



CONNECTICUT YANKEE ATOMIC POWER COMPANY

BERLIN, CONNECTICUT

P. O. BOX 270 HARTFORD, CONNECTICUT 06101

TELEPHONE
203-666-6911

July 14, 1980

Docket No. 50-213
B10035

Director of Nuclear Reactor Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Haddam Neck Plant
SEP Topic III-12
Environmental Qualification of Electrical Equipment

On June 30 and July 1, 1980, a site audit on the subject of environmental qualification of electrical equipment was conducted by the NRC Staff and their contractor on this issue, Franklin Research Center (FRC). The major accomplishments of this site audit included the identification of the documentation needs of FRC and the compilation of the open items which will require future action. To facilitate FRC's review of the Haddam Neck Plant, numerous docketed references and other informational materials were provided during the audit. A list of the material provided during the audit is included as Attachment 1.

The open items for which information is available at this time are addressed as follows:

- (1) During the audit, Connecticut Yankee Atomic Power Company (CYAPCO) explained that plant-specific LOCA calculations were in progress to identify environmental profiles in the containment. This detailed information remains scheduled for submittal to the NRC Staff the latter part of August, 1980. For the interim period, FRC requested that a temperature profile be provided to complement the FDSA pressure profile provided to FRC during the audit in accordance with the information presented in the March 6, 1978 letter, D. C. Switzer to V. Stello, Jr. The temperature profile included as Attachment 2 is hereby provided. It is emphasized that analytical efforts are in progress to substantiate the adequacy of the existing qualification documentation for equipment within the containment building.

PRK

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

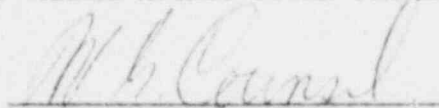
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- (2) During the audit, FRC requested information regarding submergence in the containment building. In confirmation of the information provided during the audit, CYAPCO's evaluations have concluded that the conservative determination of the maximum inventory which could result from a loss of coolant accident is 286,000 gallons. This corresponds to a depth of water of 34 inches above the containment floor. This water volume represents the entire contents of the reactor coolant system and an extremely conservative representation of the inventory available from the refueling water storage tank (RWST).
- (3) FRC requested a copy of the reformed qualification information available from the original environmental qualification evaluation. This document is the W. G. Council letter to D. L. Ziemann dated December 29, 1978 and is provided as Attachment 3.
- (4) During the audit, FRC requested specifications for the Kerite safety related cabling in use at the Haddam Neck Plant. In fulfillment of that request, a summary of the production test documentation follows. More detail on the Kerite cabling is provided as Attachment 4.
- (5) During the audit, CYAPCO made available to FRC a list of references utilized in the qualification effort. This listing of 30 references is included as Attachment 5. In accordance with FRC's request, each of these references is enclosed with the exception of Items 2, 14, 17, and 30, the latter of which is no longer applicable to the qualification effort.

The above information summarizes the additional data which has been made available since the date of the site audit. One copy of this letter is being sent by expedited mail to FRC to facilitate their review. In accordance with CYAPCO's understanding at the conclusion of the site audit, additional information will be expedited to FRC as soon as it becomes available.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY



W. G. Council
Senior Vice President

Attachments

ATTACHMENT 1

HADDAM NECK PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

DOCUMENTATION PROVIDED TO FRANKLIN RESEARCH CENTER
DURING SITE AUDIT AT THE HADDAM NECK PLANT

JUNE 30 AND JULY 1, 1980

HADDAM NECK PLANT
DOCUMENTATION PROVIDED TO FRANKLIN RESEARCH CENTER
DURING SITE AUDIT AT THE HADDAM NECK PLANT

JUNE 30 AND JULY 1, 1980

- (1) Containment LOCA Pressure Curve from Section 3 of the FDSA.
- (2) Ventilation Drawings of the Plant.
- (3) Piping and Instrumentation Drawings of the Plant.
- (4) Additional Qualification Work Sheets (Draft).
- (5) Re-formatted Environmental Qualification Work Sheets. These were excerpted from a December 29, 1978 letter from W. G. Council to D. L. Ziemann.
- (6) Containment Environment
 - a) Chemical Composition of RWST, Safety Injection Pump Fluid, Containment Spray (if used)

Borated water, no other chemicals - 1.5% boric acid
 - b) "Normal" Containment Environment - Re: May 1, 1980 letter

Temperature	90°F - 130°F
Relative Humidity	~50%
Pressure	1.5 - 2.0 psig
	3.0 Technical Specification Maximum
- (7) Submergence Data (Draft)

260,000 gallons (capacity in excess of RWST) = 2.68 feet above containment floor
- (8) Fire Hazards Analysis Zones/Drawings
- (9) Radiation Profiles (Draft)
- (10) "Original" Environmental Qualification submittal - March 6, 1978 letter, D. C. Switzer to V. Stello, Jr.

NRC LETTERS

- (1) April 24, 1979 I&E Bulletin No. 79-06A.
- (2) November 21, 1979 All TMI Items.
- (3) November 30, 1979 Auxiliary Feedwater.
- (4) December 6, 1979 Auxiliary Feedwater.
- (5) December 7, 1979 Radiation Monitors.
- (6) December 12, 1979 Radiation Monitors.
- (7) December 13, 1979 Containment Isolation.
- (8) December 14, 1979 Containment Isolation.
- (9) December 18, 1979 Auxiliary Feedwater Flow Indication.
- (10) December 18, 1979 Auxiliary Feedwater.
- (11) December 31, 1979 All TMI Items.
- (12) January 17, 1980 Containment Isolation.
- (13) January 31, 1980 All TMI Items.
- (14) March 3, 1980 Cable and Penetration Replacement.
- (15) March 6, 1980 Containment Water Level Indication.
- (16) March 28, 1980 Direct Indication of RORV's and Safties.
- (17) April 1, 1980 Post-Accident Sampling.
- (18) May 6, 1980 Post-Accident Sampling.
- (19) May 23, 1980 Containment Isolation.
- (20) June 10, 1980 Auxiliary Feedwater.
- (21) June 23, 1980 Post-Accident Sampling.

ATTACHMENT 2

HADDAM NECK PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

IN CONTAINMENT TEMPERATURE TRANSIENT FOLLOWING
CIRCUMFERENTIAL RUPTURE OF 27.5" REACTOR COOLANT LINE

JULY, 1980

HADDAM NECK PLANT
 IN CONTAINMENT TEMPERATURE TRANSIENT FOLLOWING
 CIRCUMFERENTIAL RUPTURE OF 27.5" REACTOR COOLANT LINE

°F

NOTE: This curve depicts the information presented in the D. C. Switzer letter to V. Stello, Jr., dated March 6, 1978.

260°F

100

10⁰ 10¹ 10² 10³ 10⁴ 10⁵

TIME - SEC.

46 6212

K&E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
 KEUFFEL & ESSER CO. MADE IN U.S.A.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

K&E

ATTACHMENT 3

HADDAM NECK PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

W. G. COUNCIL LETTER TO D. L. ZIEMANN
DATED DECEMBER 29, 1978



CONNECTICUT YANKEE ATOMIC POWER COMPANY

BERLIN, CONNECTICUT

P. O. BOX 270 HARTFORD, CONNECTICUT 06101

TELEPHONE
203-666-6911

December 29, 1978

Docket No. 50-213

Director of Nuclear Reactor Regulation
Attn: Mr. D. L. Ziemann, Chief
Operating Reactors Branch #2
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

- References: (1) W. G. Council letters to D. L. Ziemann dated
March 6, 1978 and July 27, 1978.
(2) D. L. Ziemann letter to W. G. Council dated
November 9, 1978.

Gentlemen:

Haddam Neck Plant
Electrical Equipment Environmental Qualification (EEQ)

In Reference (1), Connecticut Yankee Atomic Power Company (CYAPCO) submitted information on electrical EEQ to the NRC Staff. This information was compiled and reformatted into a standard listing by the NRC Staff and transmitted by Reference (2) to CYAPCO for review.

As requested, CYAPCO has reviewed the NRC Staff compilation. As a result of that review, a number of changes have been made; these changes are underlined on the attached listing.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

W. G. Council
Council
President

DUPLICATE DOCUMENT

Entire document previously
entered into system under:

ANO

7901110081

No. of pages: 9

ATTACHMENT 4

HADDAM NECK PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

PRODUCTION TEST DOCUMENTATION

JULY, 1980

Kerite Cables - Qualification under Franklin Report #F-C4020-1 and F-C4020-2.

Type of Cables - 3/C - #12AWG Cu, 7/C - #12AWG Cu, 9/C - #12AWG Cu, and 3CT - #500 KCM, Al (Power).

Power Cable (3CT-500RCM) - Insulation is HTR at 0.095" thick.
- Jacket is FR at 0.065" thick.

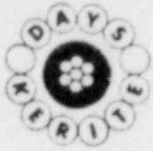
Control Cables (3/C, 7/C, and 9/C) - Insulation is FR at 0.05" thick.
- Jacket is FR at 0.065" thick for 3/C and 7/C and 0.080" thick for 9/C.

Brand Rex Cable - Qualification under Franklin Report #F-C4113. The type of cable 2/C - #16AWG, Cu, TSP (Instrumentation).

Instrumentation - Insulation is Crosslinked Polyethylene 0.030" thick.
- Jacket is Neoprene 0.045" thick (nominal).

49 Day Street
Seymour, Connecticut 06483
(203) 888-2591

Noted by MGP DEC 8 1978



the kerite company

December 4, 1978

Northeast Utilities Service Company
Room #110, South Annex Building
P.O. Box 270
Hartford, Connecticut 06101

Attention: Distribution Systems Engineer

Gentlemen:

The Kerite cable listed below was tested and inspected with the following results and was found to conform to the order.

Order No. 601658	Factory Order No. C-7076
Specification:	Factory Item No. 7A
Item No. 7	Millstone Station
Stock No. 13600015	

9 Conductor #12 AWG Strand 1KV 50 Mils FR Insulation (prim and 80 Mils FR Jacket. abled

PRELIMINARY TEST

The tests are made after the insulated conductors are immersed in water for at least twenty four (24) hours.

Voltage test 60 cycle AC, five (5) minutes -----	6.0 KV
Voltage test DC, five (5) minutes -----	18.0 KV

Insulation resistance exceeds our guaranteed value of 67.10 megohm-1000 feet at 60°F.

FINAL TEST AND INSPECTION

<u>Reel No.</u>	<u>Length in feet</u>	<u>Continuity Resistance at 68°F</u>	
		<u>Max. ohms/1000 ft</u>	<u>Min.</u>
J-8383	1077	1.614	1.577
J-8384	1097	1.620	1.602
J-8385	1077	1.586	1.559
J-8386	1077	1.586	1.559
J-8387	1077	1.620	1.614
	<u>5,405</u>		

Voltage test on shipping reel - 60 cycle AC, one (1) minute

to ground -----	6.0 KV
between conductors -----	12.0 KV

(Continued)



the kerite company

December 4, 1978

page 2
C7076-7A

MEASUREMENTS

<u>Reel No.</u>	<u>Insulation Thickness</u>		<u>Jacket Thickness</u>		<u>Outside Diameter</u>	
	<u>Min.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>	<u>Top</u>	<u>Pocket</u>
J-8383	.049	.054	.103	.135	.915	.915
J-8384	.050	.053	.109	.146	.920	.915
J-8385	.052	.054	.106	.134	.920	.910
J-8386	.051	.054	.107	.129	.915	.910
J-8387	.052	.054	.106	.125	.910	.910

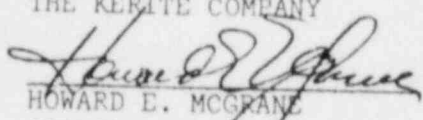
The Special Tests listed in Para. A of the QVEL have been submitted as a package to Millstone Job-site.

Copper Conductors meet the applicable requirements of ASTM B8, ASTM B33 or B189. Certificates of compliance from Kerite Sub-suppliers are on file at Seymour, Connecticut.

This is to certify that the cable shipped on this order has been packaged with the requirements of Specification P. O. 601658.

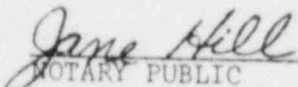
The packaging of reels is intended for and will be consistent with ANSI-N45.2.2.

Visual inspection at final inspection showed no evidence of water in the cable.

Certified by
THE KERITE COMPANY

HOWARD E. MCGRANE
QUALITY ASSURANCE MANAGER

HEMcG/m

SWORN TO AND SUBSCRIBED TO BEFORE ME THIS 4 DAY OF DECEMBER, 1978

 My Commission
NOTARY PUBLIC Expires March 31, 1979

Noted by MGP MAR 31 1980

49 Day Street
Seymour, Connecticut 06483
(203) 888-2591



the kerite company

March 28, 1980

Northeast Utilities Company
Post Office Box 270
South Annex Building, Room #10
Hartford, Connecticut 06101

re:Corrected copy of aff. of 3/21/80
Adding Measurements
cc:Conn. Yankee Atomic Pwr. Co.
c/o J. Sevigny
Injun Hollow Road
Haddam Neck, Ct 06438

Attention: District Systems Engineer

Gentlemen:

The Kerite cable listed below was tested and inspected with the following results and was found to conform to the order.

Order No. 702175
Specification: 970K
Item No. 1

Factory Order No. D-332
Factory Item No. 1A
Conn. Yankee Station

3 Conductor Twist 500MCM 1KV 95 Mils H.T. Kerite and 65 Mils FR Jacket.

PRELIMINARY TEST

The tests are made after the insulated conductors are immersed in water for at least twenty four (24) hours.

Voltage test 60 cycle AC, five (5) minutes ----- 11.5 KV
Voltage test DC, five (5) minutes ----- 34.5 KV

Insulation resistance exceeds our guaranteed value of 1910 megohm-1000 feet at 60°F.

FINAL TEST AND INSPECTION

Reel No.	Length in feet	Continuity Resistance at 68°F	
		Max. ohms/1000 ft	Min.
L-3609	1083	.021	.021
L-3610	1088	.021	.021
	<u>2,161</u>		

Voltage test on shipping reel - 60 cycle AC, one (1) minute

to ground ----- 14.0 KV
between conductors ----- 28.0 KV

(Continued)

March 28, 1980

page 2
D332-1A

MEASUREMENTS

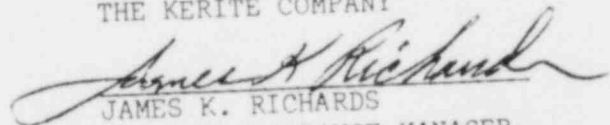
<u>Reel No.</u>	<u>Jacket Thickness</u>		<u>Outside Diameter</u>	
	<u>Min.</u>	<u>Max.</u>	<u>Top</u>	<u>Pocket</u>
L-3609	.060	.089	2.494	2.494
L-3610	.060	.089	2.505	2.505

Shield Continuity Test ----- No Shield

The Inspection of each end of each cable length fails to indicate presence of water.

Certified by

THE KERITE COMPANY


JAMES K. RICHARDS
QUALITY ASSURANCE MANAGER

JKR/m
SWORN TO AND SUBSCRIBED TO BEFORE ME THIS 31 DAY OF MARCH, 1980


NOTARY PUBLIC My Commission

Expires March 31, 1984

49 Day Street
Seymour, Connecticut 06483
(203) 888-2591



the kerite company

Northeast Utilities Company
Post Office Box 270
South Annex Building, Room #10

Attention: District Systems Engineer

March 28, 1980

re: Corrected copy of aff. of 3/21/80
Adding measurements

cc: Conn. Yankee Atomic Pwr. Co.
c/o J. Sevigny
Injun Hollow Road
Haddam Neck, CT 06438

Gentlemen:

The Kerite cable listed below was tested and inspected with the following results and was found to conform to the order.

Order No. 702175
Specification: 970K
Item No. 2

Factory Order No. D-332
Factory Item No. 2A
Conn. Yankee Station

3 Conductor #12 AWG Strand 1KV 50 Mils HT Kerite, 50 Mils FR Jacket
(printed) Cabled and 65 Mils FR Jacket.

PRELIMINARY TEST

The tests are made after the insulated conductors are immersed in water for at least twenty four (24) hours.

Voltage test 60 cycle AC, five (5) minutes ----- 6.0 KV
Voltage test DC, five (5) minutes ----- 18.0 KV

Insulation resistance exceeds our guaranteed value of 6710
megohm-1000 feet at 60°F.

FINAL TEST AND INSPECTION

Reel No.	Length in feet	Continuity Resistance at 68°F	
		Max. ohms/1000 ft	Min.
L-3948	1002	1.592	1.582
L-3949	1027	1.592	1.592
L-3950	1002	1.601	1.592
L-3951	1002	1.601	1.582
L-3952	1002	1.592	1.592
L-3953	1010	1.589	1.579
L-3954	1002	1.592	1.562
L-3955	1024	1.596	1.587
L-395	1002	1.592	1.582
L-3957	1017	1.588	1.588
L-3958	1023	1.608	1.588
L-3959	1047	1.600	1.590
L-3964	1002	1.641	1.621
L-3965	1002	1.631	1.601

14,164

a subsidiary of HARVEY HUBBELL INCORPORATED

HUBBELL

(Continued)

March 28, 1980

page 2
D332-2A

Voltage test on shipping reel - 60 cycle AC, one (1) minute

to ground ----- 10.0 KV
between conductors ----- 20.0 KV

MEASUREMENTS

<u>Reel No.</u>	<u>Jacket Thickness</u>		<u>Outside Diameter</u>	
	<u>Min.</u>	<u>Max.</u>	<u>Top</u>	<u>Pocket</u>
L-3948	.085	.112	.845	.830
L-3949	.085	.110	.840	.850
L-3950	.088	.110	.840	.860
L-3951	.085	.110	.830	.850
L-3952	.080	.108	.835	.840
L-3953	.075	.105	.840	.830
L-3954	.082	.100	.850	.850
L-3955	.083	.096	.835	.840
L-3956	.085	.098	.835	.840
L-3957	.088	.102	.840	.850
L-3958	.087	.102	.840	.840
L-3959	.089	.115	.830	.855
L-3964	.080	.100	.850	.850
L-3965	.087	.108	.850	.860

Shield Continuity Test ----- No Shield

The Inspection of each end of each cable length fails to indicate presence of water.

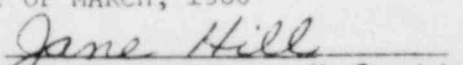
Certified by

THE KERITE COMPANY


JAMES K. RICHARDS
QUALITY ASSURANCE MANAGER

JKR/m

SWORN TO AND SUBSCRIBED TO BEFORE ME THIS 31 DAY OF MARCH, 1980


JANE HILL
My Commission



the kerite company

49 Day Street
Seymour, Connecticut 06483
(203) 888-2591

Northeast Utilities Company
Post Office Box 270
South Annex Building, Room #10
Hartford, Connecticut 06101
Attention: District Systems Engineer

March 28, 1980

re: Corrected copy of aff. of 3/21/80
Adding measurements

cc: Conn. Yankee Atomic Ewr. Co.
c/o J. Sevigny
Injun Hollow Road
Haddam Neck, Ct 06438

Gentlemen:

The Kerite cable listed below was tested and inspected with the following results and was found to conform to the order.

Order No. 702175
Specification: 970K
Item No. 3

Factory Order No. D-332
Factory Item No. 3A
Conn. Yankee Station

7 Conductor #12 AWG Strand 1KV 50 Mil FR Insulation (printed) Cabled
and 65 Mils FR Jacket.

PRELIMINARY TEST

The tests are made after the insulated conductors are immersed in water for at least twenty four (24) hours.

Voltage test 60 cycle AC, five (5) minutes ----- 6.0 KV
Voltage test DC, five (5) minutes ----- 18.0 KV

Insulation resistance exceeds our guaranteed value of 67.10 megohm-1000 feet at 60°F.

FINAL TEST AND INSPECTION

Reel No.	Length in feet	Continuity Resistance at 68°F	
		Max. ohms/1000 ft	Min.
L-3969	1002	1.651	1.641
L-3997	1002	1.631	1.611
L-3998	1002	1.631	1.611
L-3999	1002	1.611	1.611
L-4000	1002	1.631	1.631
L-4196	1002	1.651	1.611
L-4197	1044	1.642	1.623
L-4198	1002	1.661	1.631
L-4199	1002	1.641	1.621
L-4245	1002	1.641	1.631
L-4246	1033	1.641	1.621
	11,095		

(Continued)

a subsidiary of HARVEY HUBBELL INCORPORATED

HUBBELL

March 28, 1980

page 2
D332-3A

Voltage test on shipping reel - 60 cycle AC, one (1) minute

to ground ----- 6.0 KV
between conductors ----- 12.0 KV

MEASUREMENTS

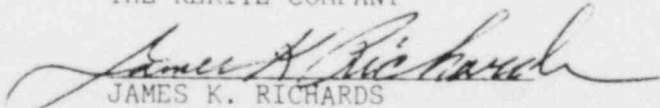
<u>Reel No.</u>	<u>Jacket Thickness</u>		<u>Outside Diameter</u>	
	<u>Min.</u>	<u>Max.</u>	<u>Top</u>	<u>Pocket</u>
L-3969	.052	.058	.750	.750
L-3997	.082	.102	.765	.765
L-3998	.080	.095	.765	.765
L-3999	.077	.102	.755	.750
L-4000	.073	.100	.750	.750
L-4196	.083	.106	.760	.760
L-4197	.084	.102	.755	.760
L-4198	.086	.101	.760	.765
L-4199	.080	.098	.760	.760
L-4245	.078	.098	.765	.765
L-4246	.080	.098	.765	.760

Shield Continuity Test ----- No Shield

The inspection of each end of each cable length fails to indicate presence of water.

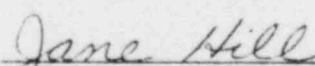
Certified by

THE KERITE COMPANY


JAMES K. RICHARDS
QUALITY ASSURANCE MANAGER

JKR/m

SWORN TO AND SUBSCRIBED TO BEFORE ME THIS 21 DAY OF MARCH, 1980


NOTARY PUBLIC My Commission

MADE BY MGP FEB 25 1980
 NOTED 122 1980 P.J.F.

BRAND - REX COMPANY

CERTIFIED TEST DATA # 80233-3-1 NOTED FEB 22 1980 R.L.

To: Northeast Utilities Service Co.
 P. O. Box 270
 Hartford, CT 06101

Date: February 4, 1980
 Order No: 700130
 B/R Order No: 80233-03
 Mark: 13600026
 B/R Part No: T-7546

<u>CHARACTERISTIC</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
Conductor		
Type	#16 AWG Tin Copper	#16 AWG T.C.
No. of Strands	19	19
Strand O.D.	.0117" Nom.	.0117"
Conductor	.059: Nom.	.0565"
Insulation		
Type	XLPE	XLPE
Diameter	.121" Nom.	.122"
Wall Thickness	.030" Avg. .027" Min.	.034" .030"
Tensile Strength	1800 PSI Min.	2286 PSI
Elongation	150% Min.	400%
Aged 168 Hrs. @ 121°C		
Tensile Retention	85% Min.	93.7%
Elongation Retention	60% Min.	94%
Heat Distortion @ 121°C	30% Max.	12.5%
Vertical Flame	1 Minute Max. Burn	Pass
Color Code	IPCEA S-19-81 Section 5.6.3.1.1	Conforms
Cabling		
No. of Components	3	3
Filler	Non-Wicking Flame Retard	Conforms
Lay Length	3.75" L. H. Lay Nom.	3.75"
Drain Wire	#18 AWG, 7 Strand T.C.	Conforms
Shield	Aluminum/Mylar Tape	Conforms
Shield Overlap	25% Nom.	25%
Jacket		
Type	H. D. Neoprene	H. D. Neoprene
Color	Black	Black
Diameter	.360" Nom.	.385"
Wall Thickness	.045" Avg. .036" Min.	.067" .056"
Tensile Strength	1800 PSI Min.	2126 PSI
Elongation	300% Min.	475%
Tensile Stress @ 200%	500 PSI Min.	1194 PSI
Tension Set	20% Max.	9%
Aged 168 Hrs. @ 100°C		
Tensile Retention	50% Min.	93.5%
Elongation Retention	50% Min.	65.2%
Oil Immersion, 18 Hrs. @ 121°C		
Tensile Retention	60% Min.	98.7%
Elongation Retention	60% Min.	73.6%

Jacket (Continued)

Jacket Identification	Brand-Rex XLP Black Shielded Instrument Cable 3/C 16 AWG. CU 600V Month/Year Unique Serial No.	Conforms
Dielectric Strength		
Conductor to Conductor	4000 V AC 5 Min.	Pass
Conductor to Shield	4000 V AC 5 Min.	Pass
Conductor Continuity	No Opens @ 9 V DC	Pass
Shield Continuity	No Opens @ 9 V DC	Pass
Insulation Resistance @ 15.6°C	3119 Megohm - 1000 Ft. Min.	82,661 Megohms
Conductor Resistance @ 20°C	4.58 Ohms/1000'	4.25 Ohms
Absence of Water	No visible moisture in cable	Pass

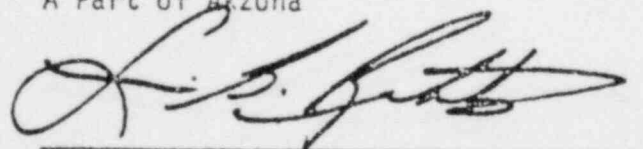
SHIPMENT DATA

Total Quantity	7654	Feet
Total Reels	2	Reels

Reel # 25594 - 5000'
23282 - 2654'

This is to certify that the aforementioned material was manufactured to, tested to, and accepted in accordance with the applicable specification.

BRAND-REX COMPANY
A Part of Akzona



L. B. Roberts
Manager, Quality Assurance

ATTACHMENT 5

HADDAM NECK PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

REFERENCES

JULY, 1980

LIST OF REFERENCES

FOR "SYSTEM COMPONENT EVALUATION WORK SHEETS"

- (1) Letter of March 6, 1978 from D. C. Switzer (CYAPCO) to V. Stello, Jr., (NRC), plus Supplement #1 of July, 1978.
- (2) Haddam Neck Plant, "Facility Description and Safety Analysis".
- (3) Crane R&D Laboratory Report E.L. 7828-1, S.O. 952075 dated October 20, 1969.
- (4) Letter of December 29, 1978 from W. G. Counsil (CYAPCO) to D. L. Ziemann (NRC), "Attachment - Haddam Neck Plant, Systematic Evaluation Program, Electrical Equipment Environmental Qualification", dated December, 1978.
- (5) NUSCO Evaluation (GEE-78-387) dated July 28, 1978.
- (6) NUSCO Evaluation (GEE-78-396) dated July 28, 1978.
- (7) Crane Company letter of February 1, 1978.
- (8) Crane Company letter of February 2, 1978.
- (9) NUSCO Evaluation (GEE-78-382) dated July 21, 1978.
- (10) NUSCO Evaluation (GEE-78-384) dated July 20, 1978.
- (11) NUSCO Evaluation (GEE-79-449) dated July 30, 1979.
- (12) NUSCO Evaluation (GEE-79-10) dated January 4, 1979.
- (13) NUSCO Evaluation (GEE-78-383) dated July 20, 1978.
- (14) Franklin Institute Report F-C2232-01 of November, 1968.
- (15) Limitorque Letter of January 31, 1978.
- (16) Limitorque Test Report #600198 dated January 2, 1969.
- (17) Franklin Institute Report F-C3441 dated September, 1972.
- (18) NUSCO Evaluation (GEE-78-411) dated August 3, 1978.
- (19) Westinghouse Electric letter CY-W-78-518 dated April 5, 1978.
- (20) NUSCO Evaluation (GEE-78-388) dated July 28, 1978.
- (21) Stone and Webster - Report No. 4 dated September 6, 1978.
- (22) Amendment 47 to San Onofre FSAR - Pages 6A-32, 33, and 6B-17, 18, and 19.

- (23) NUSCO Evaluation (GEE-79-29) dated January 11, 1979.
- (24) NUSCO Evaluation (GEE-79-340) dated May 31, 1979.
- (25) CYAPCO - Plant Design Change Request No. 270 dated January 28, 1978.
- (26) CYAPCO letter of February 2, 1978, D. C. Switzer to A. Schwencer (NRC).
- (27) CYAPCO letter of February 10, 1978, D. C. Switzer to A. Schwencer (NRC).
- (28) NUSCO Evaluation (GEE-78-127) dated March 27, 1978.
- (29) CYAPCO Letter of March 29, 1978, D. C. Switzer to D. L. Ziemann (NRC).
- (30) NUSCO Evaluation (GEE-79-150) dated March 9, 1979. (NO LONGER APPLICABLE)

MISSING FROM PACKAGE