



Northern States Power Company

Prairie Island Nuclear Generating Plant

1717 Wakonade Dr. East
Welch, Minnesota 55089

November 2, 1998

U S Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

**Response to Request for Additional Information Concerning the Prairie Island
Nuclear Generating Plant Request for Exemption from 10 CFR Part 50,
Appendix R, Section III.G.2, "Fire Protection of Safe Shutdown Capabilities"**

By letters dated August 14, 1997, and April 16, 1998, Northern States Power Company (NSP) requested exemptions from the technical requirements of Section III.G.2 of 10 CFR Part 50, Appendix R. By letter dated September 17, 1998, the NRC requested additional information concerning this exemption request. Attachment 1 to this letter is NSP's response to the NRC Request for Additional Information.

In this letter we have made no new Nuclear Regulatory Commission commitments. Please contact Jeff Kivi (651-388-1121) if you have any questions related to this letter.

Joel P. Sorensen
Plant Manager
Prairie Island Nuclear Generating Plant

A0061/

9811090055 981102
PDR ADOCK 05000282
F PDR

c: Regional Administrator - Region III, NRC
Senior Resident Inspector, NRC
NRR Project Manager, NRC
J E Silberg

Attachments:

1. Response to Request for Additional Information Concerning the Prairie Island Nuclear Generating Plant Request for Exemption from 10 CFR Part 50, Appendix R, Section III.G.2, "Fire Protection of Safe Shutdown Capabilities"
2. Installation Detail Drawings Associated with Each Installation of the Rockbestos Firezone R Cable
3. Rockbestos Firezone R Cable Routing Sketches
4. Letter from Rockbestos dated October 27, 1998
5. Manufacturers Catalog Specification Sheet

ATTACHMENT 1

Response to Request for Additional Information Concerning the Prairie Island Nuclear
Generating Plant Request for Exemption from 10 CFR Part 50, Appendix R, Section
III.G.2, "Fire Protection of Safe Shutdown Capabilities"

Question 1: *Provide detail drawings or diagrams that depict the routing of the Firezone R cables and the basic features (equipment, storage, components, etc.) of the fire areas through which the Firezone R cables will pass. Provide a detailed description of the configuration that the Firezone R cable will be in, the type of the cable (e.g., 3C14 AWG), and the expected service loads that will be required of the cables (voltage and current). State the function of each cable, i.e., power, control, or instrumentation.*

Presently, 10 control circuit cables required for safe shutdown are routed using Rockbestos Firezone R cable. Per the definition of control cables used at Prairie Island all control cables are a nominal 120/125 volts (AC or DC) and 30 amps or less. All presently installed Firezone R cables are 1-7/C-14 AWG stainless steel armored cable. Refer to attached manufacturers catalog specification sheet [Attachment 5] for specific construction details of the cable. The following table describes the basic application for each present installation:

Cable No.	Application	Fire Area	Voltage	Max. Current*
1CA-1133	Pressurizer PORV SV-31232	FA 59	125 VDC	5 amps
1CB-928	Pressurizer PORV SV-32231	FA 59	125 VDC	5 amps
2CA-522	Pressurizer PORV SV-31234	FA 74	125 VDC	5 amps
2CB-472	Pressurizer PORV SV-31233	FA 74	125 VDC	5 amps
1K1-21A	12 Charging Pump.	FA 58	120 VAC	4 amps
1CA-91	12 Charging Pump.	FA 58	120 VAC	4 amps
1CA-92	12 Charging Pump.	FA 58	120 VAC	4 amps
2K1-5A	22 Charging Pump.	FA 73	120 VAC	5 amps
2CA-148	22 Charging Pump.	FA 73	120 VAC	5 amps
2CA-162	22 Charging Pump.	FA 73	120 VAC	5 amps

*Based on fuse protection.

Refer to attached installation detail drawings associated with each installation of the Rockbestos Firezone R cable [Attachment 2]. Each cable is installed in steel conduit through the fire area of concern. For clarity and greater detail, the approximate routing is also sketched on area layout drawings [Attachment 3]. Any potential future use of Firezone R cable in these areas as well as other areas for which exemption is requested is presently undefined.

The following is a brief description of each fire area:

Fire Area 58 (Zone 8) Auxiliary Building 695' elev. Unit 1 and Fire Area 73 (Zone 40) Auxiliary Building 695' elev. Unit 2:

1. Combustible Load:

Combustibles in this area include cable, pump oil, and miscellaneous material. The fire load in this area is Very Light. (less than 40,000 BTU/ft²)

2. Fire Detection:

Fire Detection in the area uses ion detectors in the ceiling area near the cable trays. Refer to fire area layout drawings in Attachment 3 for approximate number and location of detectors in the area (identified as a hexagon with the identifier "ion").

3. Fire Suppression:

Fire Suppression in the area is provided by manual suppression using CO₂ fire extinguishers and hose stations. Refer to fire area layout drawings in Attachment 3 for approximate number and location of fire suppression equipment in the area. Wet pipe sprinkler systems protect the elevator and stairwell areas.

4. Cable Susceptibility to Fire:

A fire in this area will be a low intensity. Cables are fire resistant IEEE 383 qualified cable. This limits the susceptibility of the cables to fire.

5. Redundant Train Susceptibility to Fire:

USAR required redundant cable tray train separation is maintained in the area. The area is highly compartmentalized. These factors limit the susceptibility of both trains to sustain damage in a single fire.

6. Existing Personnel Controls on the Area:

The Auxiliary Building Operator is stationed in this area and typically walks the area down at least twice per shift (four times per 24 hour period) to verify that all fire doors are closed, doors are free of obstruction, removal of combustible material, and any abnormal conditions. This is a vital area and a radiological controlled area with limited access for plant personnel.

7. Existing Administrative Controls on the Area:

Existing procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

Existing procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.

Fire Area 59 (Zone 19) Auxiliary Building 715' elev. Unit 1 and Fire Area 74 (Zone 46) Auxiliary Building 715' elev. Unit 2:

1. Combustible Loading:

Combustibles in this area include cable and miscellaneous material. The fire load in this area is Very Light. (less than 40,000 BTU/ft²)

2. Fire Detection:

Fire Detection in the area uses ion detectors in the ceiling area near the cable trays. Refer to fire area layout drawings in Attachment 3 for approximate number and location of detectors in the area (identified as a hexagon with the identifier "ion").

3. Fire Suppression:

Fire Suppression in the area is provided by manual suppression using CO2 fire extinguishers and hose stations. Refer to fire area layout drawings in Attachment 3 for approximate number and location of fire suppression equipment in the area. Wet pipe sprinkler systems protects the elevator, stairwell areas, penetration cabinets and the anti-C storage rack located on the Unit 1 side.

4. Cable Susceptibility to Fire:

A fire in this area will be a low intensity. Cables are fire resistant IEEE 383 qualified cable. This limits the susceptibility of the cables to fire.

5. Redundant Train Susceptibility to Fire:

USAR required redundant cable tray train separation is maintained in the area. This limits the susceptibility of both trains to sustain damage in a single fire.

6. Existing Personnel Controls on the Area:

The Auxiliary Building Operator is stationed in this area and typically walks the area down at least twice per shift (four times per 24 hour period) to verify that all fire doors are closed, doors are free of obstruction, removal of combustible material, and any abnormal conditions. This is a vital area and a radiological controlled area with limited access for plant personnel.

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Existing procedure 5AWI 3.13.2, Fire Preventive Practices, controls the intrusion of transient combustible material in safety related areas, identifies the requirements for Combustion Source Use Permits (CSUP) when the allowable level of transients are exceeded or an ignition source is used in a safety related area.

Existing procedure 5AWI 3.2.4, Conduct of Work, controls the conduct of work, the removal of fire protection equipment from service, consideration of equipment out of service or affected by NCR's, and the need for Pre-Job Briefings.

F5 Appendix K requires fire detection instruments to be operable in this area. If the detection criteria cannot be met for this area an hourly fire watch shall be established until detection is restored.

Question 2: The Underwriters Laboratories (UL) test report on Rockbestos Firezone R Cable did not state the test standard to which it was conducted, the acceptance criteria for the tested cables, or include a detailed test plan or test protocol. Please provide these elements.

Refer to attached letter from Rockbestos dated October 27, 1998.

Question 3: The UL test further states that leakage current measurements were taken during the full-scale fire test of the Rockbestos cable. The numerical results of the leakage current measurements were not recorded in the report. Provide the numerical values for leakage current in the Firezone R cables that were monitored during the test.

Refer to attached letter from Rockbestos dated October 27, 1998.

Question 4: *The UL fire test tested specific sizes of instrument and power Firezone R cables. Demonstrate how the sizes of Firezone R control cables, which you propose to install, are bounded by the test.*

Refer to attached letter from Rockbestos dated October 27, 1998.

Question 5: *State whether there are any non-continuous cable runs of Firezone R cable (i.e., splices) in the proposed applications, and if so, justify how they are bounded by the UL fire test.*

All existing installations of Rockbestos Firezone R cable are continuous runs devoid of splices within the fire area of concern.

Question 6: *Provide clarification as to how the fire test report FCT/94/0060 from Darchem Industries (Attachment 3 to your submittal) demonstrates that the use of unprotected unistrut for raceway support is acceptable.*

The referenced fire test report (FCTR/94/0060) is a typical fire test conducted by Darchem Engineering for qualification of various configurations of Darmatt KM1 Fire Barrier material to ASTM 119 per the requirements of GL 86-10, Supplement 1. It was not specifically a test of the unistrut support systems, however the ability of an unprotected unistrut support to meet the design criteria of GL 86-10, Supplement 1, can easily be inferred by the results of this test.

On page 11 of the test report, section 6.1 describing the installation of the electrical raceway states:

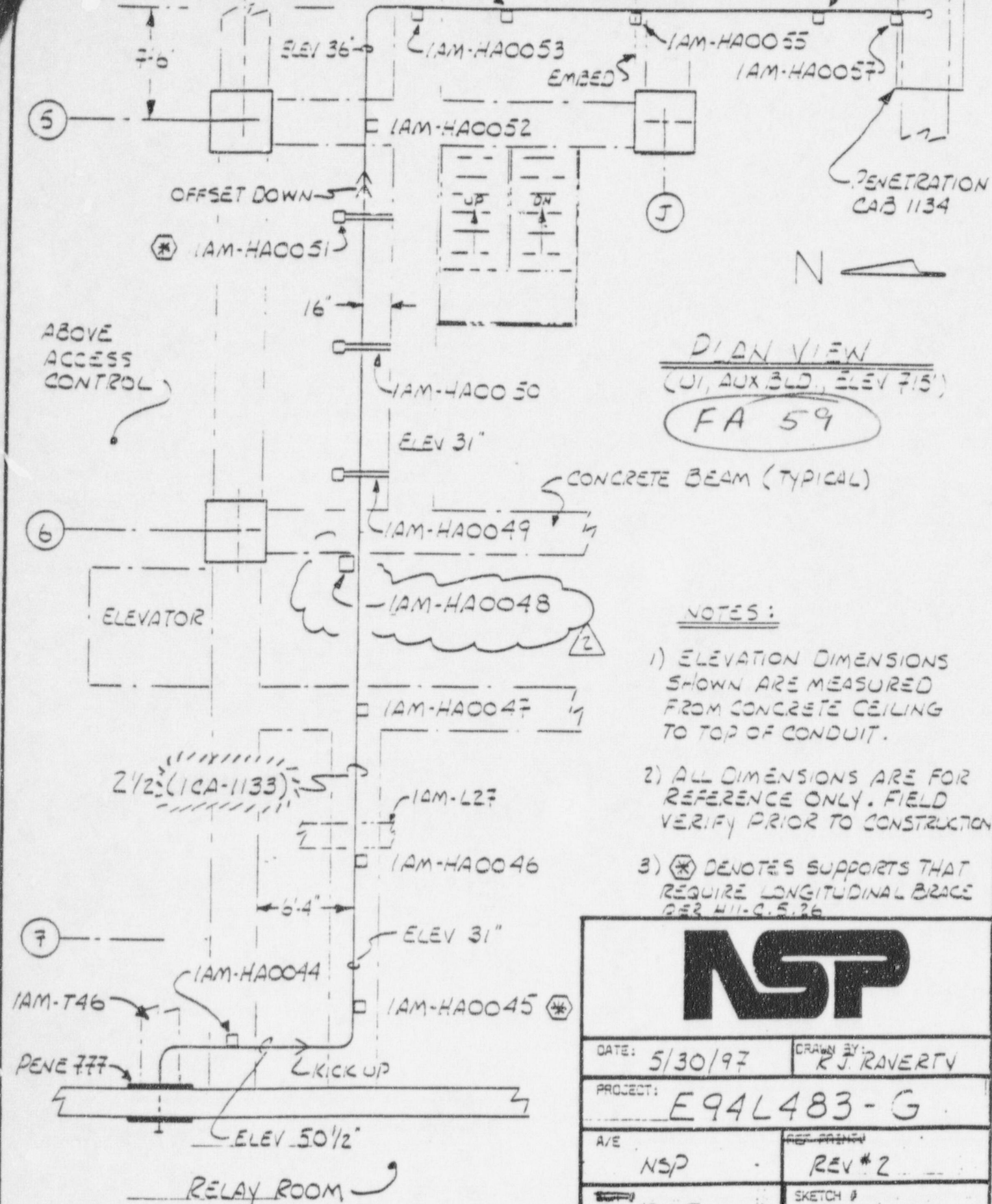
"All raceways included a support at the centre of the horizontal run comprising of a P1001 unistrut suspended from the furnace roof."

In Appendix A of the test report, in Figures 1a and 1b, the raceway construction and wrap details are shown. The tray support is a typical trapeze type tray support constructed from sections of P1001 unistrut channel material. To be noted here is that the wrap on the unistrut support only extends part way up the support. The support is wrapped only as a thermal short for approximately 12 inches from the interface with the tray. It should also be noted from these figures that the unistrut support is the sole means of support for the tray system within the furnace. In addition, photographs listed as Frame 4 and Frame 8 in Appendix E clearly show only partial wrapping of the support.

The fire test was conducted in two phases. The first phase was a test-to-failure of the 1-hour wrap system consisting of a 90 minute burn following the ASTM 119 curve. The test went the full 90 minutes and the test raceway was still intact at the completion of the test. This implies that the unprotected portion of the support did not fail. The second phase of the test (described in Addendum 1 of the test report) consisted of re-testing the existing tray system without cables installed and refitted with new wrap material. This test consisted of a 30 minute burn, following the ASTM 119 curve, followed by a 5 minute hose stream spray. The test fixture is then allowed to dry (with no changes to the construction) and then re-fired for 60 minutes, again following the ASTM 119 curve, followed by another 5 minute hose stream test. Following the second firing and second hose stream application the test configuration is still intact further implies that unprotected unistrut supports will remain functional during the testing requirements of GL 86-10, Supplement 1. We may, therefore, conclude that unprotected steel unistrut supports are adequate to support both cable tray and conduit loads during fires bounded by the ASTM 119 profile.

ATTACHMENT 2

Installation Detail Drawings Associated with
Each Installation of the Rockbestos Firezone R Cable



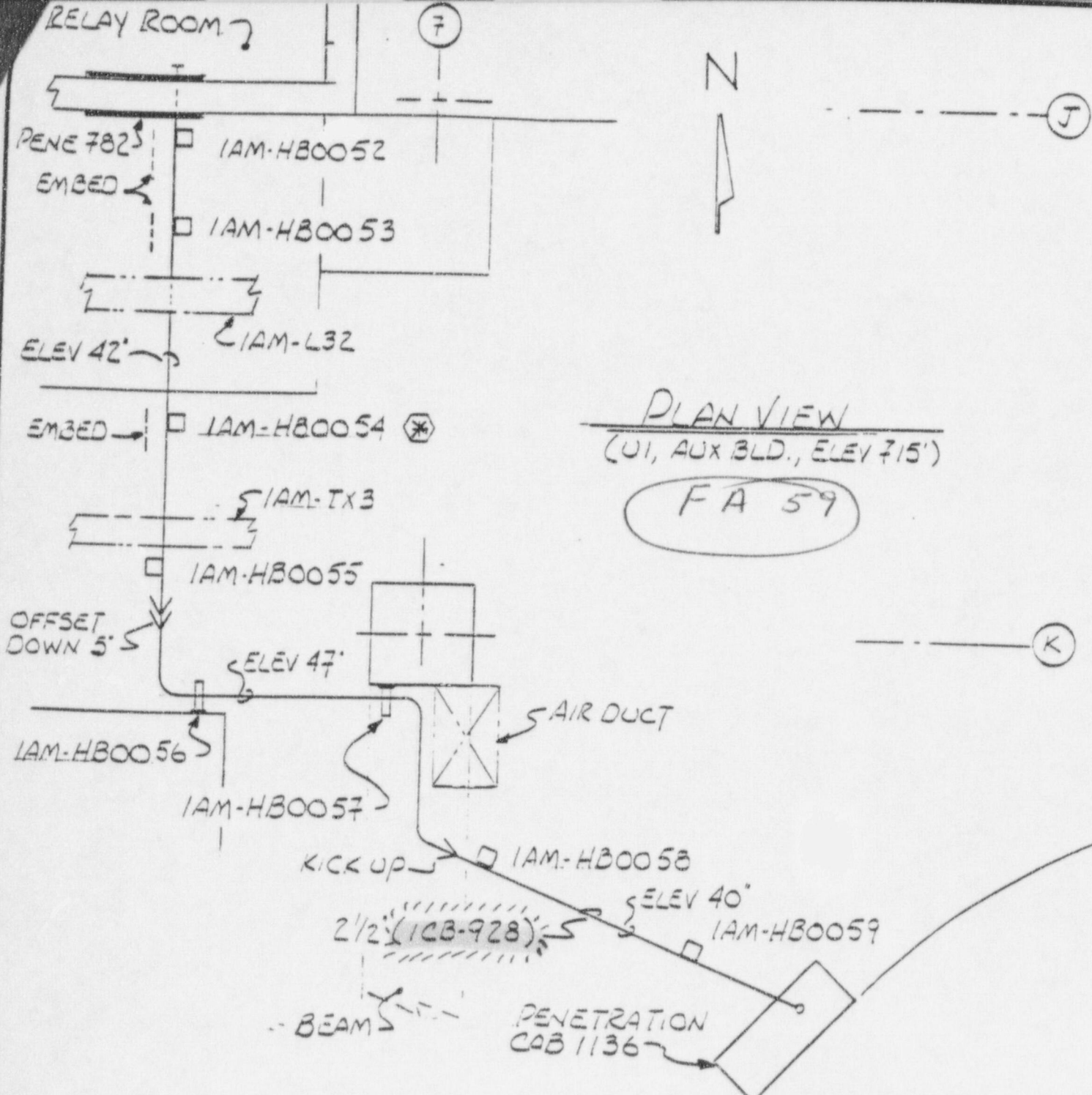
PLAN VIEW
 (UI, AUX BLD., ELEV 715')
FA 59

NOTES:

- 1) ELEVATION DIMENSIONS SHOWN ARE MEASURED FROM CONCRETE CEILING TO TOP OF CONDUIT.
- 2) ALL DIMENSIONS ARE FOR REFERENCE ONLY. FIELD VERIFY PRIOR TO CONSTRUCTION.
- 3) (*) DENOTES SUPPORTS THAT REQUIRE LONGITUDINAL BRACE PER H11-C.5.26



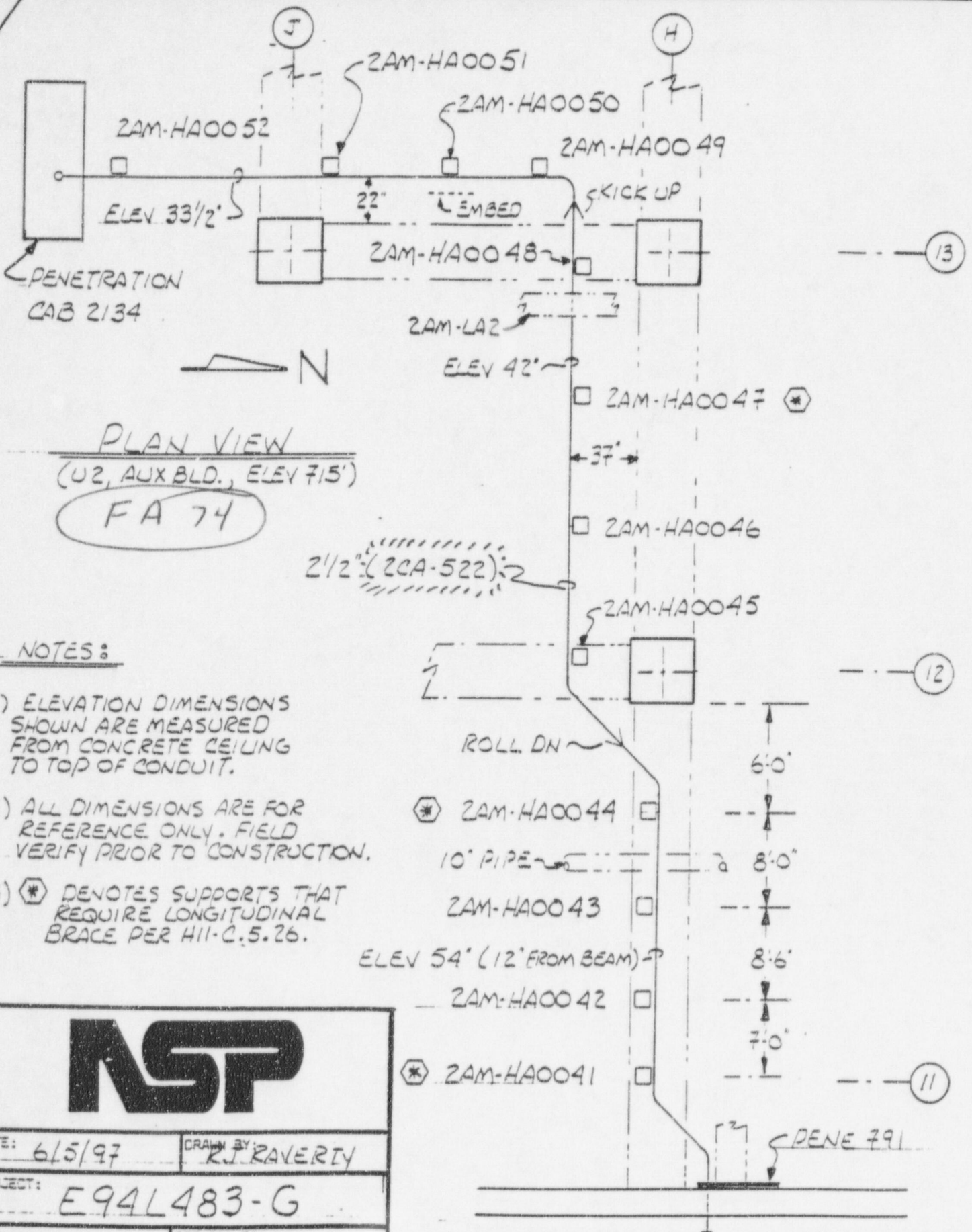
DATE: 5/30/97	DRAWN BY: R.J. RAVERTY
PROJECT: E94L483-G	
A/E: NSP	REV # 2
CONDUIT LAYOUT	SKETCH # 9704501-1



PLAN VIEW
 (UI, AUX BLD., ELEV 715')
 FA 59

- NOTES:
- 1) ELEVATION DIMENSIONS SHOWN ARE MEASURED FROM CONCRETE CEILING TO TOP OF CONDUIT.
 - 2) * DENOTES SUPPORT THAT REQUIRES LONGITUDINAL BRACE PER H11-C.5.26.

NSP	
DATE: 6/4/97	DRAWN BY: R.J. RAVERTY
PROJECT: E94L483-G	
- Attachment 2 Page 2 of 8 -	
CONDUIT LAYOUT	9704502-1



PLAN VIEW
(U2, AUX BLD., ELEV 715')

FA 74

NOTES:

- 1) ELEVATION DIMENSIONS SHOWN ARE MEASURED FROM CONCRETE CEILING TO TOP OF CONDUIT.
- 2) ALL DIMENSIONS ARE FOR REFERENCE ONLY. FIELD VERIFY PRIOR TO CONSTRUCTION.
- 3) * DENOTES SUPPORTS THAT REQUIRE LONGITUDINAL BRACE PER H11-C.5.26.

NSP	
DATE: 6/5/97	DRAWN BY: R.J. RAVERTY
PROJECT: E94L483-G	
A/E: NSP	REF PRINT#
CONDUIT LAYOUT	SKETCH # 9704503-1

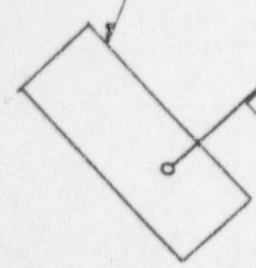
NOTES:

- 1) ELEVATION DIMENSIONS SHOWN ARE MEASURED FROM CONCRETE CEILING TO TOP OF CONDUIT.
- 2) ALL DIMENSIONS ARE FOR REFERENCE ONLY. FIELD VERIFY PRIOR TO CONSTRUCTION.
- 3) * DENOTES SUPPORTS THAT REQUIRE LONGITUDINAL BRACE PER H11-C.5.26.



PLAN VIEW
(U2, AUX BLD, ELEV 715')
FA 74

PENETRATION
CAB 2136



2AM-HB0119

2AM-HB0118

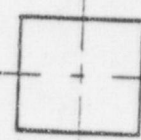
2 1/2" (2CB-472)

BEAM

2AM-HB0117

6'-0"

(K)



ABOVE COUNT RM.

BEAM

2AM-HB0116 *

ELEV 31'

2AM-HB0115

2AM-HB0114

EMBED

2AM-HB0113 *

ELEV 23'

ROLL DOWN

ELEV 47'

28'

4'-6"

(J)

RELAY ROOM

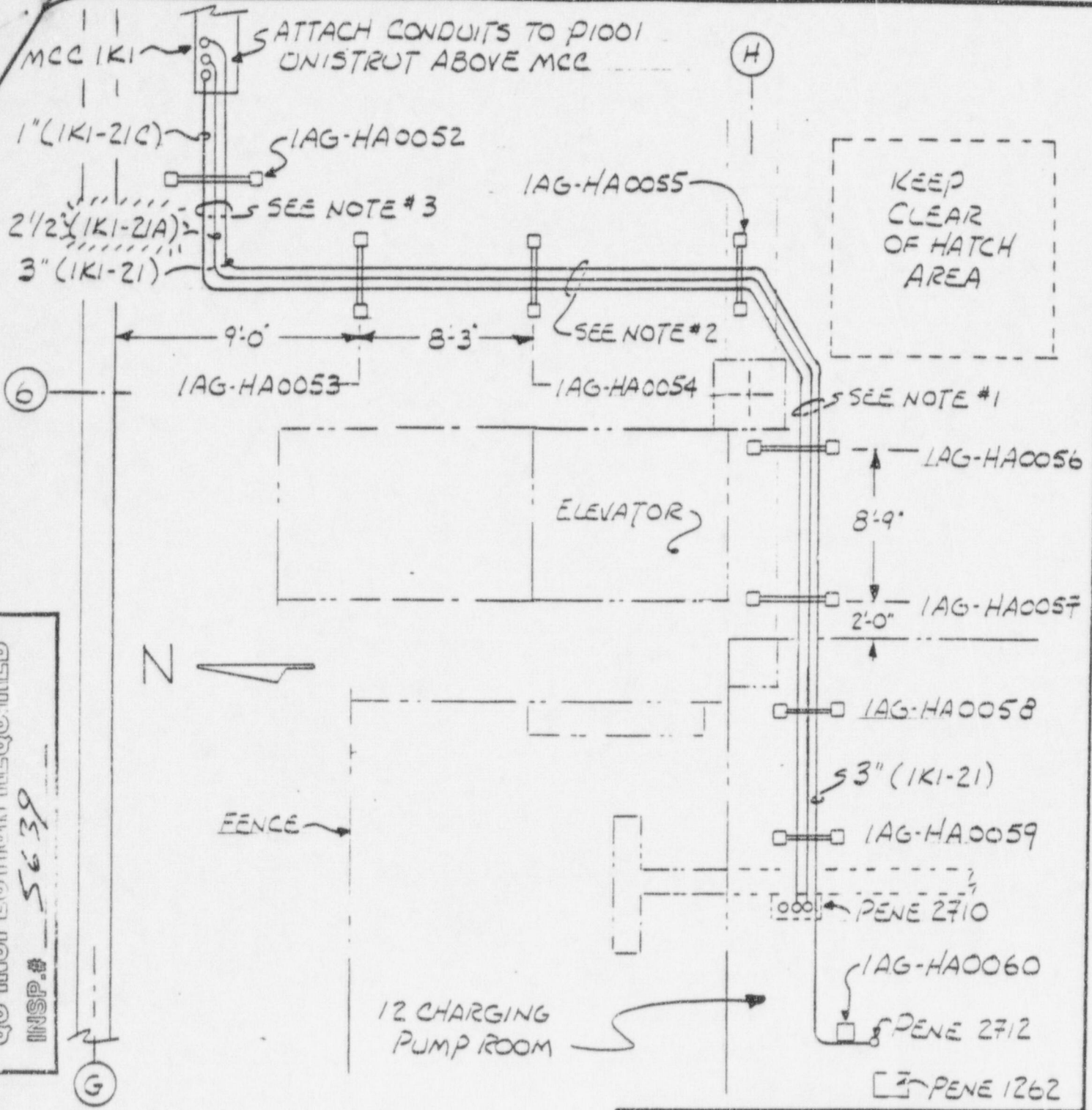
PENE 786

NSP	
DATE: 6/10/97	DRAWN BY: R. RAVERTY
PROJECT: F94L483-G	

Attachment 2 Page 4 of 8

CONDUIT LAYOUT	SKETCH # 9704504-1
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QC INSPECTION REQUIRED
 INSP.# 5639



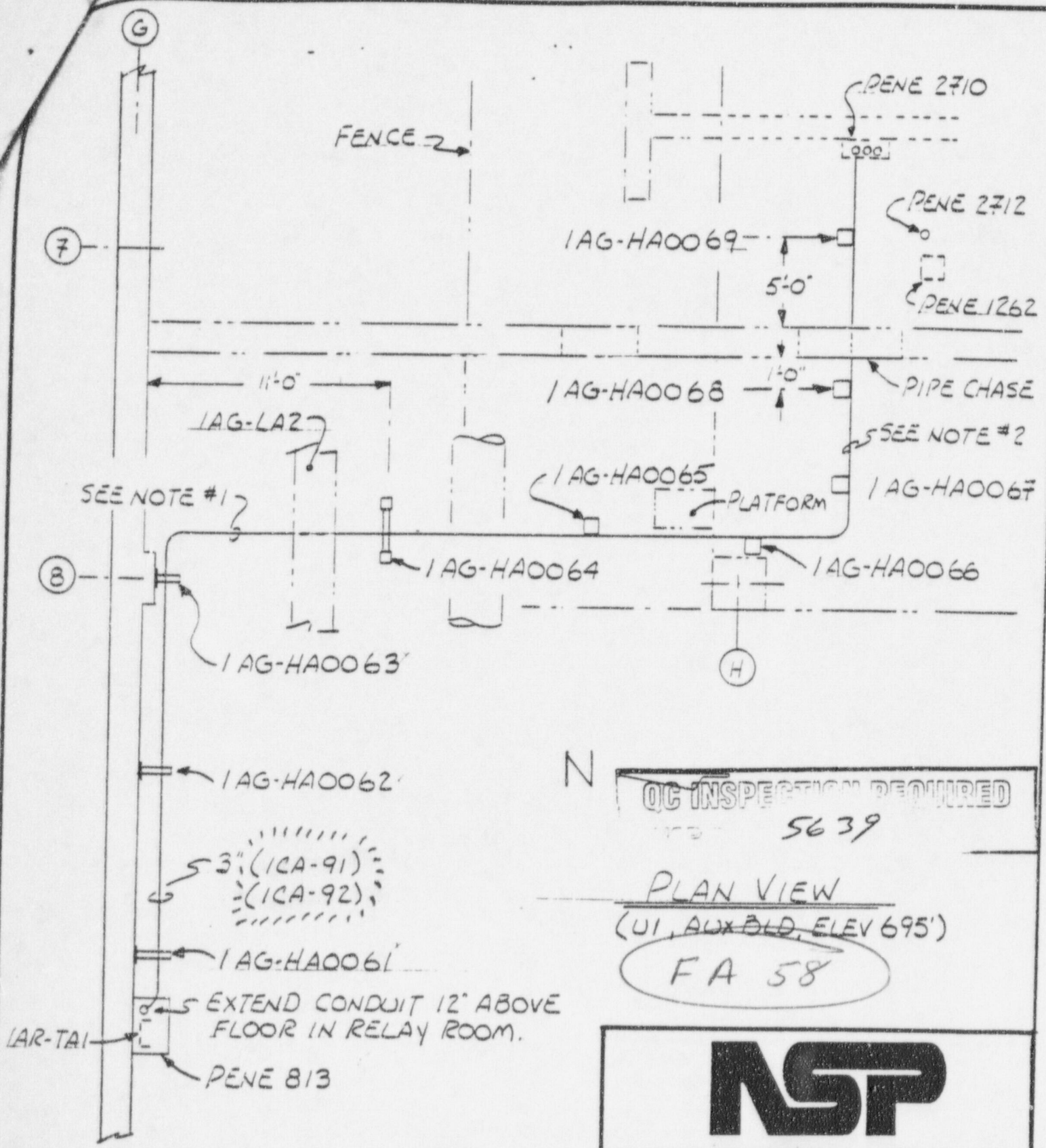
PLAN VIEW
 (UI, AUX BLD., ELEV. 695')
 FA 58

NOTES:

1. LOCATE BOTTOM OF CONDUITS AT 12'-1/2" FROM FLOOR AT THIS POINT.
2. LOCATE BOTTOM OF CONDUITS AT 12'-4 1/2" FROM FLOOR AT THIS POINT.
3. LOCATE BOTTOM OF CONDUITS AT 6'-0" FROM CEILING AT THIS POINT.

NSP

DATE: 5/15/97	DRAWN BY: R.J. RAVERTY
PROJECT: E941483-G	
Attachment 2 Page 5 of 8	
CONDUIT LAYOUT	SKETCH # 9703996-1



N

QC INSPECTION REQUIRED
 5639
 PLAN VIEW
 (UI, AUX BLD, ELEV 695')
 FA 58



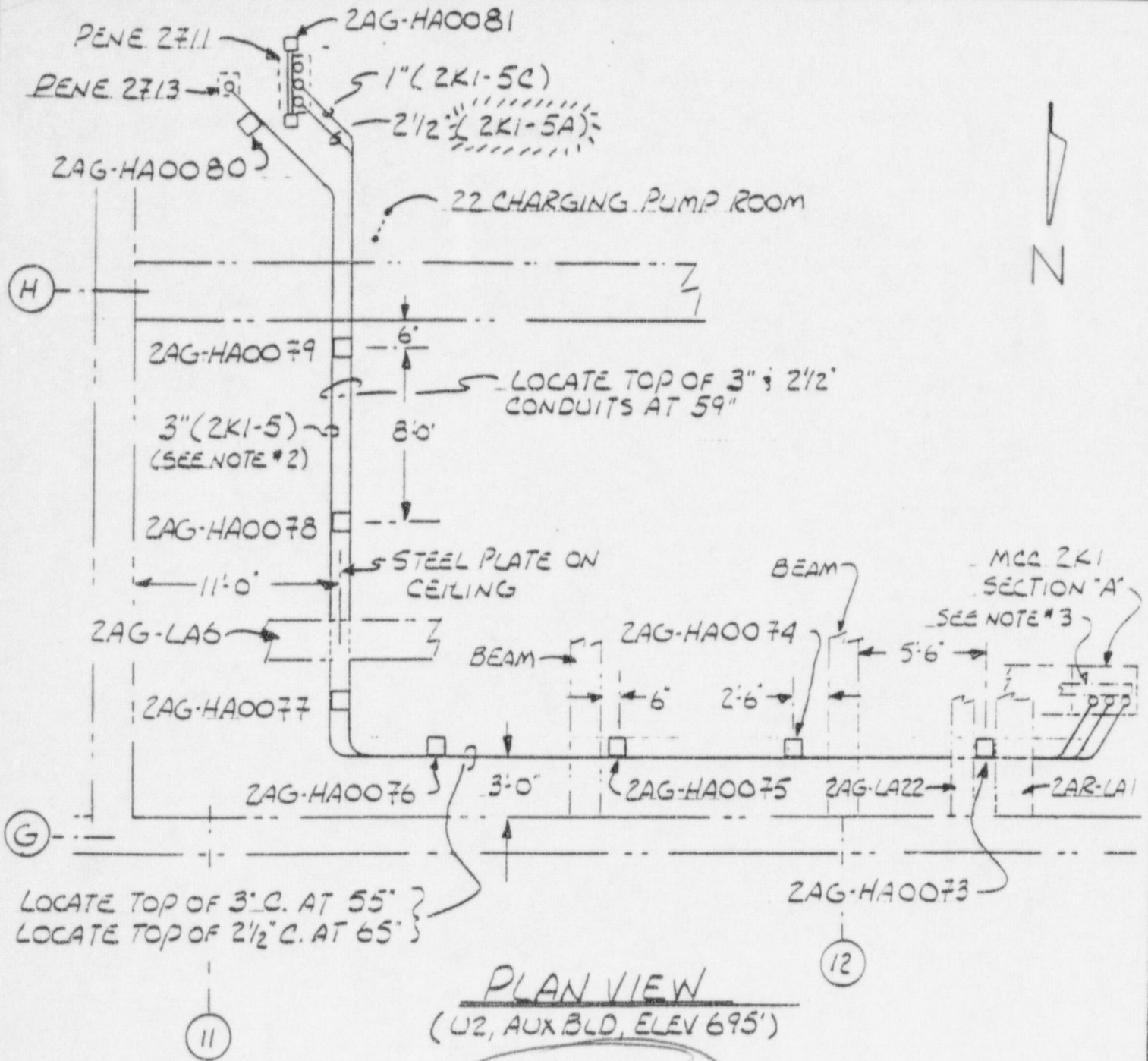
DATE: 4/30/97 DRAWN BY: R.J. RAVERTY
 PROJECT: F901483-G

Attachment 2 Page 6 of 8

ECR # CONDUIT LAYOUT SKETCH # 9703996-2

NOTES:

1. LOCATE TOP OF 3" CONDUIT AT 67" FROM CEILING AT THIS POINT.
2. LOCATE TOP OF 3" CONDUIT AT 17" FROM FLOOR ABOVE 13 CHARGING PMP



PLAN VIEW
(U2, AUX BLD, ELEV 695')
FA 73

NOTES:

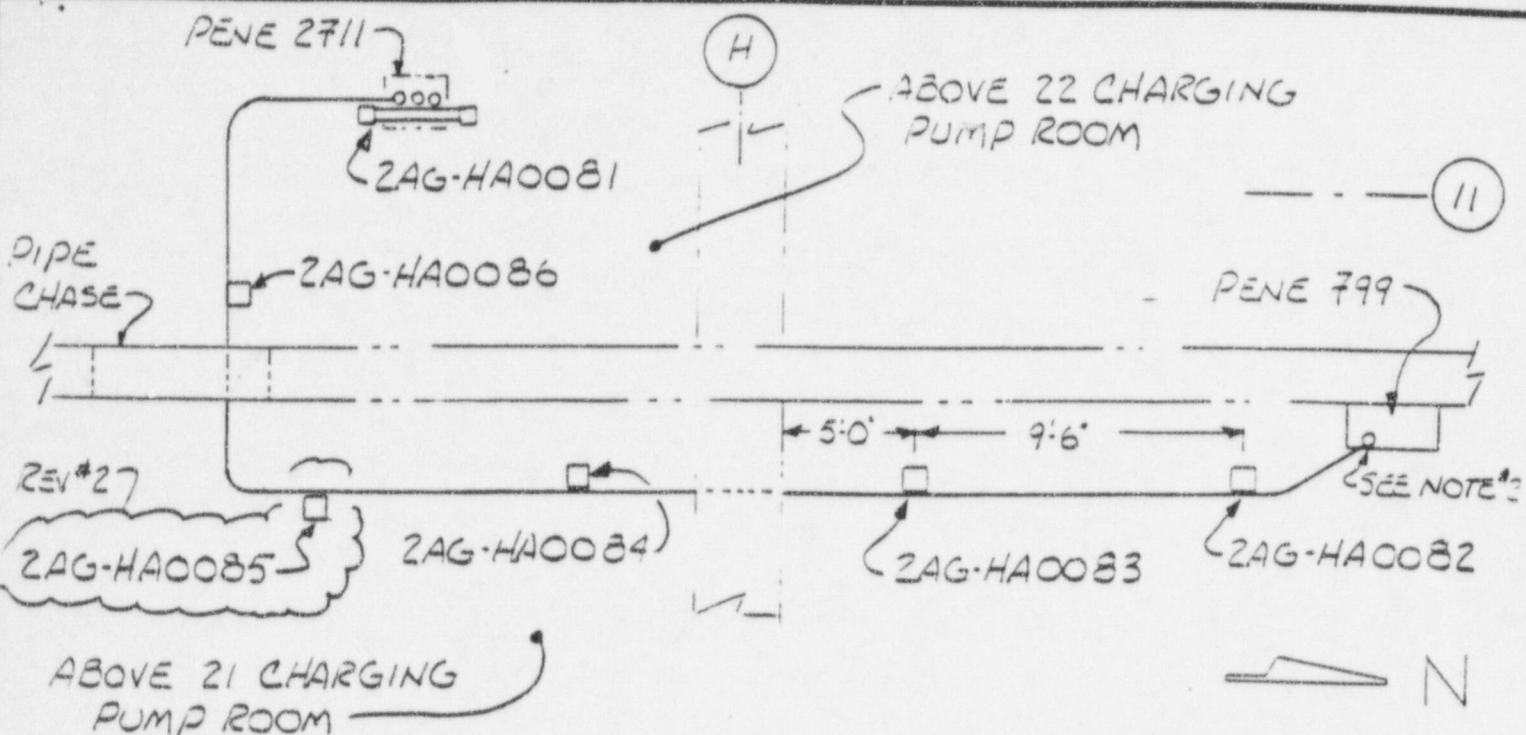
- 1) DIMENSIONS ARE FOR REFERENCE ONLY.
- 2) USE P2558-30, TWO HOLE STRAPS ON 3" POWER CONDUIT. THIS CONDUIT WILL BE WRAPPED WITH DARMAT.
- 3) ATTACH CONDUITS TO P1001 UNISTRUT ABOVE MCC.



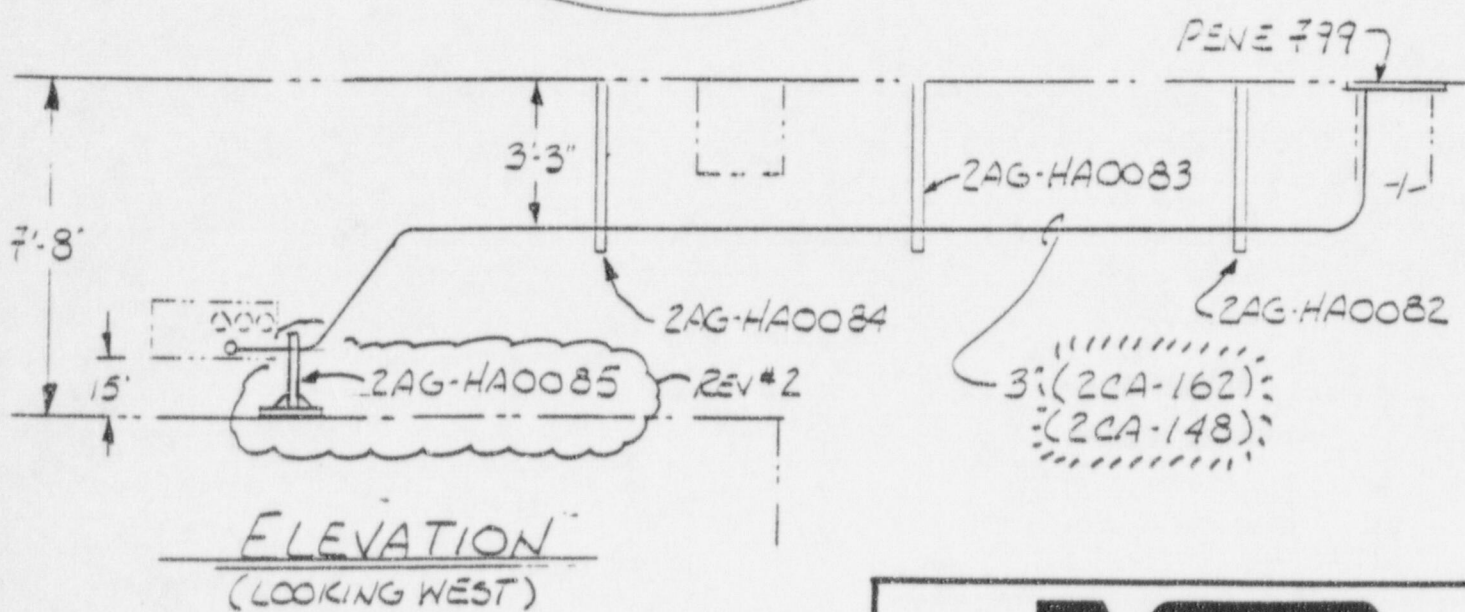
DATE: 5/12/97 DRAWN BY: R.J. ZAVERTY
PROJECT: F941483-G

- Attachment 2 Page 7 of 8 -

CONDUIT LAYOUT SKETCH # 9703998-1



PLAN VIEW
(U2, AUX BLD, ELEV 695')
FA 73



ELEVATION
(LOOKING WEST)

NOTE:

- 1) DIMENSIONS ARE FOR REFERANCE ONLY.
- 2) EXTEND CONDUIT 12" ABOVE FLOOR IN RELAY ROOM.

NSP	
DATE: 5/13/97	DRAWN BY: R.J. RAVERTY
PROJECT: EQ11193-C	
Attachment 2 Page 8 of 8	
CONDUIT LAYOUT	SKETCH # 9703998-2

ATTACHMENT 3

Rockbestos Firezone R Cable Routing Sketches

FIRE DETECTION ZONE 8
FIRE AREA 58 and Part of 73

FIRE DETECTION ZONE 8

F5 Appendix A

Rev. 5

Page 2 of 10

FIRE AREA(S): 58 and Part 73 LOCATION: Auxiliary Building Ground Floor, El. 695'

EMERGENCY LIGHTING: Yes - plus 8 hr.

TYPE OF FIRE: Cable - Oil

PERSONNEL HAZARDS: Surface Contamination
Possible High Airborne Activity
Spills 900 gas - gases treated prior to release

COMMUNICATIONS: Dial telephone
Gai-traonics page
Sound powered, phone jackbox

FIRE EQUIPMENT: Stairway Wet Pipe System - (SWP 2 & 4)
Detectors 8-43 & 44 located in ceiling of Changing Pump Vaults
Hose Stations
CO extinguisher
Wet Pipe in Elevator Machine Room (WPS-11)
Cooling water x-over for Diesel Room PAD-1, Valve CW 15-4 Auxiliary
Building Sprinkler System Valve CW 15-3. Cooling water x-over to Auxiliary Building,
Unit 1, CQ 17-13 & 14 and Unit 2 2CL 17-13 & 14 for Sprinkler System

EQUIPMENT CONTROL:

- #11 - S.I. Pump Bus 15 Bkr 1
- #12 - S.I. Pump Bus 16 Bkr 7
- #11 - RHR Pump Bus 15 Bkr 4
- #12 - RHR Pump Bus 16 Bkr 6
- #11 - C.S. Pump Bus 15 Bkr 9
- #12 - C.S. Pump Bus 16 Bkr 1
- #11 - C.C. Pump Bus 15 Bkr 5
- #12 - C.C. Pump Bus 16 Bkr 5
- #21 - C.C. Pump Bus 25 Bkr 13
- #22 - C.C. Pump Bus 26 Bkr 5
- #11 - CHG Pump MCC 1K2 Cell B-4
- #12 - CHG Pump MCC 1K1 Cell A-4
- #13 - CHG Pump MCC 1K2 Cell A-3

MCC 1K1 Bus 111 Bkr 111J MCC 1K2 Bus 121 Bkr 121J
MCC 1KA2 Bus 121 Bkr 121B

Safeguard

- #11 - S.I. Pump Bus 15 Bkr 1
- #11 - Charging Pumps MCC 1K-2 Cell B-4
- #13 - Charging Pumps MCC 1K-2 Cell C-4

SECURE NORMAL VENTILATION

- Bus 190, Bkr 193 - De-energizes MCC-1N1 and 1NA1
- Bus 290, Bkr 293 - De-energizes MCC-1N2 and 1NA2
- Bus 230, Bkr 232 - De-energizes MCC-2N1
- Bus 240, Bkr 242 - De-energizes MCC-2N2 and 2V2

FIRE DETECTION ZONE 8

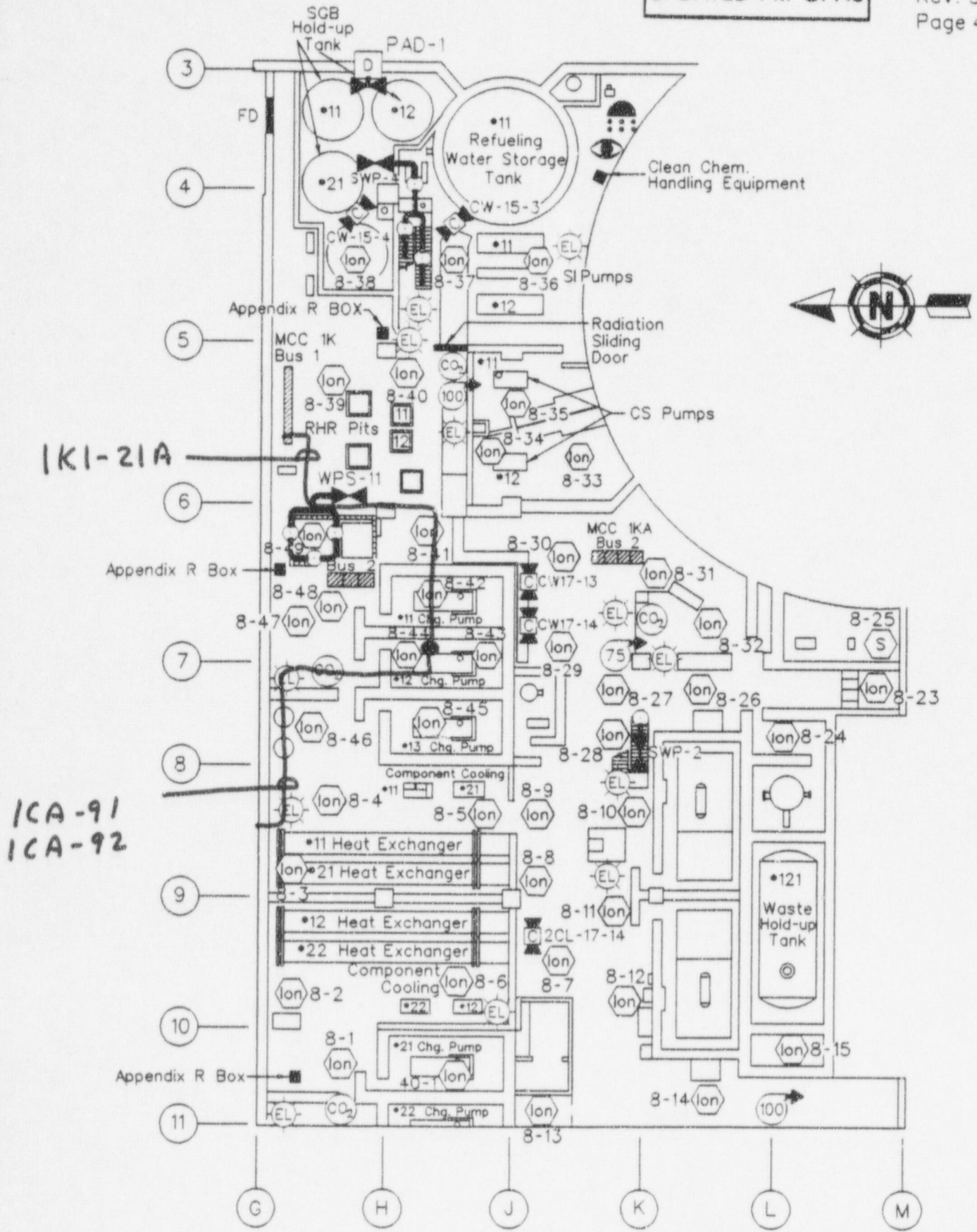
SPECIAL
INSTRUCTIONS:

Smoke Removal via Auxiliary Building special ventilation.
Refer to MCC & Cell book in Control Room for loss of MCCs.
Self-contained breathing apparatus required until air sample is taken and analyzed.
For sprinkler isolation, see Det Zone 9.
"SCBAs" may be required if high airborne activity is present.
Refer to MCC & cell listing for loss of MCCs.
Fire can be controlled by use of hose stations & fire extinguishers.

SUMMARY:

Fire in area would be of light intensity. Care should be exercised due to possible airborne activity; use of "SCBAs" advised until air samples are taken and analyzed. Flammable liquid lockers with various flammables located on this level.

H₂N₂ supply is regulated by security shut-off valves which are activated by self-contained regulators. They close upon high DP and can only be operated manually.



Auxiliary B Attachment 3 page 4 of 14
Gnd Flr El. 695'

FIRE DETECTION ZONE 40

FIRE AREA 73

FIRE DETECTION ZONE 40

FIRE AREA(S): 73 LOCATION: Unit 2 Auxiliary Building, El. 695'

EMERGENCY LIGHTING: Yes - plus 8 hr.

TYPE OF FIRE: Cable - Oil

PERSONNEL HAZARDS: Surface contamination
Possible high airborne may be present
All spills less than 900 gas and gases treated prior to release
Caustic pump West end

COMMUNICATIONS: Dial telephone
Sound powered phone jackbox

FIRE EQUIPMENT: Stairway Wet Pipe System (SWP-12)
Hose Stations
CO₂ fire extinguishers
Cooling water x-over for Auxiliary Building sprinkler system
Valve #2CL-17-13

EQUIPMENT CONTROL:

MCC 2K-1:	Bus 211 Bkr 211J
MCC 2K-2:	Bus 221 Bkr 221J
MCC 2KA-2:	Bus 221 Bkr 221B
#22 Charging Pump	MCC 2K1 Cell A-4
#22 Safety Injection Pump	Bus 25 Bkr 8
#21 RHR Pump	Bus 26 Bkr 11
#22 RHR Pump	Bus 25 Bkr 7
#21 Containment Spray Pump	Bus 25 Bkr 9
#22 Containment Spray Pump	Bus 26 Bkr 9

SECURE NORMAL VENTILATION

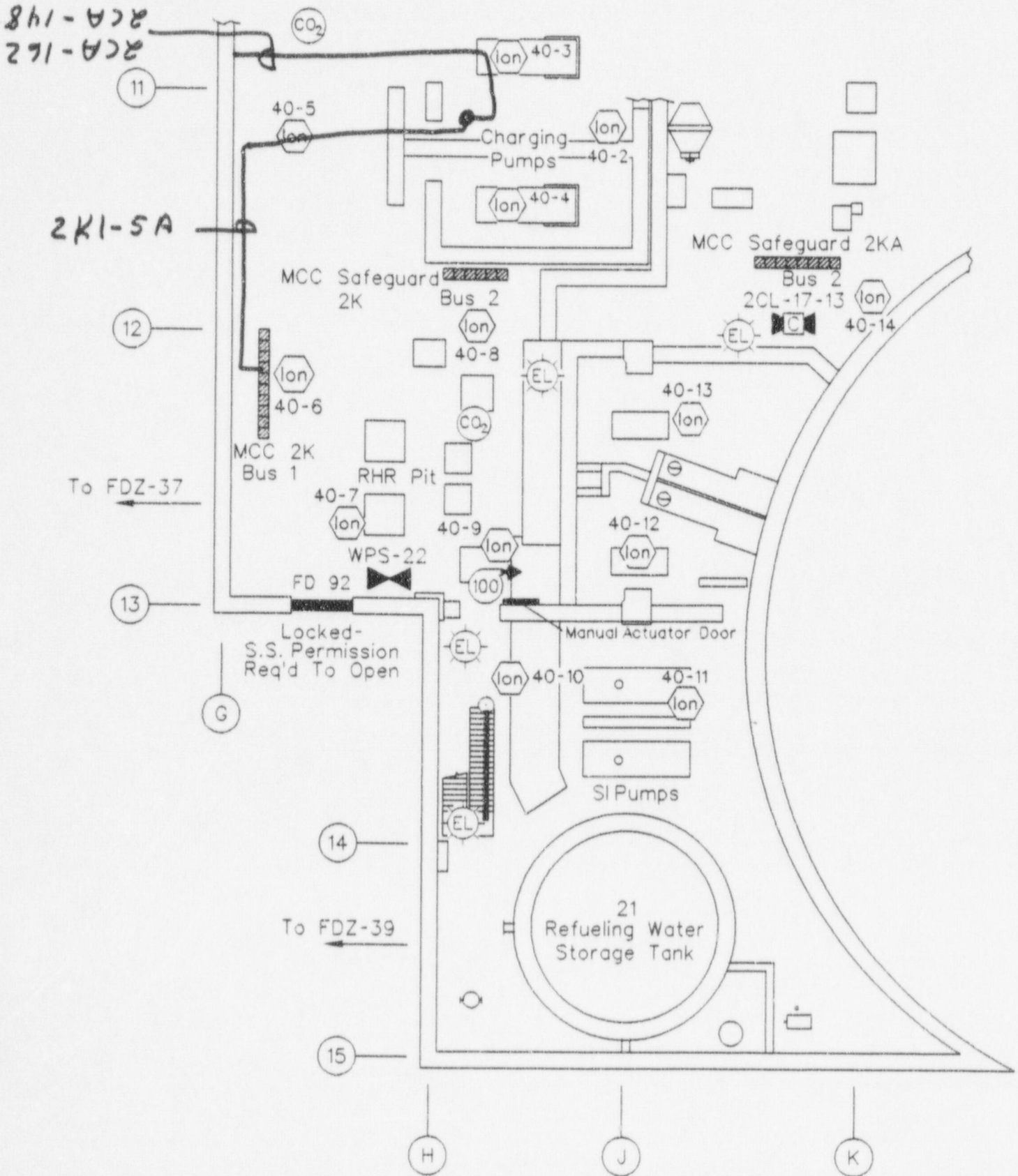
Bus 190, Bkr 193 - De-energizes MCC-1N1
Bus 290, Bkr 293 - De-energizes MCC-1N2
Bus 230, Bkr 232 - De-energizes MCC-2N1
Bus 240, Bkr 242 - De-energizes MCC-2N2

SPECIAL INSTRUCTIONS: Smoke Removal via Auxiliary Building special ventilation.
Frisk before leaving contaminated areas.
"SCBAs" may be required if activity is present.
May need chemical neutralizing kit if oil spill has occurred.

SUMMARY: Care must be exercised in event of a fire in this area since contamination and high airborne activity may be present. Fire can be controlled by use of hose station and fire extinguishers. Several flammable liquid lockers located in area.



841-428
271-428



Unit 2 Aux Bld
Flr El. 695'

A Hachment 3 Page 7 of 14

FIRE DETECTION ZONE 19
FIRE AREAS 59 & 84

FIRE DETECTION ZONE 19

FIRE AREA(S): 59 & 84 LOCATION: Unit One Auxiliary Building/Hot Lab - Count Room, El. 715'

EMERGENCY LIGHTING: Yes - plus 8 hr

TYPE OF FIRE: Area 59 Cable Area 84 Cable

PERSONNEL HAZARDS: Contaminated areas. Possible high airborne activity.
Spills less than 900 gal & gases treated prior to release.

COMMUNICATIONS: Sound powered phone jackboxes
Dial telephone
Portable radio use may be limited or restricted in several areas of this fire zone. These areas are marked in the plant.

FIRE EQUIPMENT: Hose stations
CO₂ fire extinguishers
Wet Pipe Sprinkler System (WPS-19)
Pre-Action Deluge (PAD - 3 & 4) for cable penetration to containment

EQUIPMENT CONTROL: Power & Control Cables

Safe Guards:
MCC 1L2 Bus 122 Bkr 122E
MCC 1L1 Bus 112 Bkr 112E
MCC 1X1 Bus 112 Bkr 112J
MCC 1X2 Bus 122 Bkr 122J
Boric Acid Transfer Pump #11: CC 1L1 Cell B-5
#12: MCC 1L2 Cell C-5
#21: MCC 2L1 Cell E-5
#22: MCC 2L2 Cell A-5

Normal MCC 1H1-Bus 190-Bkr 192
Normal MCC 1H2-Bus 290-Bkr 292
Normal MCC 1J1-Bus 310-Bkr 312
Normal MCC 1J2-Bus 320-Bkr 325

SECURE NORMAL VENTILATION
Bus 190, Bkr 193 - de-energizes MCC-1N1
Bus 290, Bkr 293 - de-energizes MCC-1N2
Bus 230, Bkr 232 - de-energizes MCC-2N1
Bus 240, Bkr 243 - de-energizes MCC-2N2
Detectors #19-1 through 6 are over Access Control, Detectors #19-22, 19-27 through 19-31 are over Hot Chem. Lab. & Volume Control Room Tank

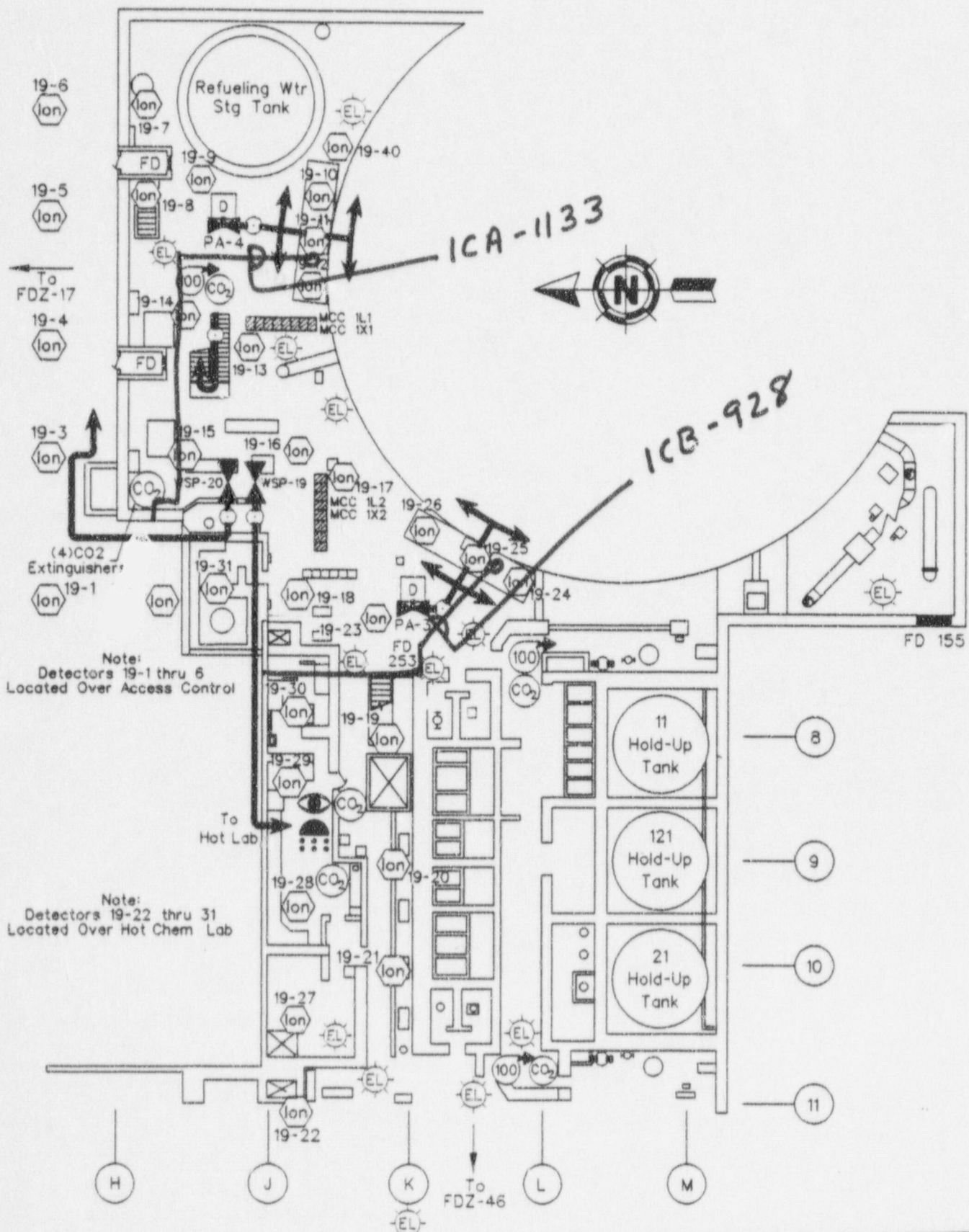
FIRE DETECTION ZONE 19

SPECIAL
INSTRUCTIONS:

Smoke Removal via Auxiliary Building special ventilation
"SCBAs" may be required if high airborne activity is present.
Refer to MCC and cell listing for loss of MCCs
Entrance to spent fuel Hx and waste gas compressor area via Fuel Handling Area,
El. 715'

SUMMARY:

Fire in Zone 29 could present potential high airborne activity. Care must be exercised in controlling fire in this area to prevent overexposure to personnel.



Note:
Detectors 19-1 thru 6
Located Over Access Control

Note:
Detectors 19-22 thru 31
Located Over Hot Chem Lab

Unit 1 Aux Bldg & Hc - Attachment 3 page 11 of 19
Fir El. 715

FIRE DETECTION ZONE 46

FIRE AREA 74

A Attachment 3 Page 12 of 14

ATTACHMENT 4

Letter from Rockbestos dated October 27, 1998



Corporate Headquarters
20 Bradley Park Road
P.O. Box 1102
East Granby, CT 06026-1102 USA
Tel: 860-653-8300
Fax: 860-653-8301

October 27, 1998

Northern States Power
Tom Lillehei, PEE
Nuclear Generation Services
1717 Wakonade Drive East
Welch, MN 55089

Re: Your Letter Dated September 15, 1998

Dear Mr. Lillehei:

We have the following comments to the questions posed in the subject NSP letter:

1. "The Underwriters Laboratories (UL) test report on Rockbestos Firezone R cable did not state the test standard to which it was conducted, the acceptance criteria, for the tested cables, or include a detailed test plan or test protocol. Please provide these elements."

Response:

The test "standard" was the fire exposure to which cables for redundant safety trains must withstand as outlined in "Fire Protection Program For Operating Nuclear Power Plants" (Appendix R to 10 CFR 50). Since this test was undertaken as an investigation, the test plan is contained in the Abstract on page i, and in more detail under the heading "General" on pages 1, 2, and 3. There was no stated "test criteria"; the test was conducted to provide information on whether this class of fire resistant cables would be suitable for redundant safety trains exposed to the postulated time-temperature envelope outlined in appendix R to 10CFR 50. This investigation was undertaken with the knowledge and advice of both an operating Nuclear Utility (GPU) and the NRC. Neither of these entities requested a formal test plan be written prior to the actual test, and none, with the exception of the test description listed above was provided separately. It is safe to state that considerable planning and thought went into this process and is documented in the report itself. No other test "plan" was or will be written.

2. "The UL test further states that leakage current measurement were taken during the full scale fire test of the Rockbestos cable. The numerical results of the leakage current measurements were not recorded in the report. Provide the numerical values for leakage current in the Firezone R cables that were monitored during the test"



A member of The Marmun Group of companies

— Attachment 4 Page 1 of 2 —

Page 2

Response:

Leakage currents were not monitored during the full scale fire test of the Rockbestos cables and nowhere in the report is the claim made that they were monitored. It was in fact because the test circuit configuration precluded such measurements that the small scale test was conducted. In this portion of the test, the cables were energized with the stated voltages, and leakage currents were monitored at intervals during and after the fire exposure. The observed leakage currents appear on page 28 and 29 of the report.

3. "The UL fire test tested specific sizes of instrument and power Firezone R cables. Demonstrate how the sizes of Firezone R cables, which you propose to install, are bounded by the list"

Response:

Because of the nature of the test, it is concluded that any cable using the same conductor materials, insulation materials, and method of manufacture would also perform in a similar manner as long as its construction included conductors of the same size or larger and/or insulation thickness as thick or thicker than that used in the test. This follows from the fact that two sizes were used in the test (#14 AWG and #6 AWG). Using this logic, cables up to and including #4/0 have been approved by the NRC in specific installations.

Sincerely,



James M. Morganelli
Applications Engineer

JMM/ja

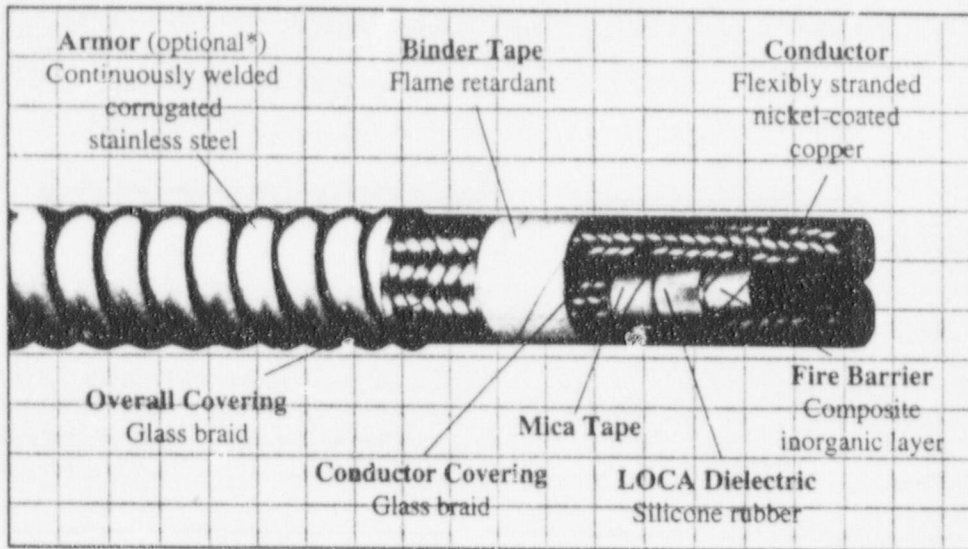
cc: T. S. Bhat
Eric Cohen
Doug Soulierre

RGLTR WPD

— Attachment 4 Page 2 of 2 —

ATTACHMENT 5

Manufacturers Catalog Specification Sheet



Firezone R
Appendix "R"
Fireproof Cable
 (Inorganic Layers)

90°C*, 600 Volt
 Class 1E Nuclear

Spec. RSS-3-144

Scope

Firezone®R is a fireproof cable specifically designed to address redundant safety circuit requirements within nuclear generating stations. This unique Class 1E nuclear qualified cable system insures safety-related circuit integrity in the event of a fire as required

by Appendix "R". (Code of Federal Regulations: Title 10, Part 50.48). It is intended for use on low voltage control, power and instrumentation circuits and can be supplied in either armored or unarmored* versions.

Features

- Cost-efficient alternative to thermal wrapping of cable trays or cable re-routing
- Can be installed within trays containing typical plant cables
- Other cables within tray do not have to be derated (as is necessary with ampacities for cables inside thermally wrapped trays)
- Additional circuits can be easily added
- Does not require costly inspection, maintenance and record keeping associated with tray wrapping
- Full traceability provided
- Radiation resistant
- Flame retardant
- Nuclear qualified with a minimum 40-year thermal life expectancy at 90°C**

Performance Standards

- Minimum one hour fire rating at 1700°F as defined by the ASTM standard E-119
- Greater than three hour fire survival at 1500°F
- Class 1E qualified in accordance with IEEE-383 and IEEE-323. (Rockbestos Report QR-9801)
- Full ASTM E-119 fire test report available under UL report file #R10925-1, project #84NK2320 (Note: this is not a UL listed cable)
- Cable passed the IEEE-383 70,000 BTU/hr vertical tray flame test
- Silicone rubber insulation layer is in accordance with ICEA standard S-19-81
- Quality Assurance program in accordance with 10 CFR Appendix B

Construction

- Conductor:**
Flexible strand, high temperature, nickel-coated copper conductor
- Fire Barrier:**
Composite inorganic layer
- LOCA Dielectric:**
Silicone rubber insulation layer
- Conductor Covering:**
Mica tape and glass braid with high temperature finish
- Circuit Identification:**
White braids with colored tracers
- Cabling:**
Required number of conductors cabled
- Binder Tape:**
Flame retardant binder tape
- Armor: (optional**)**
Continuously welded, corrugated, stainless steel sheath

— Attachment 5 Page 1 of 2 —

* Silicone rubber insulation has an inherent 125°C 40-year thermal life

** Unarmored cable must be installed in steel conduit.

Firezone®R

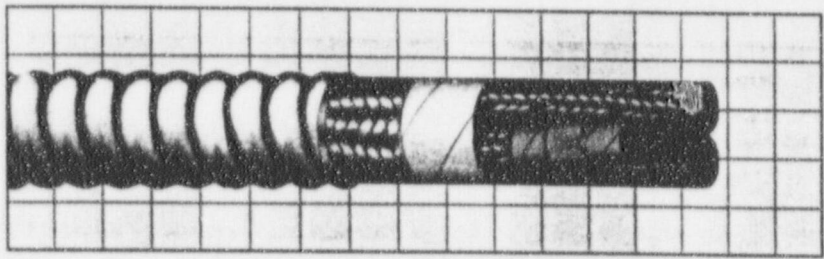
Appendix "R"

Fireproof Cable

(Inorganic Layers)

90°C*, 600 Volt
Class 1E Nuclear

Spec. RSS-5-144



Stainless Steel Armored

Product Code	Number of Conductors	Conductor Size	Number of Strands	Single Conductor Diameter (In)	Nominal Overall Diameter (In)	Approximate Net Weight (Lbs/M')
F54-3017	2	14 AWG	19	.27	.78	260
F54-3041	3	14 AWG	19	.27	.92	320
F54-3045	4	14 AWG	19	.27	.96	390
F54-3053	7	14 AWG	19	.27	1.00	540
F54-3004	2	12 AWG	19	.29	.84	290
F54-3042	3	12 AWG	19	.29	.96	370
F54-3046	4	12 AWG	19	.29	1.00	450
F54-3054	7	12 AWG	19	.29	1.13	650
F54-3040	2	10 AWG	49	.33	.96	360
F54-3005	3	10 AWG	49	.33	1.00	430
F54-3047	4	10 AWG	49	.33	1.00	530
F54-3055	7	10 AWG	49	.33	1.33	820
F54-3043	3	8 AWG	133	.39	1.26	600
F54-3048	4	8 AWG	133	.39	1.26	740
F54-3044	3	6 AWG	133	.44	1.26	730
F54-3049	4	6 AWG	133	.44	1.46	930
F54-3014	3	4 AWG	133	.54	1.50	1150
F54-3050	4	4 AWG	133	.54	1.56	1220
F54-3016	3	2 AWG	665	.60	1.61	1470
F54-3051	4	2 AWG	665	.60	1.71	1650
F54-3057	3	1 AWG	817	.67	1.80	1630
F54-3052	4	1 AWG	817	.67	2.02	2100

Unarmored (Must be installed in conduit)

F54-3019	2	14 AWG	19	.27	.62	150
F54-3025	3	14 AWG	19	.27	.66	200
F54-3030	4	14 AWG	19	.27	.73	250
F54-3021	7	14 AWG	19	.27	.88	400
F54-3010	2	12 AWG	19	.29	.66	170
F54-3020	3	12 AWG	19	.29	.70	240
F54-3031	4	12 AWG	19	.29	.78	300
F54-3009	7	12 AWG	19	.29	.94	480
F54-3024	2	10 AWG	49	.33	.73	220
F54-3011	3	10 AWG	49	.33	.78	290
F54-3032	4	10 AWG	49	.33	.87	380
F54-3038	7	10 AWG	49	.33	1.05	620
F54-3026	3	8 AWG	133	.39	.93	430
F54-3033	4	8 AWG	133	.39	1.03	560
F54-3027	3	6 AWG	133	.44	1.02	550
F54-3034	4	6 AWG	133	.44	1.14	720
F54-3028	3	4 AWG	133	.54	1.15	760
F54-3055	4	4 AWG	133	.54	1.29	990
F54-3029	3	2 AWG	665	.60	1.29	1070
F54-3036	4	2 AWG	665			
F54-3058	3	1 AWG	817			
F54-3037	4	1 AWG	817			

— Attachment 5 Page 2 of 2 —

* Silicone rubber insulation has an inherent 125°C 40-year thermal life