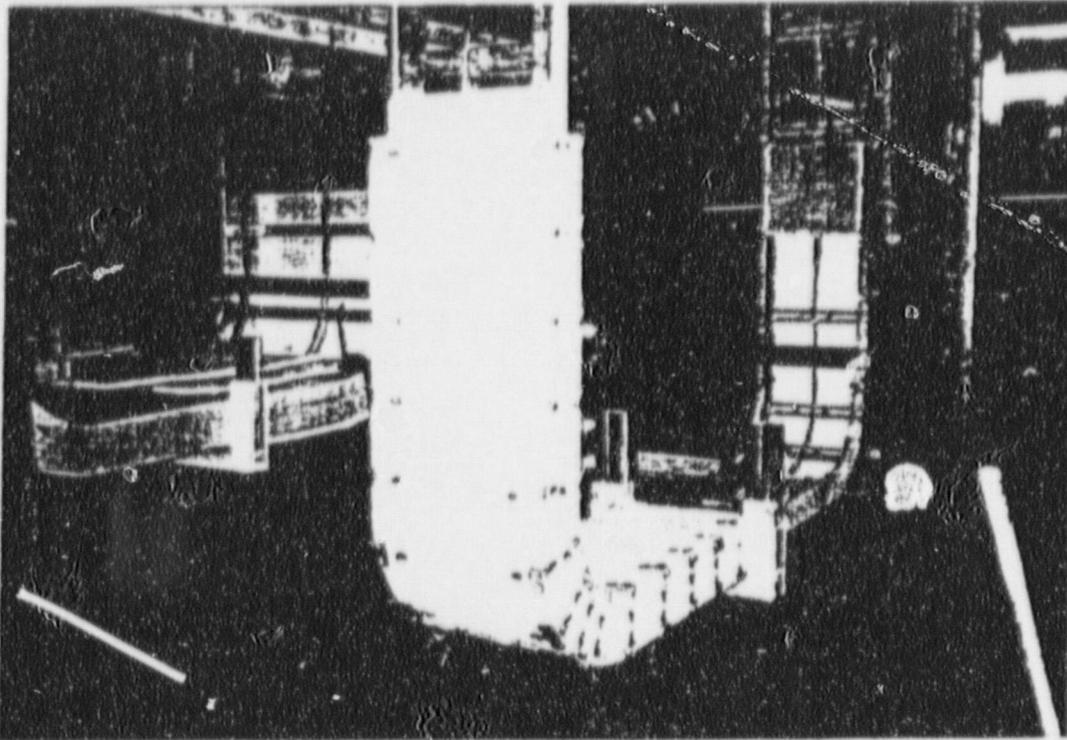


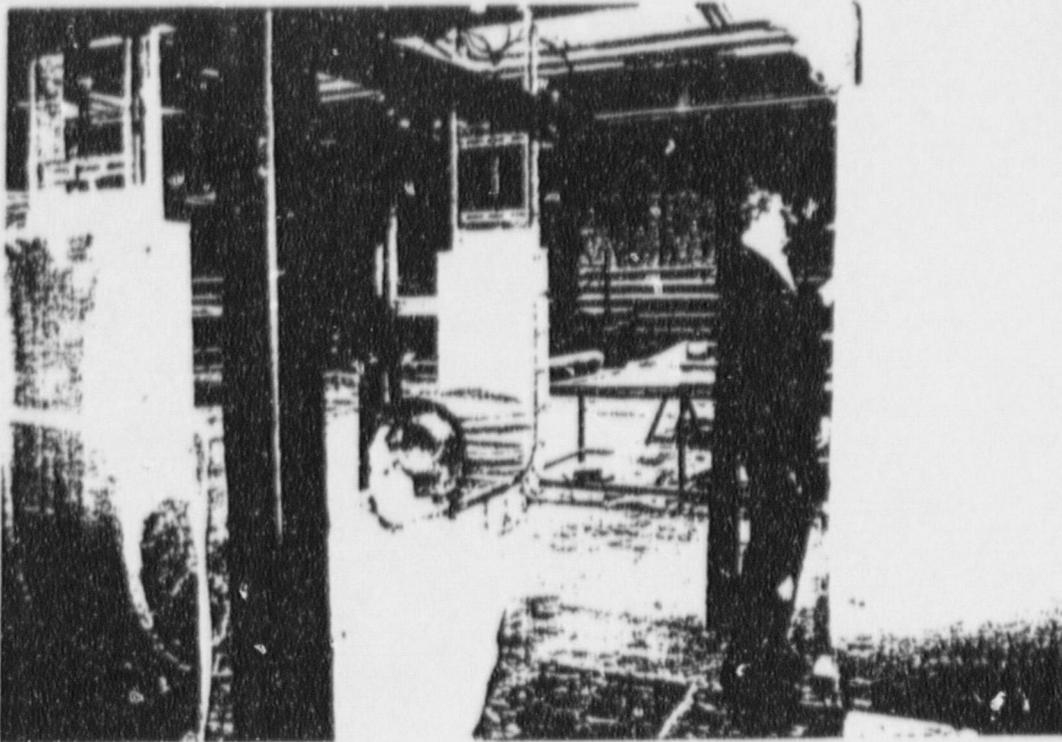
Figure 5 - 12" x 3½" Cable Tray - partially insulated

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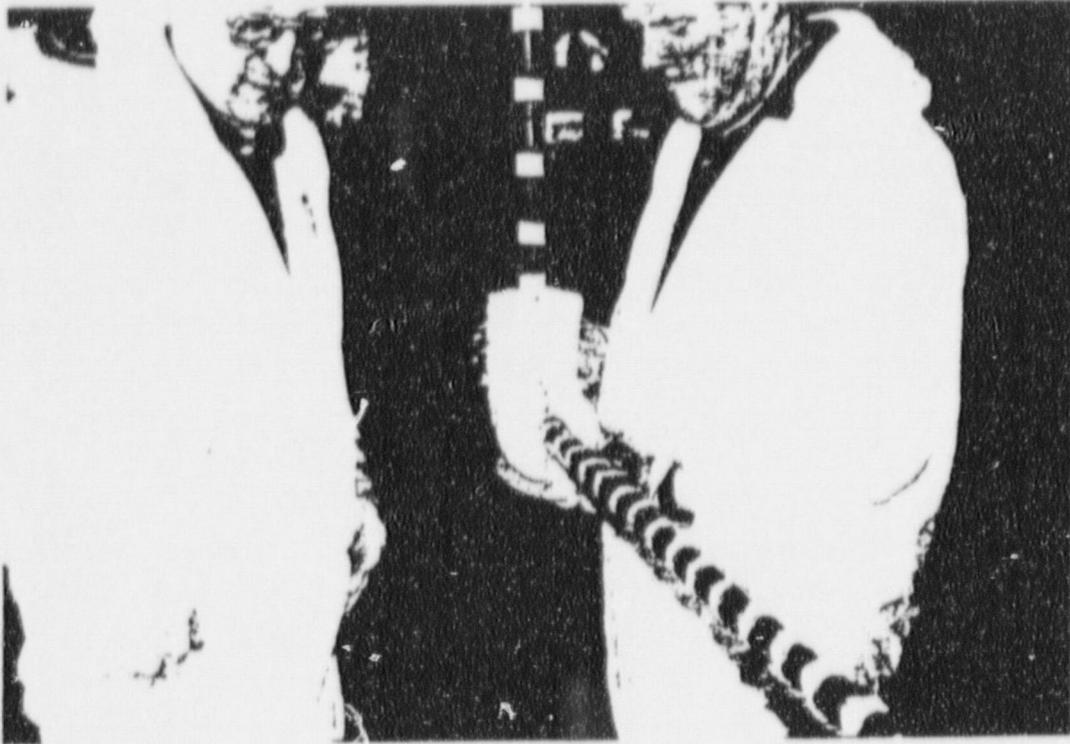
Frame 6 - 12" x 3 1/2" Cable Tray - outer cover being applied

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
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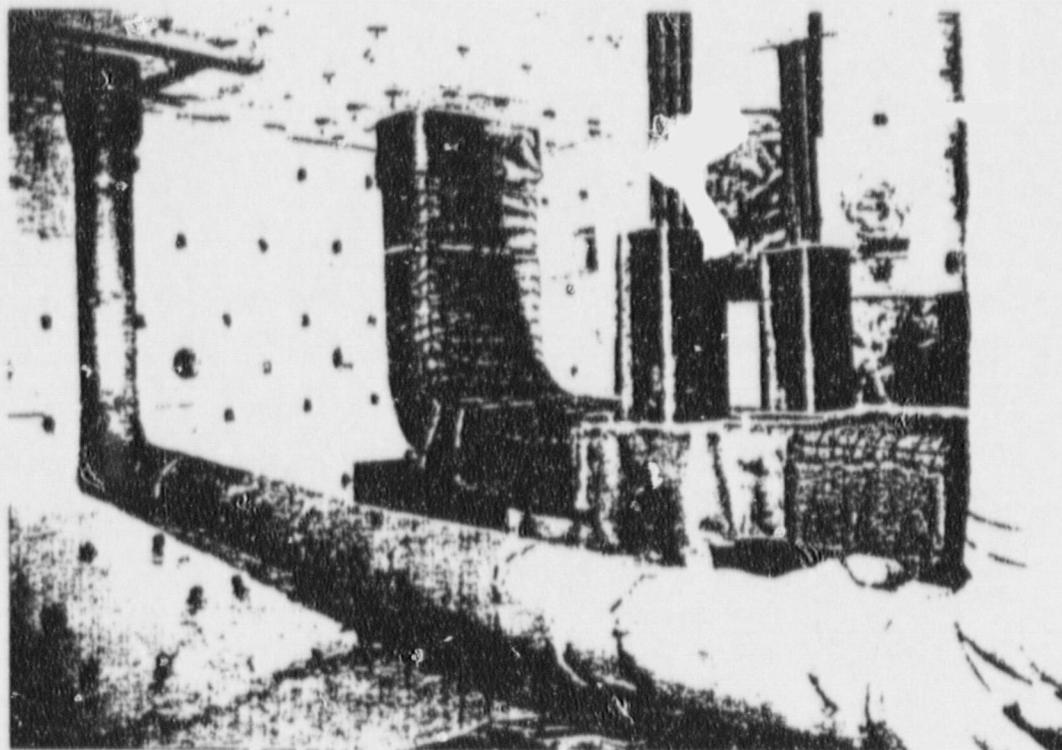
Frame 7 - 3/4" Conduit - pre-moulded insulation applied to bend

TEST REPORT FOR 1 HOUR FIRE HCSE STREAM
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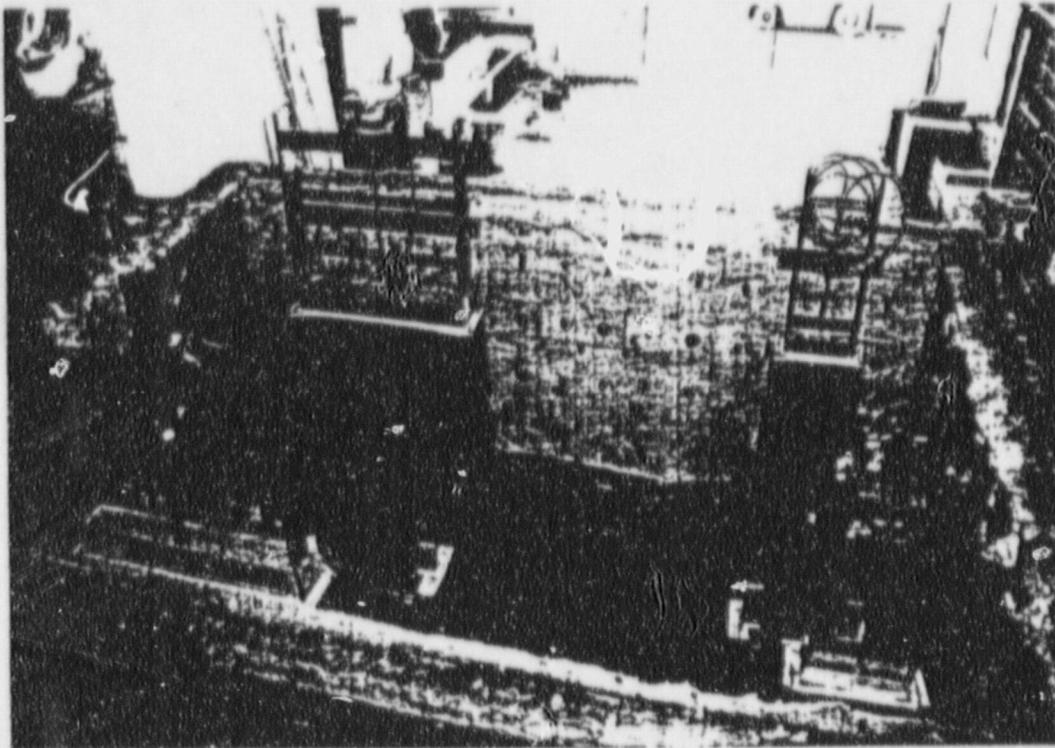
Frame 8 - 12" x 3½" Cable Tray - plus ¾" Conduit installed in furn

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Frame 9 - General view of Cable Trays sited in Furnace

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ADDENDUM 1

WATER HOSE STREAM TEST

1 INTRODUCTION

This addendum describes the performance of the developed Darmatt electrical circuit protective system when subjected to fire test conditions followed by a water hose stream test.

The Darmatt KM1 system was heated according to the UL 1724 (ASTM E119) time/temperature curve and then subjected to a water hose stream as detailed in ASTM E119 NRC GL 86-10 Supplement 1.

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM TESTS ON DARMATT KM1 FIRE PROTECTION SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1	DOCUMENT NO. FTCR/94/0060	
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2 DESCRIPTION OF THE TEST EQUIPMENT

2.1 Furnace

The fire test furnace consisted of a mild steel outer shell measuring approximately 2.0 metres high by 1.8 metres wide by 1.6 metres deep, and was lined to the inside with ceramic fibre.

The furnace is fired by 16 forced air/natural gas burners individually controlled at each burner, and collectively controlled at the control panel.

2.2 Raceway

The raceway was constructed from carbon steel and measured 915 mm wide by 150 mm deep (36" x 6").

2.3 Cables

The raceway had a 0% solid area cable fill.

3 SAMPLE DETAILS

The insulation applied to the raceway was of the same specification as that applied to the samples prepared for the fire test reported in Document No. FTCR/94/0060 ie 2 layers at nominal 16 mm thick.

The ends of the insulated raceway were protected by a 100 mm thick layer of ceramic fibre.

4 INSTRUMENTATION

4.1 Data Recorder

The data recorder used was a Solartron Scorpio Delta model. This is a multi-task data processing and recording device with an accuracy of 0.05°C.

4.2 Furnace Thermocouples

The furnace temperature was monitored and controlled with 4 symmetrically positioned thermocouples 1.6 mm diameter, metal sheathed type K, to BS 1041 and BS 4937 Part 4.

4.3 Test Sample Thermocouples

No sample thermocouples were employed.

4.4 Differential Pressure Measurement

The differential pressure was measured by an electrical manometer capable of reading pressure within an accuracy of 0.01 inch (2.5 Pa) of water.

The pressure measuring probe tips were manufactured from stainless steel or equivalent material.

5 CONTROL OF FIRE TESTS

The furnace was controlled to follow the ASTM E119 standard fire curve, the limits imposed were those stated in BS 476 part 20 1987.

The percentage deviation (p) of the mean furnace temperature/time curve from the standard temperature/time curve is given by:-

$$p = \frac{A - B}{x} \times 100$$

Where A is the area under the mean furnace temperature/time curve, B is the area under the specified standard temperature/time curve.

A computer programme using Simpsons Rule was used to show the limits on deviation between the measured temperature and the standard temperature/time curve.

(i) Tolerance

Measured furnace temperature deviations were within the following limits.

- (a) Less than 15% to the end of the first 10 minutes of the heating period or to the end of the test if this is less than 10 minutes.
- (b) Less than 10% from 10 minutes into the test to the end of 30 minutes into the heating period.
- (c) Less than 5% from 30 minutes into the test to the end of the fire test.

(ii) Uniformity of Temperature Distribution

At any time after the first 10 minutes of the heating period, the temperature rise indicated by any of the thermocouples used to determine the mean furnace temperatures did not differ from the corresponding temperature rise given by the standard temperature/time curve by more than 100°C.

6 TEST PROCEDURE

6.1 Installation of the Raceway and Protective System

The raceway was supported from a free-standing steel wall which was lined with ceramic fibre. After the electrical circuit protective system was applied, the free ends were protected with 100 mm thickness of ceramic fibre.

The periphery of the test sample was no closer than 305 mm from the furnace edge.

The furnace was positioned against the free-standing wall, enclosing the test sample.

6.2 Furnace Ignition and Control

After all instrumentation had been checked for functionality, the burners were ignited and the mean of the four furnace thermocouples controlled to match as closely as possible the UL 1724 (ASTM E119) standard fire curve.

6.3 Test Readings

The mean furnace temperature was displayed to screen continuously, and the mean and individual thermocouple readings were printed to paper at the following intervals:-

0 - 10 minutes	1 minute intervals
10 - 30 minutes	2 minute intervals
30 minutes on	5 minute intervals

6.4 Duration of the Fire Test

The sample was subjected to two heating/hose stream tests; a 30 minute duration heating test on 29 March 1994 followed by a hose stream test and a 60 minute duration heating test on 16 May 1994 followed by a hose stream test. The test sample was dried between the two tests.

6.5 Hose Stream Test

Immediately following the fire test, the furnace surrounding the test sample was removed and the sample subjected to a hose stream. The hose steam was directed at the centre of the cable tray then slowly traversed over the whole sample for a period of 5 minutes.

The hose stream was discharged from a 2½" hose with a 1½" nozzle at a 30° divergent angle, at a distance of 5 ft from the centre point of the sample. The pressure at the base of the nozzle was maintained at 75 psi and had a discharge rate of at least 75 gpm.

The nozzle pressure was monitored at the start and cessation of the hose stream test and the spray angle and discharge rate were verified by Mr J Behn (Commonwealth Edison) for the test carried out on 29 March 1994.

6.6 Pass/Failure Criteria

The electrical circuit protective system must retain its integrity after the hose stream test.

7 TEST RESULTS

- 7.1 A 30 minute heating test followed by a 5 minute hose stream test was conducted on 29 March 1994 and was witnessed by Mr J Behn (Commonwealth Edison).
- 7.2 The sample was dried and a 60 minute heating test followed by a 5 minute hose stream test was conducted on 16 May 1994.

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8 OBSERVATIONS

The test sample had retained its integrity after both hose stream tests and was deemed to have satisfied the criteria detailed in ASTM E119 NRC GL 86-10 Supplement 1.

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FIRE ACCURACY CHECK DATA

GRAPH OF MEAN FURNACE TEMPERATURE AGAINST TIME

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11-0106

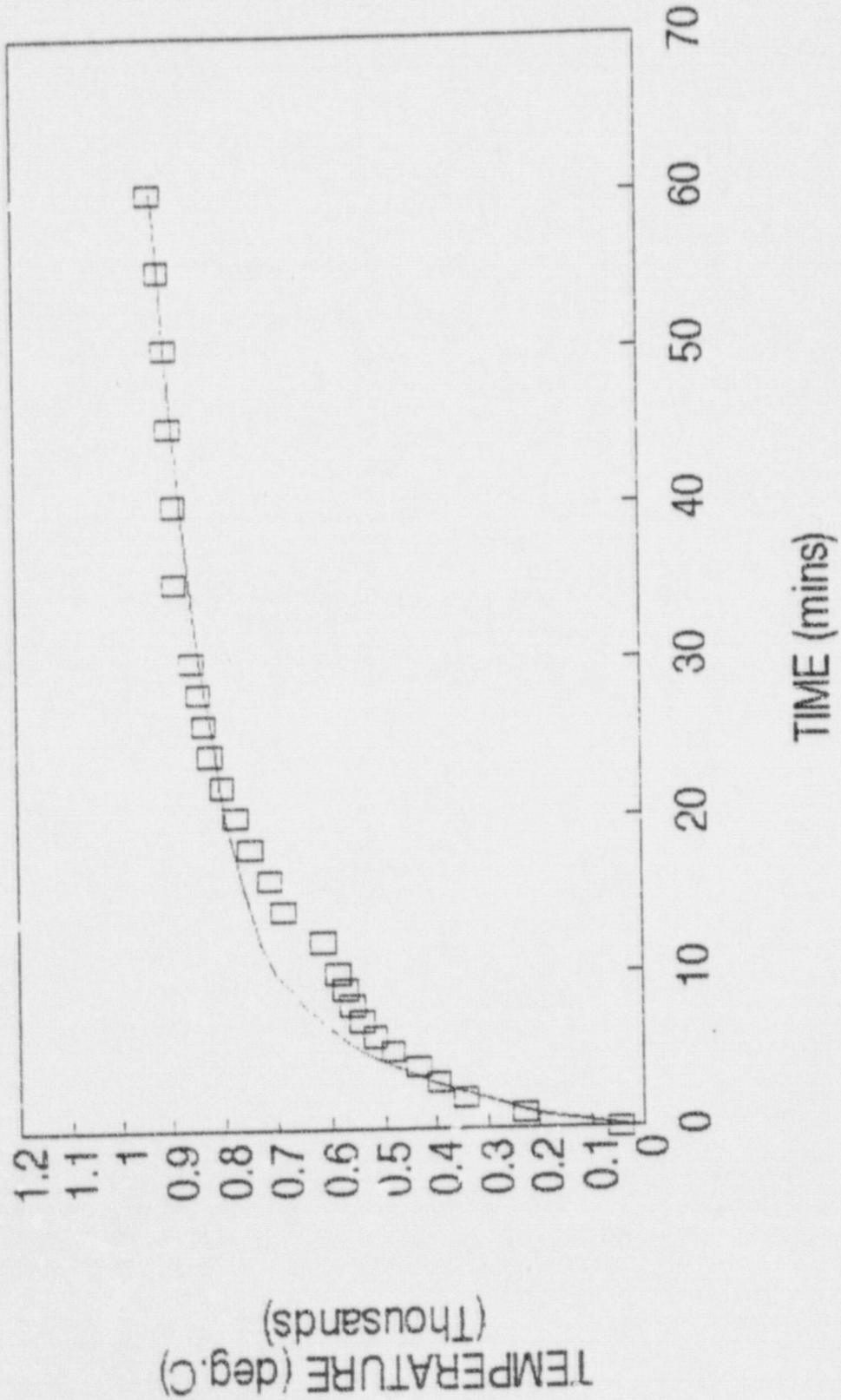
KM1 DARMATT - HOSE STREAM TEST

16/05/94

Simpson's Rule Numerical Integration

Time, min.	TEST DATA		ASTM E119 Firecurve		limits
	Temp.	Cum. °C-min.	Temp.	Cum. °C-min.	
0	45		20		
1	227		200		
2	344		300		
3	396		400		
4	434		470		
5	493		538		
6	517		592		
7	542		618		
8	560		650		
9	573		675		4095
10	587	4409	704	4817	
12	614		732		5540
14	639		750		
16	714		767		
18	749		781		
20	777		795		
22	801		805		
24	823		814		
26	835		824		
28	845		833		18514
30	858	19532	843	20571	
35	890		862		22628
40	889		878		
45	898		892		36199
50	905	37354	905	38105	
55	916		916		40010
60	931		927		

ASTM E119 STANDARD FIRE CURVE
KM DARMATT - 1 HR FIRE/HOSE STREAM TEST



TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
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COMPLETE DATA PRINTOUTS OF THERMOCOUPLE READINGS

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RUN 13:10:10 13-05

SCAN (MINS) 0

FURNACE 45.2018

S T 1 13:12:41.3
 C 001 0049.99 deC
 C 002 0039.00 deC
 C 003 0071.10 deC
 C 004 0040.70 deC
 D T 1

SCAN (MINS) 1.00000

FURNACE 127.053

S T 1 13:13:41.3
 C 001 0268.01 deC
 C 002 0181.27 deC
 C 003 0236.99 deC
 C 004 0223.93 deC
 D T 1

SCAN (MINS) 2.00000

FURNACE 344.193

S T 1 13:14:41.3
 C 001 0396.34 deC
 C 002 0289.79 deC
 C 003 0354.85 deC
 C 004 0337.00 deC
 D T 1

SCAN (MINS) 3.00000

FURNACE 395.677

S T 1 13:15:41.3
 C 001 0445.72 deC
 C 002 0344.75 deC
 C 003 0407.89 deC
 C 004 0384.53 deC
 D T 1

SCAN (MINS) 4.00000

FURNACE 433.734

S 1 13:16:41.3
 1 0402.83 deC
 2 0387.24 deC
 3 0447.38 deC
 4 0417.88 deC
 D T 1

SCAN (MINS) 5.00000

FURNACE 462.299

S T 1 13:17:41.3
 C 001 0503.75 deC
 C 002 0497.19 deC
 C 003 0493.16 deC
 C 004 0464.40 deC
 D T 1

SCAN (MINS) 6.00000

FURNACE 516.692

S T 1 13:18:41.3
 C 001 0569.84 deC
 C 002 0478.43 deC
 C 003 0529.82 deC
 C 004 0496.84 deC
 D T 1

SCAN (MINS) 7.00000

FURNACE 541.865

S T 1 13:19:41.3
 C 001 0585.80 deC
 C 002 0504.92 deC
 C 003 0554.78 deC
 C 004 0522.84 deC
 D T 1

SCAN (MINS) 8.00000

FURNACE 559.918

S T 1 13:20:41.3
 C 001 0601.86 deC
 C 002 0526.47 deC
 C 003 0573.11 deC
 C 004 0539.01 deC
 D T 1

SCAN (MINS) 9.00000

FURNACE 572.849

S T 1 13:21:41.3
 C 001 0618.85 deC
 C 002 0539.44 deC
 C 003 0587.53 deC
 C 004 0554.37 deC
 D T 1

SCAN (MINS) 10.00000

FURNACE 586.994

S T 2 13:22:41.3
 C 001 0628.87 deC
 C 002 0598.07 deC
 C 003 0598.79 deC
 C 004 0587.73 deC
 D T 2

SCAN (MINS) 12.00000

FURNACE 613.982

S T 2 13:24:41.3
 C 001 0647.51 deC
 C 002 0583.91 deC
 C 003 0629.77 deC
 C 004 0594.72 deC
 D T 2

SCAN (MINS) 14.00000

FURNACE 668.772

S T 2 13:26:41.3
 C 001 06712.4 deC
 C 002 0656.24 deC
 C 003 06708.0 deC
 C 004 06678.3 deC
 D T 2

SCAN (MINS) 16.00000

FURNACE 714.187

S T 2 13:28:41.3
 C 001 06741.1 deC
 C 002 06689.0 deC
 C 003 06728.3 deC
 C 004 06697.8 deC
 D T 2

SCAN (MINS) 18.00000

FURNACE 749.189

S T 2 13:30:41.3
 C 001 06772.7 deC
 C 002 06724.3 deC
 C 003 06765.4 deC
 C 004 06734.2 deC
 D T 2

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SCAN (MINS) 20.0000

FURNACE 778.212

S T 2 10:10:41.0
 C 001 007042.0 d9C
 C 002 007048.0 d9C
 C 003 007054.0 d9C
 C 004 007060.0 d9C
 D T 2

SCAN (MINS) 30.0000

FURNACE 487.789

S T 3 10:11:20.0
 C 001 008012.0 d9C
 C 002 008018.0 d9C
 C 003 008024.0 d9C
 C 004 008030.0 d9C
 D T 3

SCAN (MINS) 35.0000

FURNACE 916.432

S T 3 10:10:41.0
 C 001 009194.0 d9C
 C 002 009200.0 d9C
 C 003 009206.0 d9C
 C 004 009212.0 d9C
 D T 3

SCAN (MINS) 22.0000

FURNACE 688.732

S T 2 10:12:41.0
 C 001 007822.0 d9C
 C 002 007777.0 d9C
 C 003 008116.0 d9C
 C 004 007808.0 d9C
 D T 2

SCAN (MINS) 25.0000

FURNACE 689.922

S T 3 10:14:17.0
 C 001 009011.0 d9C
 C 002 009017.0 d9C
 C 003 009023.0 d9C
 C 004 009029.0 d9C
 D T 3

SCAN (MINS) 60.0000

FURNACE 930.511

S T 3 14:10:41.0
 C 001 009308.0 d9C
 C 002 009314.0 d9C
 C 003 009320.0 d9C
 C 004 009326.0 d9C
 D T 3

SCAN (MINS) 24.0000

FURNACE 820.339

S T 2 10:36:41.0
 C 001 008444.0 d9C
 C 002 008500.0 d9C
 C 003 008539.0 d9C
 C 004 008508.0 d9C
 D T 2

SCAN (MINS) 40.0000

FURNACE 689.409

S T 3 10:56:41.0
 C 001 009003.0 d9C
 C 002 009009.0 d9C
 C 003 009015.0 d9C
 C 004 009021.0 d9C
 D T 3

SCAN (MINS) 26.0000

FURNACE 835.283

S T 2 10:38:41.0
 C 001 008522.0 d9C
 C 002 008511.0 d9C
 C 003 008522.0 d9C
 C 004 008524.0 d9C
 D T 2

SCAN (MINS) 45.0000

FURNACE 896.315

S T 3 10:57:41.0
 C 001 009027.0 d9C
 C 002 008728.0 d9C
 C 003 009412.0 d9C
 C 004 008999.0 d9C
 D T 3

SCAN (MINS) 28.0000

FURNACE 945.884

S T 2 10:40:41.0
 C 001 008880.0 d9C
 C 002 008823.0 d9C
 C 003 008882.0 d9C
 C 004 008835.0 d9C
 D T 2

SCAN (MINS) 50.0000

FURNACE 904.831

S T 3 14:02:41.0
 C 001 009081.0 d9C
 C 002 008881.0 d9C
 C 003 009170.0 d9C
 C 004 009080.0 d9C
 D T 3

TEST RECORD FAVERDALE TECHNOLOGY

CENTRE LTD

ABSTRACT No: 31-01.0b

RIG NAME: KM1 DARMATT - 1hr fire test + hose stream

TEST SPECIFICATION: E119 Fire Curve

SIGNATURE: S. Paddy

DATE: 16/5/94

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PHOTOGRAPHIC RECORD

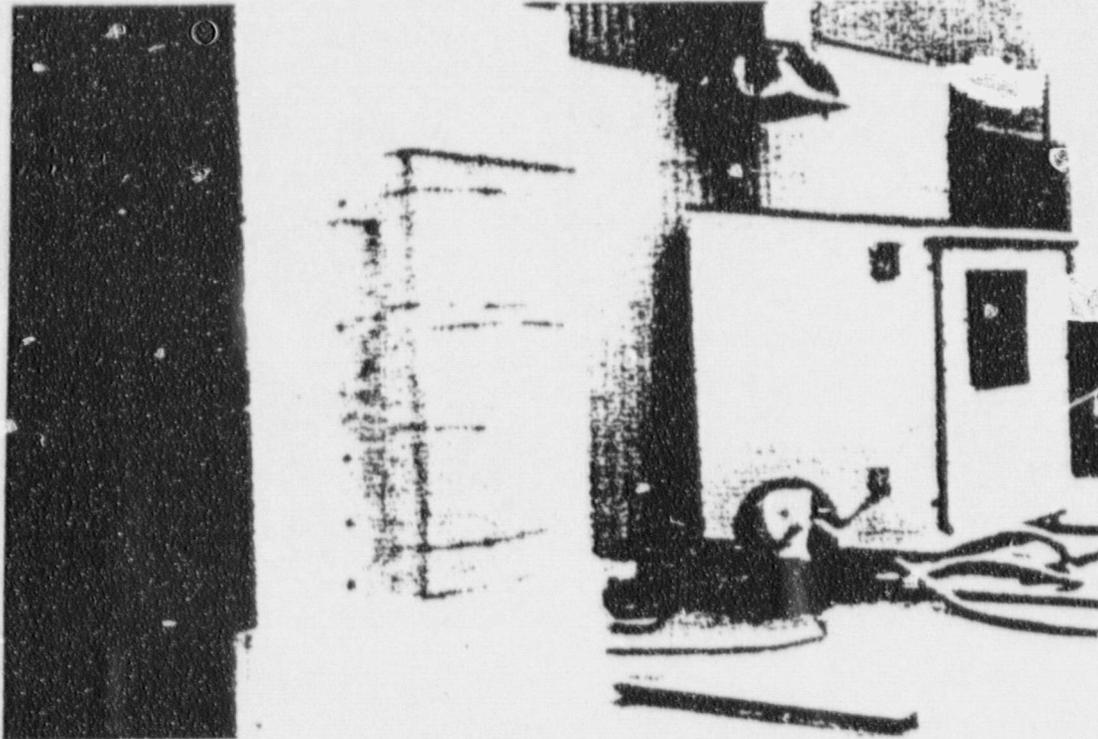
- Frame 1 - Pre-test
- Frame 2 - During hose stream test
- Frame 3 - During hose stream test

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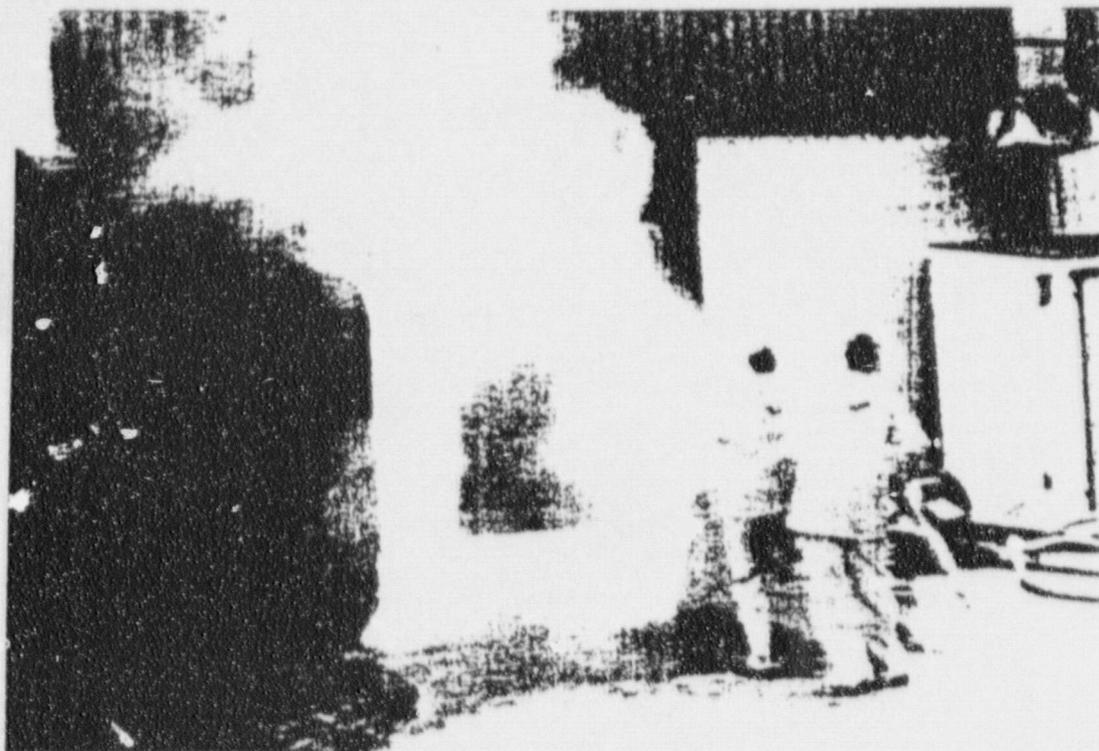
Frame 1 - Pre-test

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KM1 FIRE PROTECTION
SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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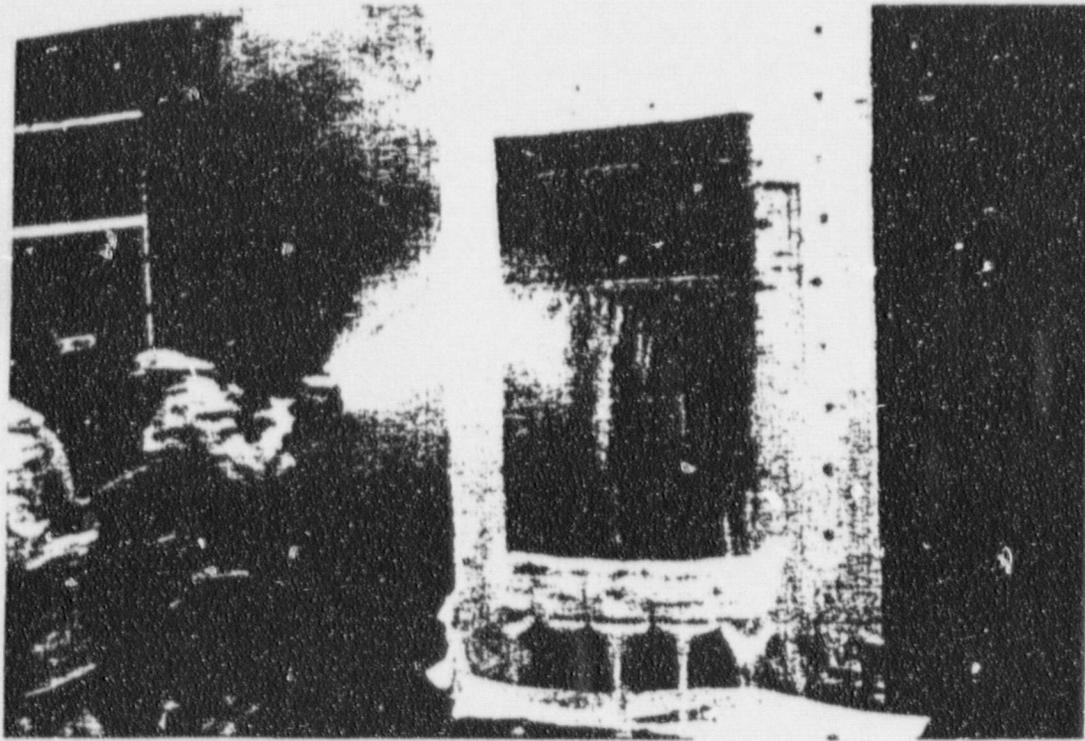
Frame 2 - During Hose Stream Test

TEST REPORT FOR 1 HOUR FIRE HOSE STREAM
TESTS ON DARMATT KM1 FIRE PROTECTION
SYSTEM FOR ELECTRICAL CIRCUITS SYSTEMS
TO ASTM E119 NRC GL 86/10 SUPPLEMENT 1

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Frame 3 - During Hose Stream Test