


October 24, 1995

LICENSEE: Florida Power Corporation
FACILITY: Crystal River Unit 3 (CR-3)
SUBJECT: SUMMARY OF MEETING ON OCTOBER 19, 1995, REGARDING THERMO-LAG RESOLUTION STRATEGY

Licensee representatives met with members of the staff on October 19, 1995, in Rockville, Maryland, to discuss their strategy for resolution of the Thermo-Lag fire barrier issue. Enclosure 1 is a list of attendees.

The licensee presented an overview of its Thermo-lag resolution strategy and indicated that it plans to submit an integrated approach for this strategy by the end of this year. The licensee discussed its proposed testing of alternate fire barrier, results of its application of Nuclear Energy Institute (NEI) guide and its proposed Appendix R exemption request. Enclosure 2 consists of the licensee's handout.


L. Raghavan, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures: As stated

cc w/enclosures: See next page

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OFFICE	LA:PDII-1 <i>eto</i>	PM:PDII-1	D:PDII-1		
NAME	EDunnington	LRaghavan <i>l</i>	DMatthews		
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MEMORANDUM DATED October 24, 1995

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ACRS (4)

GTracy, EDO RII

KLandis, RII*

310004

DFD

Florida Power Corporation

Crystal River Unit No. 3
Generating Plant

cc:

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B&W Nuclear Technologies
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Crystal River, Florida 34428-6708

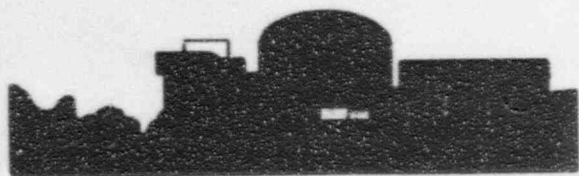
Mr. Percy M. Beard, Jr.
Senior Vice President,
Nuclear Operations
Florida Power Corporation (SA2A)
ATTN: Manager, Nuclear Licensing
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

FPC/NRC Meeting

October 19, 1995

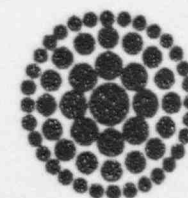
List of Attendees

<u>Name</u>	<u>Office</u>
L. Raghavan	NRC/NRR
A. Pal	NRC/NRR
Bob Beller	IBEX Engineering Services
Greg Schmalz	Transco Inc
Bert Spear	Florida Power
Sid Powell	Florida Power
Larry Dymek	Florida Power
Bill Rossfeld	Florida Power
Nick Fioravante	Florida Power
Ed Connell	NRC/NRR
Steven West	NRC/NRR
Conrad McCracken	NRC/NRR
Mike Casada	Florida Power
Mark Jacobs	Florida Power
Tim Stack	BWNT
Ken Price	BWNT
Roger Maggi Sr	BWNT



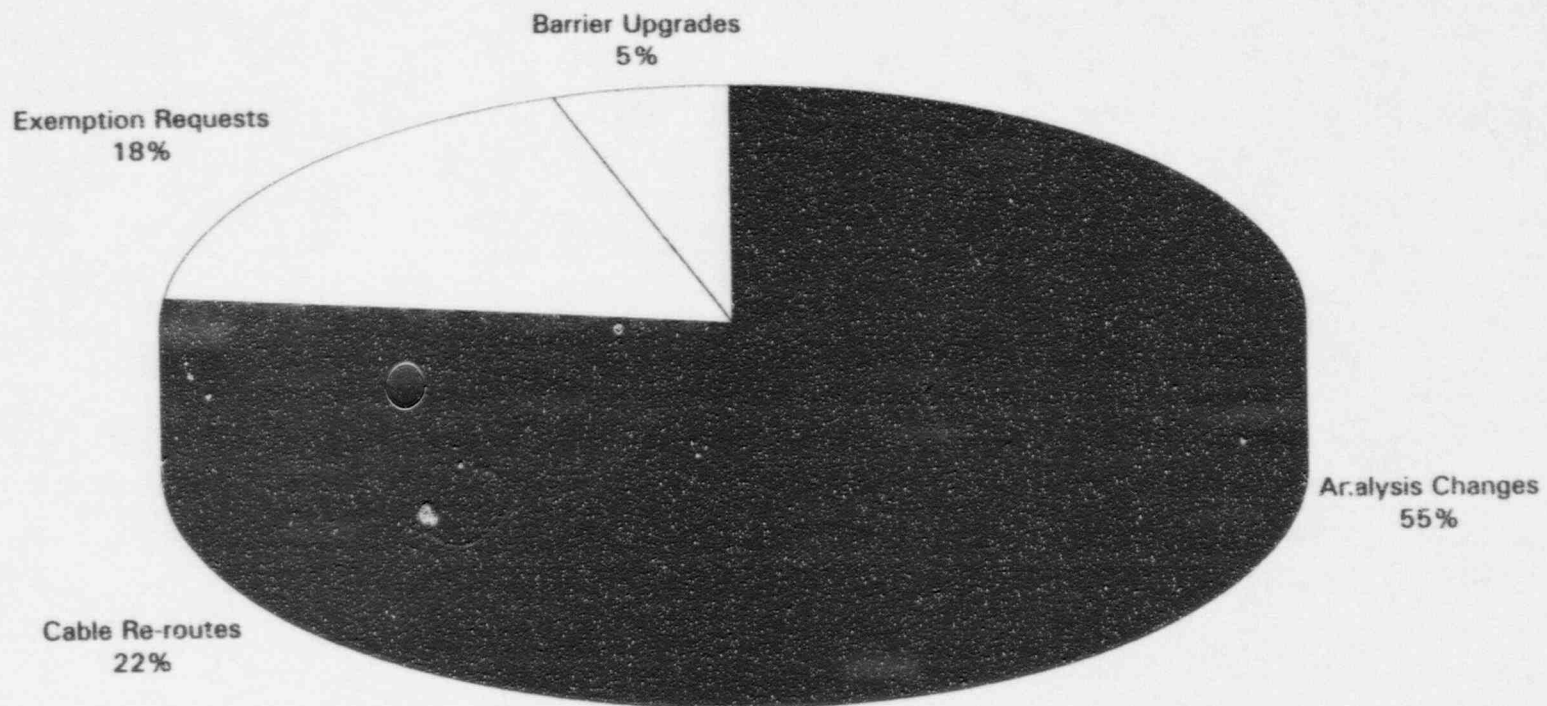
Resolution Evaluation & Selection

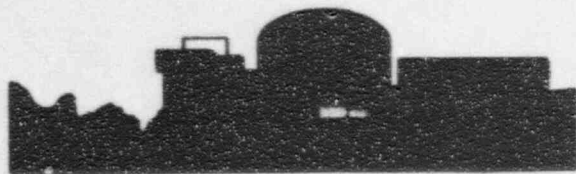
- ✦ **Appendix R Re-analysis Solutions are the Primary consideration for 77% of the Raceways**
- ✦ **Exemption Requests are the Primary Consideration for 18% of the Raceways**
- ✦ **Upgrade / Replacement Barriers are the Primary Consideration for 5% of the Raceways**
- ✦ **Integrated Action Plan Will be Submitted by Dec. 31, 1995**



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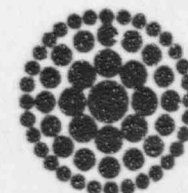
Preliminary Thermo-Lag Resolution Results



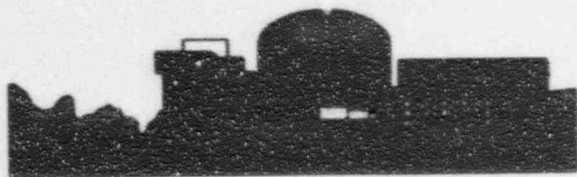


Agenda

- | | | |
|------|------------------------------------|------------------|
| I. | Introduction | W. L. Rossfeld |
| II. | Overview of Thermo-Lag Strategy | W. L. Rossfeld |
| A. | Preliminary Results of Re-analysis | N. E. Fioravante |
| B. | Results of NEI Application Guide | J. L. Dymek |
| C. | Alternate Barrier Test Program | W. L. Rossfeld |
| D. | Results of EPRI - TC Effort | N. E. Fioravante |
| E. | Preliminary Results | W. L. Rossfeld |
| III. | Fire Test Configurations | J. L. Dymek |
| IV. | Reactor Building Exemption Request | S. C. Powell |
| V. | Summary | W. L. Rossfeld |

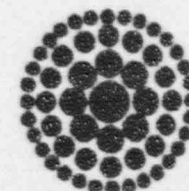


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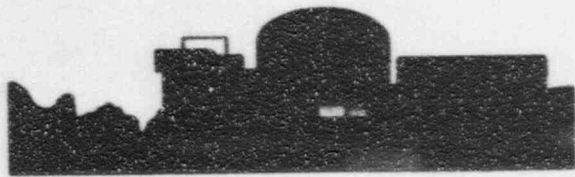


Purpose

- ✦ **Present Preliminary Results of FPC's Thermo-Lag Resolution Strategy**
- ✦ **Review the Upcoming Fire Test Program with Respect to Bounding Configurations**
- ✦ **Present the Exemption Request for the Reactor Building**

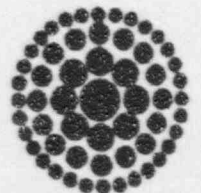


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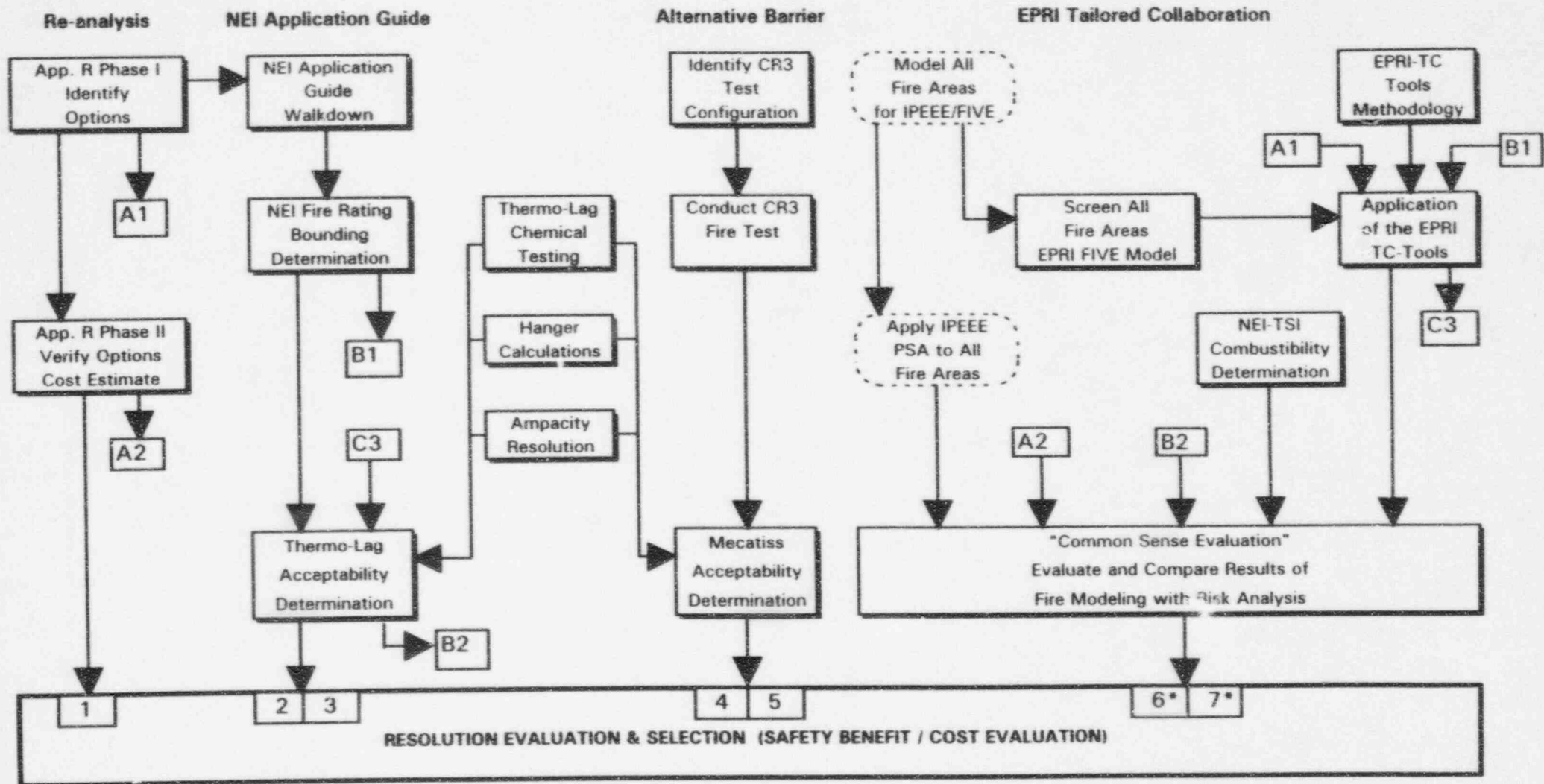
EPRI Tailored Collaboration

- † **Completed Initial PSA of All Fire Areas**
- † **Completed Development of the EPRI-TC Tools**
- † **Completed Initial Application of the EPRI-TC**
- † **Completed Initial “Classical” Fire Protection Assessment**
- † **Completed Preliminary “Common Sense” Evaluations**
- † **Candidates for Exemptions, Based on Preliminary Results Are Control Complex, Auxiliary Building, and Intermediate Building**



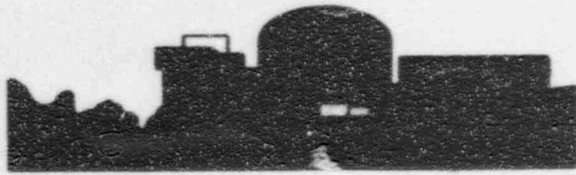
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FLORIDA POWER CORPORATION THERMO-LAG RESOLUTION STRATEGY



1. Thermo-Lag not required (analysis/safety evaluation or modification)
2. Thermo-Lag is a 1 hr / 3hr rated barrier
3. Thermo-Lag would be a 1hr / 3hr barrier with minor upgrades
4. Thermo-Lag would be acceptable with Mecatiss overlay

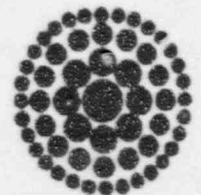
5. Thermo-Lag is unacceptable - will be replaced with Mecatiss
 6. Thermo-Lag is acceptable for the installed configuration*
 7. Thermo-Lag would be acceptable with additional fire protection*
- * These options require NRC approval of an exemption

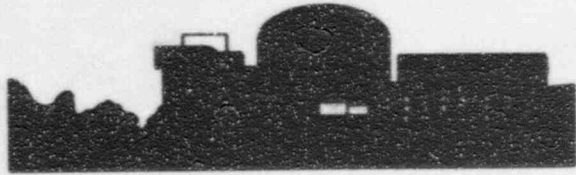


Appendix R

Re-analysis Activities

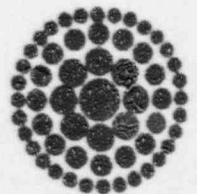
- ✦ Existing Thermo-Lag in 22 Fire Areas has been Evaluated
- ✦ Based on Analysis Changes (Offsite Power, Auxiliary Feedwater Pump, Makeup, EFIC/EFW) Means Have Been Identified to:
 - Eliminate all Thermo-Lag in 9 Fire Areas
 - Reduce Thermo-Lag in 11 Fire Areas
 - Overall 55% reduction in Raceways Requiring Protection
- ✦ Modifications Consisting Mainly of Cable Reroutes Will:
 - Eliminate Remaining Thermo-Lag in 5 Fire Areas
 - Further Reduce Thermo-Lag in 1 Additional Fire Area
 - Reduce Raceways Requiring Protection an Additional 22%
- ✦ Appendix R Re-analysis Activities Will Provide:
 - Elimination of All Thermo-Lag in 14 Fire Areas
 - Reduction of Thermo-Lag in 7 Fire Areas
 - One Fire Area Was Unaffected
 - An Overall 77% Reduction in the Raceways Requiring Protection

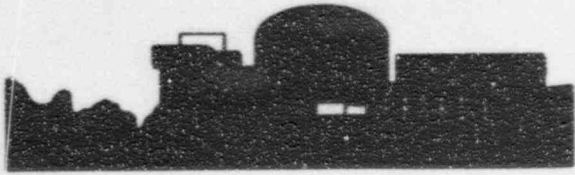




NEI Application Guide

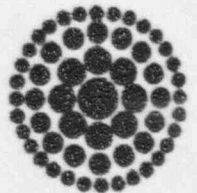
- ✦ **NEI Application Guide Walkdown Completed for Sample Set of Raceways**
- ✦ **NEI Fire Rating Bounding Determination Completed for Sample Set of Raceways**
- ✦ **NEI Application Guide Did Not Result in Qualifying Existing 1 & 3 Hour Barriers**
- ✦ **Intervening Aluminum Conduits Complicated the Qualification of Fire Barriers**
- ✦ **The NEI Application Guide Did Not Lead to Resolution of Any Raceways**



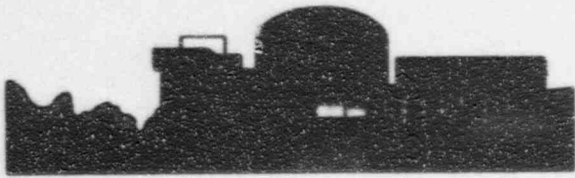


Alternate Barriers

- ✦ Identified Test Configurations to Bound Raceways**
- ✦ Test Assemblies Have Been Completed at U. L. - Awaiting Overlay Material**
- ✦ Two Upgrade Materials Have Been Evaluated (Mecatiss Selected)**

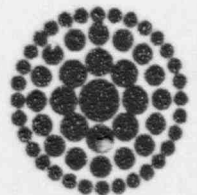


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Proposed Barrier Upgrade Approach

- ✦ **FPC Will Submit 5 Test Result Packages for Review**
- ✦ **Proposed NRC Review and Acceptance of Tests and Bounding Criteria to Generic Letter 86-10, Supplement 1**
- ✦ **FPC Will Use Test Results (After NRC Acceptance) to Evaluate Installations**
- ✦ **Mecatiss / B&W Will Install Upgrade / Replacement Material**
- ✦ **NRC Could Inspect Installed Configurations to Approved Test Results and Bounding Criteria**



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THERMO-LAG/MECATISS TEST PROGRAM SCHEDULE

ID	Action	Task Name	Start	Finish	Oct '95				Nov '95				Dec '95				
					10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24
1		Mecatiss Material Arrives	10/30/95	10/30/95					◆ 10/30								
2	B&W	Install Mecatiss on Surface Burn Sample	10/31/95	10/31/95					▮								
3	B&W	Install Mecatiss (Overlay) Ampacity	11/1/95	11/3/95					▮								
4	B&W	Install Mecatiss (Stand-Alone) Ampacity	11/6/95	11/7/95						▮							
5	UL	ASTM 84 Flame Spread Test	11/6/95	11/7/95						▮							
6		Ampacity Tests	11/6/95	11/29/95						▮							
7	UL	Conduct 2 TSI/Mecatiss Test	11/6/95	11/15/95						▮							
8	UL	Conduct 2 Mecatiss Only Tests	11/16/95	11/29/95							▮						
9	B&W	Install Mecatiss on Wall	11/7/95	11/10/95						▮							
10	UL	ASTM 136 Combustibility Test	11/8/95	11/9/95						▮							
11	B&W	Install Mecatiss 1/3 Hr Column	11/13/95	11/17/95							▮						
12	UL	Conduct 1-Hr Wall Test	11/16/95	11/17/95							▮						
13	B&W	Install Mecatiss 1/3 Hr Floor	11/20/95	12/1/95								▮					
14	UL	Conduct 1-Hr Vertical Col. Test	11/28/95	11/29/95									▮				
15	UL	Conduct 3-Hr Vertical Col. Test	11/30/95	12/1/95										▮			
16	UL	Conduct 1-Hr Horiz. Floor Test	12/5/95	12/6/95											▮		
17	UL	Conduct 3-Hr Horiz. Floor Test	12/7/95	12/8/95												▮	

W. L. Rossfeld
Manager

Task



Summary



Rolled Up Progress



Progress



Rolled Up Task

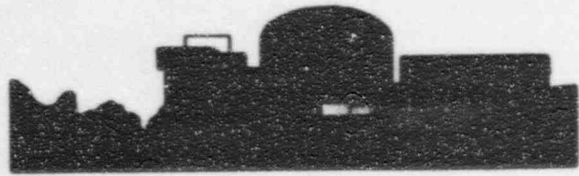


Milestone



Rolled Up Milestone





Reactor Building Exemption Request

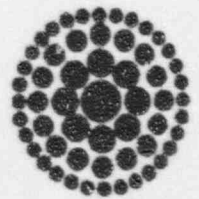
✦ **Current Compliance =
Protection by 1 Hour Thermo-Lag
Barriers as Radiant Energy Shields**

✦ **Information Notice 95-27**

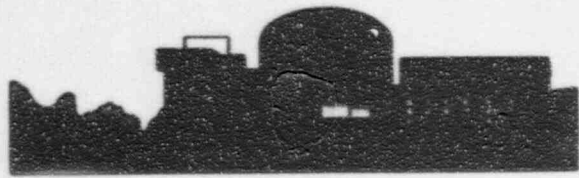
✦ **Evaluated**

- Protected Circuits
- Fire hazards
- Options

✦ **No Barriers or Radiant Energy
Shields Needed**



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Reactor Building Exemption Request

✦ Low Combustible Loading

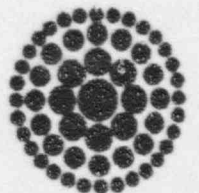
- IEEE 383 Rated Cable
- Large Volume
- High Ceilings

✦ Few Ignition Sources

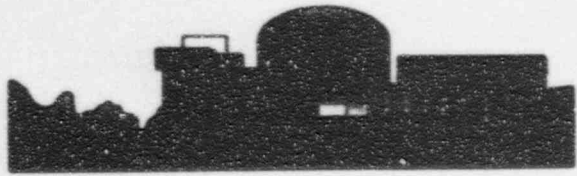
✦ Strong Administrative Controls

- No Transient Combustibles

✦ Automatic Fire Detection

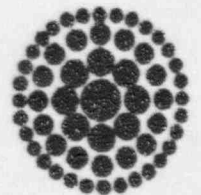


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Reactor Building Exemption Request

- ✦ **Multiple Redundancies with a High Degree of Separation**
- ✦ **Protection Provided by Conduit**
- ✦ **High Cable Damage Threshold**
- ✦ **Satisfaction of Exemption Criteria**



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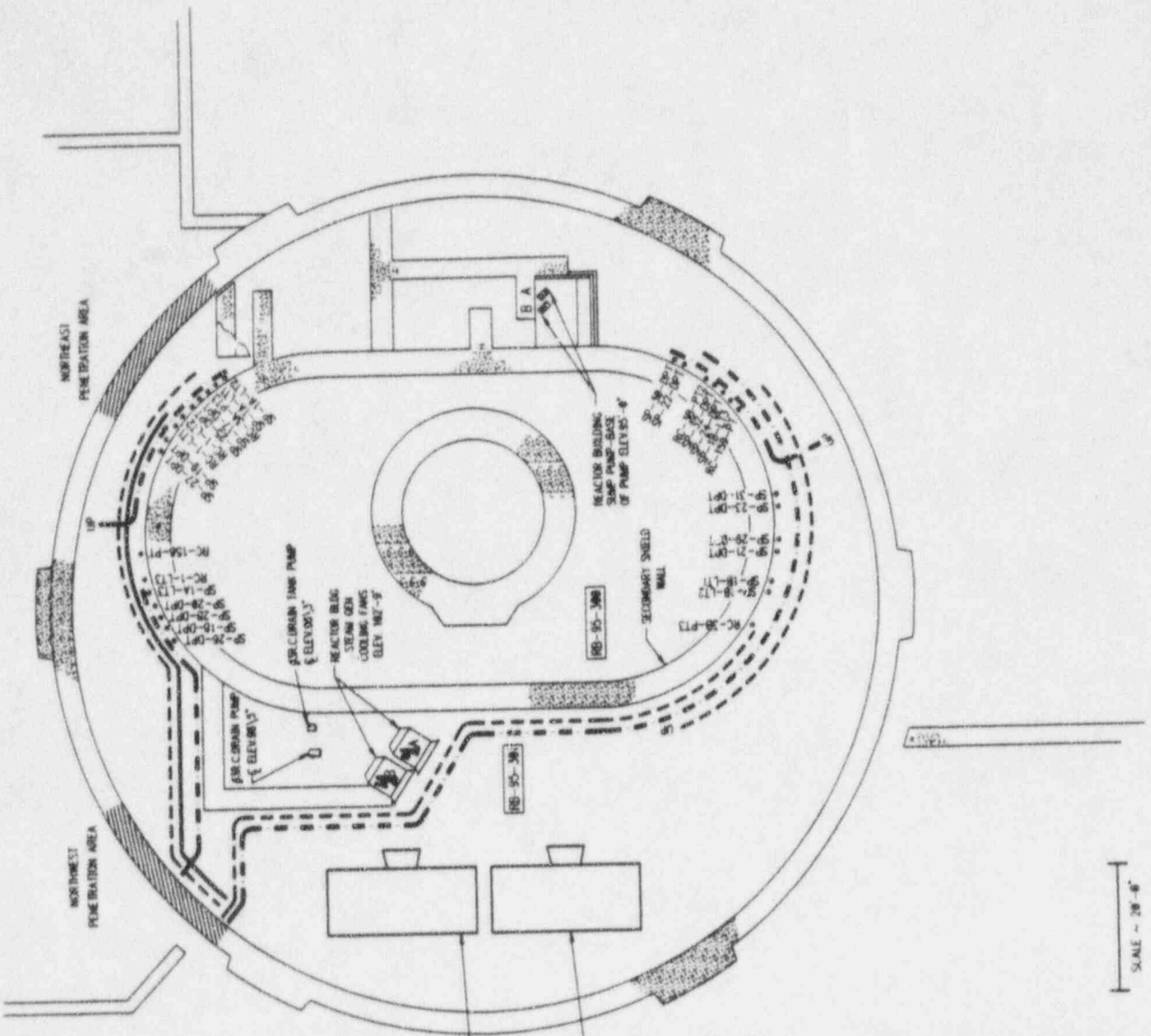


FIGURE 1
 REACTOR BUILDING
 BASEMENT FLOOR ELEV 75'-0" AN

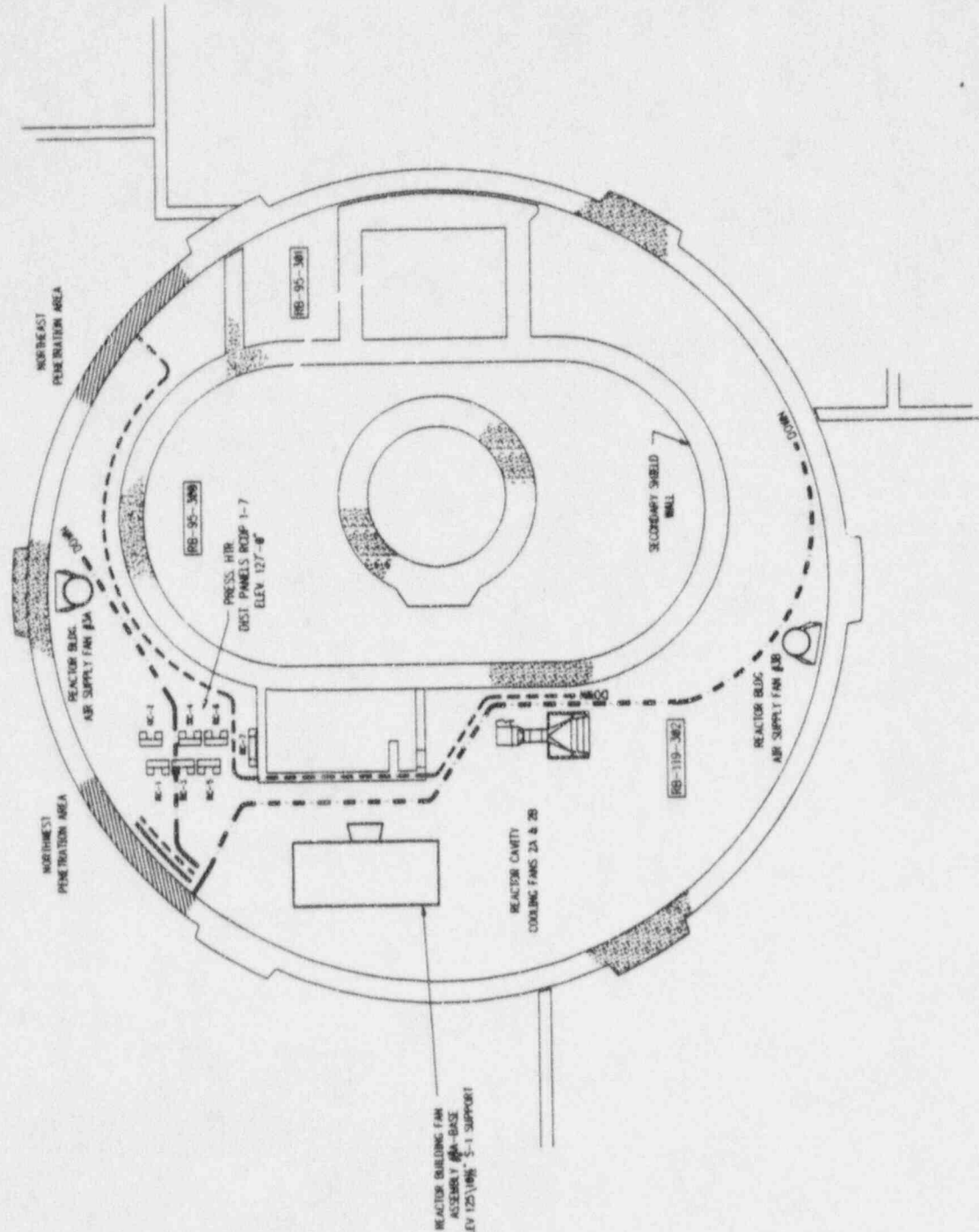
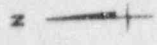
--- SG LEVEL
 --- PZR LEVEL
 --- RC PRESSURE

REACTOR BUILDING FAN
 ASSEMBLY #1-BASE
 ELEV 107'8" S-1 SUPPORT

REACTOR BUILDING FAN
 ASSEMBLY #2-BASE
 ELEV 107'8" S-1 SUPPORT

SCALE - 3/8" = 1'-0"

FIGURE 2
 REACTOR BUILD
 MEZZANINE FLOOR ELEV



- SG LEVEL
- P/JP LEVEL
- · - RC PRESSURE

TSI FIRE BARRIERS TOTALS - CONDUITS AND CABLE TRAYS 1 & 3 HOUR

CONDUIT SIZE	LINEAR FEET	SQUARE FEET	RATING
½"	24 FT	5 FT	1 HOUR
¾"	320 FT	64 FT	1 HOUR
¾"	70 FT	14 FT	3 HOUR
1"	185 FT	48.1 FT	1 HOUR
1"	181 FT	48.1 FT	3 HOUR
1½"	40 FT	15.6 FT	1 HOUR
1½"	0 FT	0 FT	3 HOUR
1½"	779 FT	303.89 FT	1 HOUR
1½"	378 FT	147.63 FT	3 HOUR
2"	701 FT	364.52 FT	1 HOUR
2"	58 FT	30.16 FT	3 HOUR
3"	1107 FT	874.53 FT	1 HOUR
3"	1552 FT	1226.08 FT	3 HOUR
4"	104 FT	109.2 FT	1 HOUR
4"	0 FT	0 FT	3 HOUR
5"	80 FT	104.8 FT	1 HOUR
5"	36 FT	47.16 FT	3 HOUR
6"	0 FT	0 FT	1 HOUR
6"	0 FT	0 FT	3 HOUR

TOTAL TSI INSTALLED FOR ONE HOUR CONDUITS: 3340 LINEAR FEET

TOTAL TSI INSTALLED FOR THREE HOUR CONDUITS: 2275 LINEAR FEET

TOTAL FOR RACEWAY CONDUITS IS 5615 LINEAR FEET

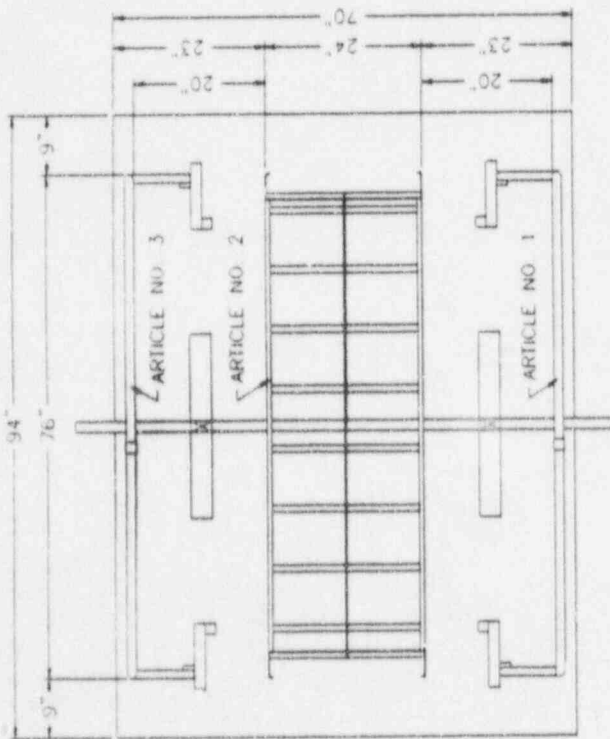
CABLE TRAY SIZE	LINEAR FEET	SQUARE FEET	RATING
4" X 4"	144 FT	144 FT	1 HOUR
4" X 4"	0 FT	0 FT	3 HOUR
6" X 4"	0 FT	0 FT	1 HOUR
6" X 4"	51 FT	102 FT	3 HOUR
6" X 6"	9 FT	18 FT	1 HOUR
6" X 6"	206 FT	412 FT	3 HOUR
12" X 4"	178 FT	534 FT	1 HOUR
12" X 4"	40 FT	152 FT	3 HOUR
12" X 6"	72 FT	216 FT	1 HOUR
12" X 6"	122 FT	386 FT	3 HOUR
18" X 4"	0 FT	0 FT	1 HOUR
18" X 4"	0 FT	0 FT	3 HOUR
18" X 6"	144 FT	576 FT	1 HOUR
18" X 6"	72 FT	288 FT	3 HOUR
24" X 4"	290 FT	1330 FT	1 HOUR
24" X 4"	24 FT	120 FT	3 HOUR
24" X 6"	657 FT	3285 FT	1 HOUR
24" X 6"	126 FT	630 FT	3 HOUR

TOTAL TSI INSTALLED FOR ONE HOUR CABLE TRAYS IS: 1494 LINEAR FEET

TOTAL TSI INSTALLED FOR THREE HOUR CABLE TRAYS IS: 641 LINEAR FEET

TOTAL FOR CABLE TRAY RACEWAY IS 2135 LINEAR FEET

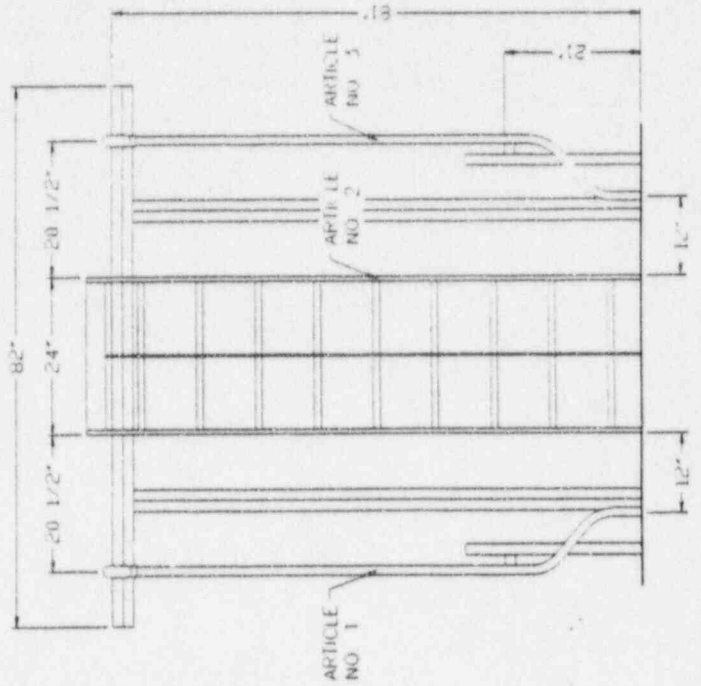
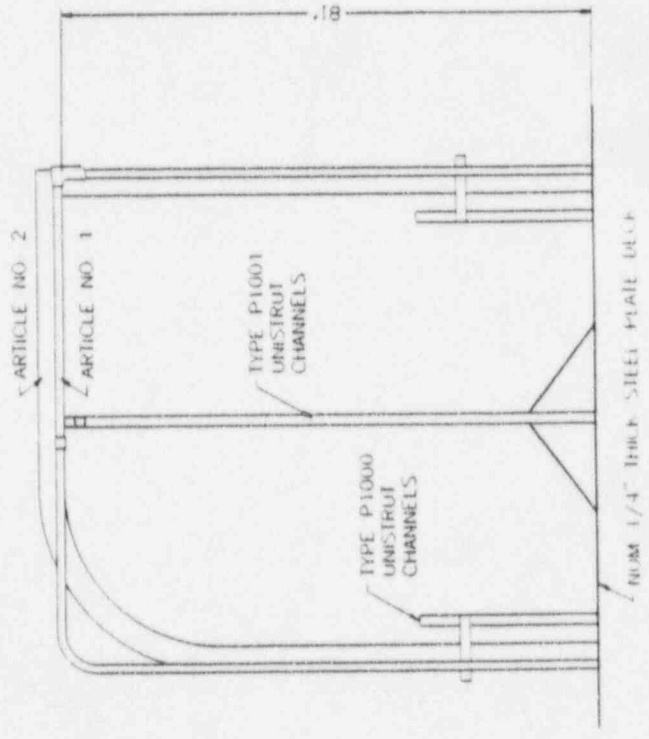
GRAND TOTAL FOR ALL RACEWAYS COMBINED TSI INSTALLED IS : 7750 LINEAR FEET



ARTICLE NO. 1 IS NOM 3/4" DIAM RIGID ALUM FITTING WITH 5" RADIAL BENDS AND LB FITTING CONTAINING A SINGLE NO. 8 AWG BARE COPPER CONDUCTOR

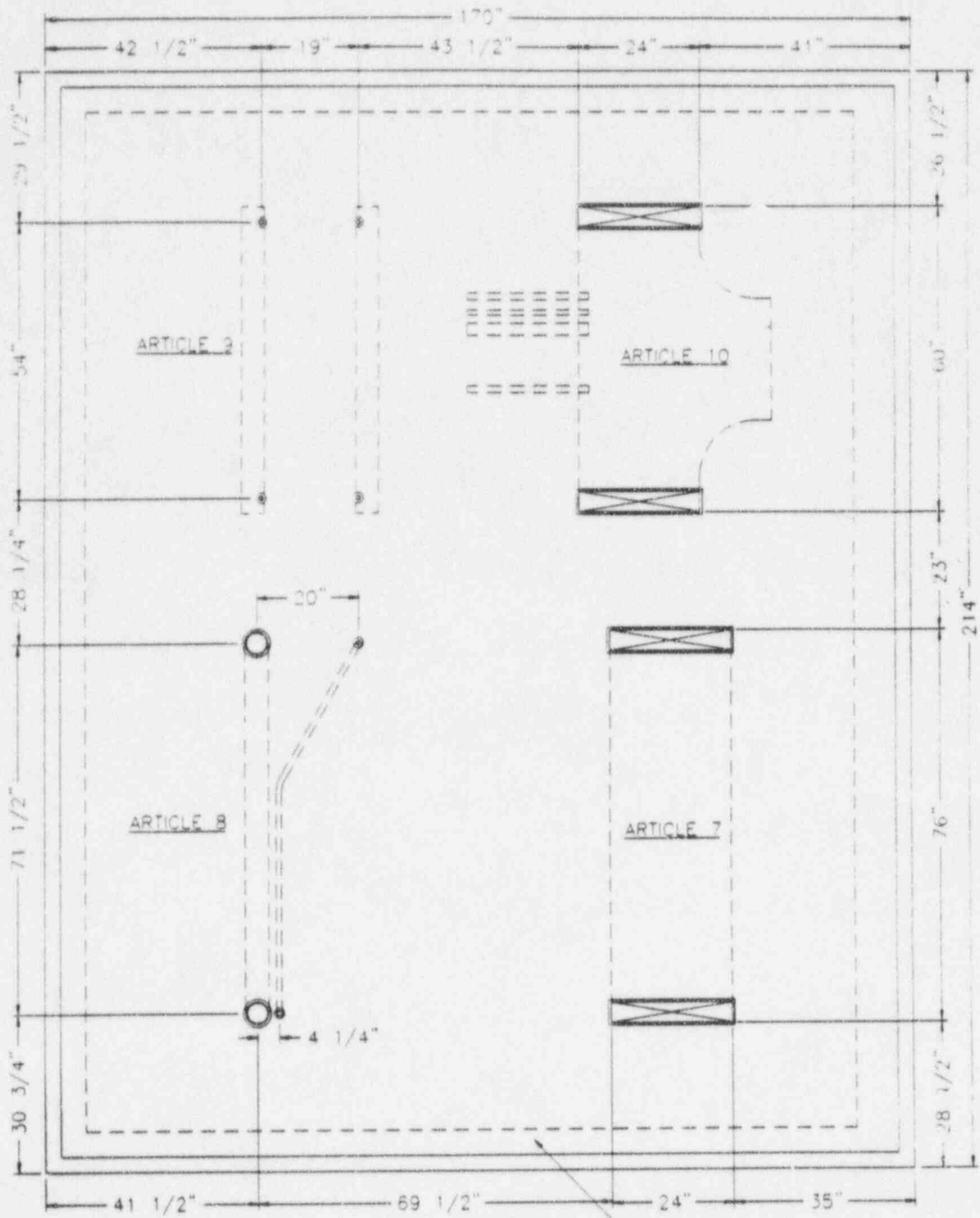
ARTICLE NO. 2 IS NOM 4" BY 24" OPEN-LAUNDER ALUM CABLE TRAY WITH 24" RADIAL BEND AND 90° SHARP BEND CONTAINING A SINGLE NO. 8 AWG BARE COPPER CONDUCTOR ALONG ITS LONGITUDINAL CENTERLINE

ARTICLE NO. 3 IS NOM 3/4" DIAM RIGID ALUM CORRODIT WITH 5" RADIAL BENDS AND LB FITTING CONTAINING A SINGLE NO. 8 AWG BARE COPPER CONDUCTOR

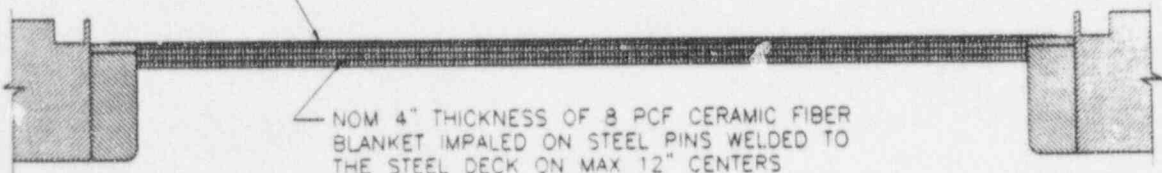


CABLE TRAY HOPE DETAIL TEST DECK NO. 1

NORTH

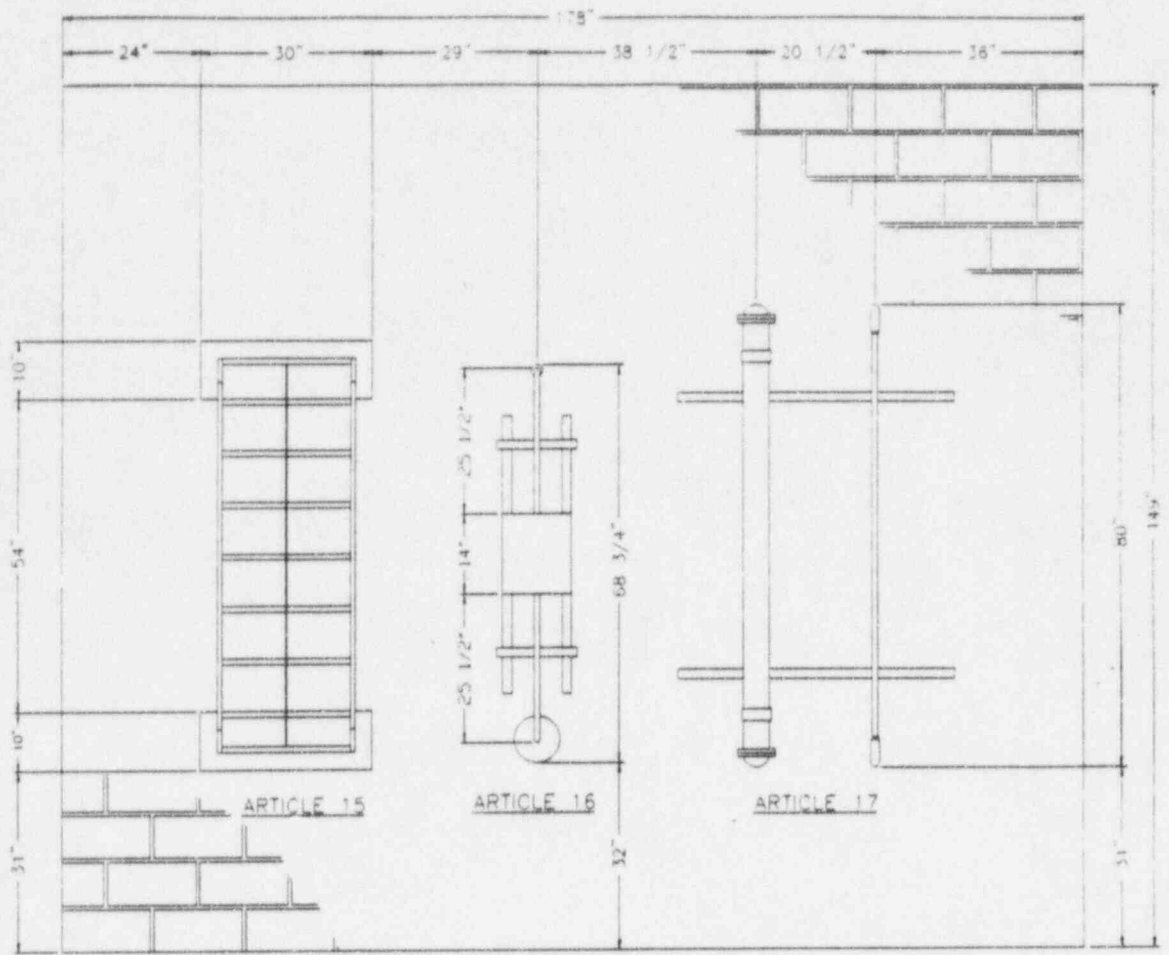


NOM 1/4" THICK STEEL PLATE DECK
REINFORCED WITH STEEL ANGLES



NOM 4" THICKNESS OF 8 PCF CERAMIC FIBER
BLANKET IMPALED ON STEEL PINS WELDED TO
THE STEEL DECK ON MAX 12" CENTERS

CONSTRUCTION DETAILS -
TEST DECK NO. 3



CONSTRUCTION DETAILS - TEST DECK NO. 5

TEST DECK SEGMENTS

Test Deck 1 (One-Hour Column Furnace Fire Test)

Article 1 (Fire Barrier Stand-Alone Product Test for 3/4" Aluminum Conduit with Unistrut P1001 Support)

Article 1, Segment 1	3/4" Conduit Vertical MTS-1
Article 1, Segment 2	3/4" Conduit Radial MTS-1
Article 1, Segment 3	3/4" Conduit Horizontal MTS-1
Article 1, Segment 4	3/4" Conduit/Support Interface MTS-1
Article 1, Segment 5	3/4" Conduit Fitting MTS-1
Article 1, Segment 6	3/4" Conduit Vertical MTS-1 (See Article 1, Segment 1)

Article 2 (Fire Barrier Combination of Stand-Alone and Upgrade for 24" x 4" Aluminum Ladderback Cable Tray with Unistrut P1001 Support)

Article 2, Segment 1	24" Tray Vertical MPF-60
Article 2, Segment 2	24" Tray Radial MPF-60
Article 2, Segment 3	24" Tray Horizontal MPF-60
Article 2, Segment 4	24" Tray/Support Interface MPF-60
Article 2, Segment 5	24" Tray Horizontal Transition MPF-60/MTS-1
Article 2, Segment 6	24" Tray Vertical MTS-1

Article 3 (Fire Barrier Upgrade Product for 3/4" Aluminum Conduit Using Shaved Thermo-Lag Sections with Unistrut P1001 Support)

Article 3, Segment 1	3/4" Conduit Vertical MPF-60
Article 3, Segment 2	3/4" Conduit Radial MPF-60
Article 3, Segment 3	3/4" Conduit Horizontal MPF-60
Article 3, Segment 4	3/4" Conduit/Support Interface MPF-60
Article 3, Segment 5	3/4" Conduit Fitting MPF-60
Article 3, Segment 6	(See Article 3, Segment 1)

Test Deck 2 (Three-Hour Column Furnace Fire Test)

Article 4 (Fire Barrier Stand-Alone Product Test for 3/4" Aluminum Conduit with Unistrut P1001 Support)

Article 4, Segment 1	3/4" Conduit Vertical MTS-3
Article 4, Segment 2	3/4" Conduit Radial MTS-3
Article 4, Segment 3	3/4" Conduit Horizontal MTS-3
Article 4, Segment 4	3/4" Conduit/Support Interface MTS-3
Article 4, Segment 5	3/4" Conduit Fitting MTS-3
Article 4, Segment 6	3/4" Conduit Vertical MTS-3 (See Article 4, Segment 1)

Article 5 (Fire Barrier Combination of Stand-Alone and Upgrade for 24" x 4" Aluminum Ladderback Cable Tray with Unistrut P1001 Support)

Article 5, Segment 1	24" Tray Vertical MPF-180
Article 5, Segment 2	24" Tray Radial MPF-180
Article 5, Segment 3	24" Tray Horizontal MPF-180
Article 5, Segment 4	24" Tray/Support Interface MPF-180
Article 5, Segment 5	24" Tray Horizontal Transition MPF-180/MTS-3
Article 5, Segment 6	24" Tray Vertical MTS-3

Article 6 (Fire Barrier Upgrade Product for 3/4" Aluminum Conduit with Unistrut P1001 Support)

Article 6, Segment 1	3/4" Conduit Vertical MPF-180
Article 6, Segment 2	3/4" Conduit Radial MPF-180
Article 6, Segment 3	3/4" Conduit Horizontal MPF-180
Article 6, Segment 4	3/4" Conduit/Support Interface MPF-180
Article 6, Segment 5	3/4" Conduit Fitting MPF-180
Article 6, Segment 6	3/4" Conduit Vertical MPF-180 (See Article 6, Segment 1)

Test Deck 3 (One-Hour Floor Furnace Test)

Article 7 (Fire Barrier Stand Alone Product Test for 24" x 4" Ladderback Aluminum Cable Tray on 3" x 4" Angle Steel Supports)

Article 7, Segment 1	24" Tray Vertical MTS-1 (See Test 1, Article 1)
Article 7, Segment 2	24" Tray Radial MTS-1
Article 7, Segment 3	24" Tray Horizontal MTS-1
Article 7, Segment 4	24" Tray/Support Interface MTS-1
Article 7, Segment 5	24" Tray Radial MTS-1 (See Article 7, Segment 2)
Article 7, Segment 6	24" Tray Vertical MTS-1 (See Test 1, Article 1)

Article 8 (Fire Barrier Upgrade Product for 3/4" and 4" Parallel and 30° Split Conduit Run on Unistrut P1001 Supports Using Alternative Thermo-Lag Construction Styles)

Article 8, Segment 1	3/4" Vertical Conduit Preshape MPF-60
Article 8, Segment 2	4" Vertical Conduit Preshape MPF-60
Article 8, Segment 3	3/4" and 4" Conduit Gang Box MPF-60
Article 8, Segment 4	3/4" and 4" Conduit/Support Interface MPF-60
Article 8, Segment 5	3/4" and 4" Conduit Wye MPF-60
Article 8, Segment 6	3/4" Conduit Horizontal MPF-60
Article 8, Segment 7	3/4" Conduit Radial MPF-60
Article 8, Segment 8	3/4" Conduit Vertical MPF-60
Article 8, Segment 9	4" Conduit Horizontal MPF-60
Article 8, Segment 10	4" Conduit Radial MPF-60
Article 8, Segment 11	4" Conduit Vertical MPF-60

Article 9 (Fire Barrier Upgrade Product for 3/4" Conduit Coupled with Unistrut P1001 and Intervening Non-essential 4" and 3/4" Conduits with Variable Unistrut Fire Seal Designs)

Article 9, Segment 1 Front Left MPF-60 with 1" Thermo-Lag Plug
Article 9, Segment 2 Front Right MPF-60 with no Thermo-Lag Plug
Article 9, Segment 3 Back Left MPF-60 with 2" Thermo-Lag Plug
Article 9, Segment 4 Back Right MPF-60 with 4" Thermo-Lag Plug

Article 10 (Fire Barrier Upgrade for Cable Tray "Tee" Section With 3" x 4" Angle Steel Supports and a Multiple Conduit Transition Arrangement)

Article 10, Segment 1 24" x 4" with 41" Tee Cross Section MPF-60
Article 10, Segment 2 24" x 4" Horizontal Radial Bends MPF-60
Article 10, Segment 3 Multiple Conduit Transition with 6" Kaowool and RTV Silicone Plugs MPF-60
Article 10, Segment 4 Single Conduit Transition with 3" Kaowool and RTV Silicone Plugs MPF-60

Test Deck 4 (Three-Hour Floor Furnace Test)

Article 11 (Fire Barrier Stand Alone Product Test for 24" x 4" Ladderback Aluminum Cable Tray on 3" x 4" Angle Steel Supports)

Article 11, Segment 1 24" Tray Vertical MTS-3 (See Test 2, Article 5)
Article 11, Segment 2 24" Tray Radial MTS-3
Article 11, Segment 3 24" Tray Horizontal MTS-3
Article 11, Segment 4 24" Tray/Support Interface MTS-3
Article 11, Segment 5 24' Tray Radial MTS-3 (See Article 11, Segment 2)
Article 11, Segment 6 24" Tray Vertical MTS-3 (See Test 2, Article 5)

Article 12 (Fire Barrier Upgrade Product for 3/4" and 4" Parallel and 30° Split Conduit Run on Unistrut P1000 Supports Using Alternative Thermo-Lag Construction Styles)

Article 12, Segment 1 3/4" and 4" Conduit Preshape to Preshape MPF-180
Article 12, Segment 2 3/4" and 4" Vertical Conduit Preshape MPF-180
Article 12, Segment 3 3/4" and 4" Conduit Gang Box MPF-180
Article 12, Segment 4 3/4" and 4" Conduit/Support Interface MPF-180
Article 12, Segment 5 3/4" and 4" Conduit Wye MPF-180
Article 12, Segment 6 3/4" Conduit Horizontal MPF-180
Article 12, Segment 7 3/4" Conduit Radial MPF-180
Article 12, Segment 8 3/4" Conduit Vertical MPF-180
Article 12, Segment 9 4" Conduit Horizontal MPF-180
Article 12, Segment 10 4" Conduit Radial MPF-180
Article 12, Segment 11 4" Conduit Vertical MPF-180

Article 13 (Fire Barrier Upgrade Product for 3/4" Conduit Coupled with Unistrut P1001 and Intervening Non-essential 4" and 3/4" Conduits with Variable Unistrut Fire Seal Designs)

Article 13, Segment 1 Front Left MPF-180 with 1" Thermo-Lag Plug
Article 13, Segment 2 Front Right MPF-180 with no Thermo-Lag Plug
Article 13, Segment 3 Back Left MPF-180 with 2" Thermo-Lag Plug
Article 13, Segment 4 Back Right MPF-180 with 4" Thermo-Lag Plug

Article 14 (Fire Barrier Upgrade for Cable Tray "Tee" Section with Multiple Conduit Transition Arrangement)

Article 14, Segment 1 24" x 4" Tee Section MPF-180
Article 14, Segment 2 24" x 4" Horizontal Radial Bends MPF-180
Article 14, Segment 2 Multiple Conduit Transition with 8" Kaowool and RTV Silicone Plugs MPF-180
Article 14, Segment 3 Single Conduit Transition with 4" Kaowool and RTV Silicone Plugs MPF-180

Test Deck 5 (One-hour Wall Test)

Article 15 (Fire Barrier Upgrade for Cable Tray in Vertical Configuration with Unistrut P1000 Attachment to Wall)

Article 15, Segment 1 24" Tray 90° Bend (Marinite Interface) MPF-60
Article 15, Segment 2 24" Tray Vertical (Wall Interface) MPF-60
Article 15, Segment 3 24" Tray 90° Bend (Silicone Foam Interface) MPF-60

Article 16 (1" Aluminum Conduit and 12" x 12" Junction Box)

Article 16, Segment 1 Conduit 90° (Marinite Interface) MPF-60
Article 16, Segment 2 Conduit Vertical MPF-60
Article 16, Segment 3 Junction Box MPF-60
Article 16, Segment 4 Conduit Vertical MPF-60
Article 16, Segment 5 Conduit 90° (Silicone Foam Interface) MPF-60

Article 17 (1" and 4" Conduit with Unistrut Interferences)

Article 17, Segment 1 1" Conduit with Interference MPF-60
Article 17, Segment 2 1" Conduit with Interference MTS-1
Article 17, Segment 3 4" Conduit with Interference MPF-60
Article 17, Segment 4 4" Conduit with interference MTS-1

TEST SEGMENT SUMMARY

ASSEMBLY	MTS-1	MPF-60	MTS-3	MPF-180
1	5 (1R)			
2	1	5		
3		5 (1R)		
4			5 (1R)	
5			1	5 (1R)
6				5 (1R)
7	3 (3R)			
8		7 (4R)		
9		(4 P)		
10		2 (2P)		
11			3 (3R)	
12				7 (4R)
13				(4 P)
14				2 (2P)
15		3		
16		3 (2R)		
17	2	2		

TOTAL SEGMENTS

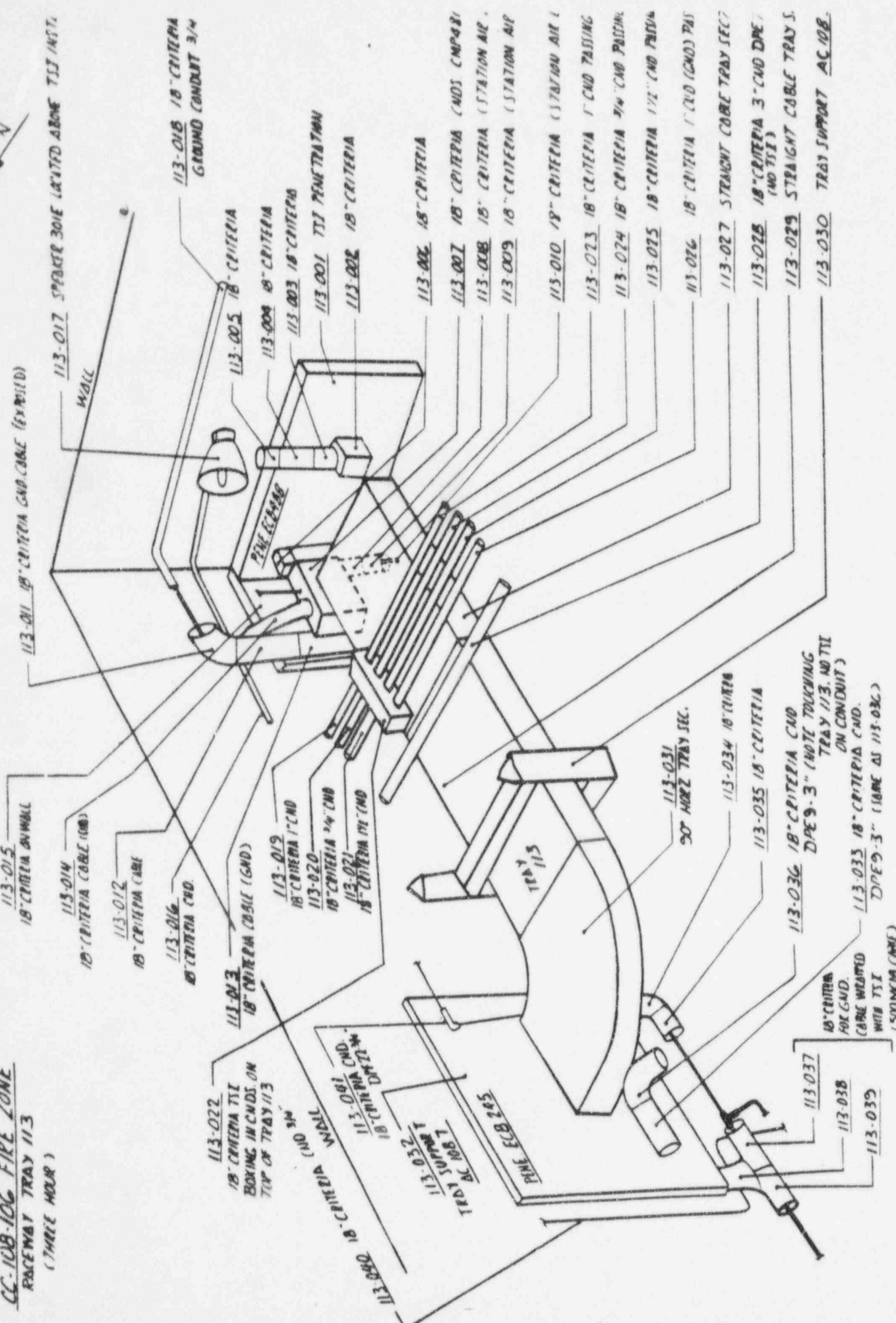
64	13 (U)	25 (U)	9 (U)	17 (U)
18	4 (R)	5 (R)	4 (R)	5 (R)
12		6 (P)		6 (P)

(U) Unique

(R) Repeat

(P) Plug

CC-108-106 FIRE ZONE
RACEWAY TRAY 113
 (THREE HOUR)

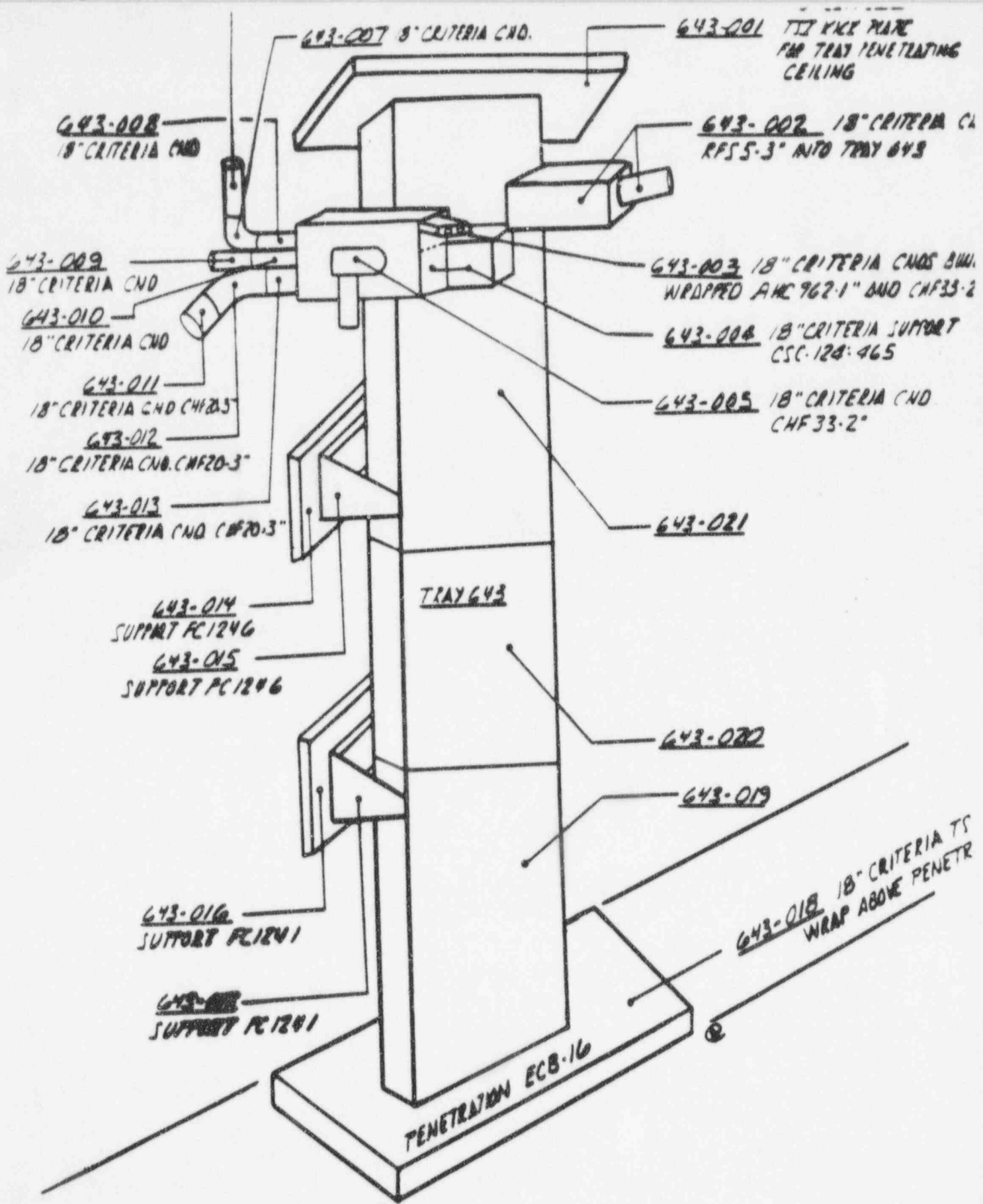


- 113-015 18" CRITERIA GND. CABLE (EXTENDED)
- 113-016 18" CRITERIA GND. CONDUIT 3/4"
- 113-017 SPACER 301E LIMITED ABOVE TJI INST.
- 113-018 18" CRITERIA
- 113-019 18" CRITERIA 1" CND
- 113-020 18" CRITERIA 3/4" CND
- 113-021 18" CRITERIA 1/2" CND
- 113-022 18" CRITERIA TJI BOXING IN CHDS ON TOP OF TRAY 113
- 113-023 18" CRITERIA 1" CND TAPPING
- 113-024 18" CRITERIA 3/4" CND PRISON
- 113-025 18" CRITERIA 1/2" CND PRISON
- 113-026 18" CRITERIA 1" CND (CND) PAS
- 113-027 STRAIGHT CORE TRAY SEC
- 113-028 18" CRITERIA 3" CND DPE (NO TJI)
- 113-029 STRAIGHT CABLE TRAYS
- 113-030 TRAY SUPPORT AC 108

- 113-031 90° HORIZ TRAY SEC.
- 113-032 18" CRITERIA TJI
- 113-033 18" CRITERIA CND
- 113-034 18" CRITERIA
- 113-035 18" CRITERIA
- 113-036 18" CRITERIA CND DPE 9-3" (NOTE TOUCHING TRAY 113, NO TJI ON CONDUIT)
- 113-037 18" CRITERIA CND
- 113-038 18" CRITERIA CND
- 113-039 18" CRITERIA CND

- 113-040 18" CRITERIA GND. CND
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TRAY 643

PENETRATION ECB-16

CC-124-111 FIRE ZONE
RECEIVING TRAY 643

