

**EXHIBIT 1
COVER SHEET**

 PSEG Nuclear Department CALCULATION COVER SHEET	TITLE QUALIFIED LIFE CALL FOR NUTHERM FRYS VENT HEATER CONTROL PANEL COMPONENTS		COVER SHEET 1 OF 15
	ID NUMBER NUTHERM-ARRH-003	REFERENCE EQM-042	
CALCULATION REVISION	1	2	3
CP NUMBER	—	—	—
REVISION HISTORY (INTERIM or FINAL) INTERIM = Proposed Plant Change FINAL = Supports Instal- led Condition	DUE TO MAJOR REVISION NO REVISION BARS ARE USED.	REVISED PAGES 11, 13 & 14 TO TAKE CREDIT FOR MUFFIN FAN MOTOR ACCIDENT TESTING.	REVISED PAGE 3 TO DELETE NOTE FOR 1B-C-045, BECAUSE MUFFIN FAN IS INSTALLED UNDER DCP AEC-3254 FIG 2 IN THE PANEL.
FUTURE CONFIRMATION REQUIRED: =====	NO	NO	NO
ORIGINATOR (Initial & Date)	<i>AJ Ahuta</i> 3/27/92	<i>AJ Ahuta</i> 6/11/92	<i>AJ Ahuta</i> 2/2/93
REVIEWER (Initial & Date)	<i>A.P. Languly</i> 3/27/92	<i>A.P. Languly</i> 6/16/92	<i>A.P. Languly</i> 2/2/93
Public Service SUPERVISOR APPROVAL (Initial & Date)	<i>B. Allen</i> 3/27/92	<i>B. Allen</i> 6/16/92	<i>B. Allen</i> 2/4/93
COVER SHEET (Number Pages)	1	1	1
CALCULATIONS (Number Pages) (Excluding Attachments)	14	14	14
ATTACHMENTS (Number/Total Pages)	40	40	40
TOTAL PAGES	55	55	55
IMPORTANT TO SAFETY ☒ YES ☐ NO			
If yes, design verification required per DE-AP.22-0010(Q) (Design Verification, Ref. 8.3)			



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRVS VENT HEATER
CONTROL PNL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

2
OF
15

ORIGINATOR	4/	1
DATE	3/27/92	
PEER REVIEW	PPG	
DATE	3/27/92	

TABLE OF CONTENTS

	<u>Page No</u>
TABLE OF CONTENTS	2
OBJECTIVE	2
SCOPE	2
DESIGN INPUT	3
ASSUMPTIONS	4
CALCULATION	5
CONCLUSION	13
REFERENCES	14
ATTACHMENTS	
1) DCP 4EX-3133 test temperatures	
2) DCP 4FC-3254 test temperatures	
3) Letter from D. Fisher to W. O'Malley, 7/11/91	
4) To date Surveillance and Aging time	
5) Component test level summary	

1.0 OBJECTIVE

The objective of this calculation is to determine the level of Qualification for the existing Hope Creek FRVS Vent panel with muffin fan cooling modification implemented under DCP 4EC-3254 pkg. 1, demonstrated by NUTHERM report N-160-00R, Rev.4 (Reference 2), Bussmann report 47C-3 (Reference 5), AMP report 110-11004, Rev 0 (Reference 8), Rockwell Report no. 280QR000001 (Reference 9), Rockbestos Report no. 5805 (Reference 12) and Supplemental NUTHERM testing provided in NUTHERM report N-160-00RA1 Rev. 0 (Reference 11).

2.0 SCOPE

This calculation applies to the following Hope Creek control panels.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PANEL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQM-042

SHEET

3
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

AF
3/27/92
APG
3/27/92

AF
2/2/93
APG
2/2/93

1

3

Room No

FRVS Vent Control
Panels

1A-C-045
1B-C-045

4511
4512

03

3.0 DESIGN INPUT

- 1.0 Component temperatures measured during test DCP 4EX-3133, and Design Change DCP 4EC-3254 will be used to determine the heat rise values of the control panel components. See Attachment 1 and 2 for test data.

The measured heat rise values are used to calculate the postulated control panel component temperatures during accident condition in a closed door with two muffin fans for cooling configuration by adding the heat rise value to the base-line accident ambient.

- 2.0 Normal Design Room Ambient = 95°F (Ref 1)
Postulated Accident Room Ambient = 148°F "
Post Accident Operability Period = 110 Days "

- 3.0 Estimated amount of Surveillance time of original panel components to date in the closed door condition is 267 Hours. (See Attachment 6, calculation uses 294 hours to account for decay heat.)

Estimated amount of Surveillance time of replaced components (ie., fuses and contactors) is 35 Hours. (See Attachment 6.)

- 4.0 Estimated amount of Normal Aging time of original panel components to date is 47,106 Hours. (See Attachment 6.)



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
PRVS VENT HEATER
CONTROL PNL COMPONENTS

ORIGINATOR
DATE
PEER REVIEW
DATE

11
3/27/92
FAC.
3/29/92

1

ID NO. NUTHERM-ARRM-003

REFERENCE EQH-042

SHEET

4
OF
15

5.0 Activation energy values

	NUTHERM PART NO	ACTIVATION ENERGY, eV	REFERENCE
FUSE	KTS-R60	1.3	Reference 5
FUSE HOLDER	20	1.2	Reference 2
CONTACTOR	68	1.29	Reference 11
TRANSFORMER	51	1.03	Reference 11
WIRE TERMINAL	559	1.27	Reference 8
WIRE (14GA)	L114-1	1.1	Reference 11
TERMINAL BLOCK	111	1.2	Reference 2
TERMINAL BLOCK	217	1.2	Reference 2
T/C WIRE	581	1.3	Reference 2
TERMINAL BLOCK	65	1.2	Reference 2
FUSE BLOCK	L1513-1	1.2	Reference 2
MUFFIN FAN		1.0	Reference 9
DISCONNECT SWITCH	435	1.0	Reference 2
ROCKBESTOS CABLE		1.34	Reference 12

6.0 The additional test data provided by NUTHERM in Reference 11 is used in determining the level of qualification of certain control panel components (as indicated on page 6). This additional test data was obtained by NUTHERM and was determined to be applicable to Hope Creek design.

7.0 No margin in temperature is required to calculate component PAOP times because the components are not subjected to accident transient (LOCA) or steam environment in accordance with IEEE 323 - 1974.

4.0 ASSUMPTIONS

- 1) The temperature rise data measured is representative of the Vent control panel components.
- 2) Aging mechanism of components is controlled by one chemical reaction over a given temperature range.
- 3) In order to account for decay heat of the components during the surveillance tests, a margin of 10% in operating time will be used.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRVS VENT HEATER
CONTROL PNL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

5
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

AT
3/27/92
KFE.
3/27/92

1

4) A heat rise of 5°F is assumed for all non stand-by components in the closed door surveillance evaluation.

5.0 CALCULATION

The safety related, age sensitive FRVS Vent heater control panel components (reference 3) are listed below.

This table also includes component test data based on the vendor qualification reports. These numbers were calculated using the Arrhenius methodology (outlined below) that reconciled component test(s) to the appropriate service conditions (from references 2,5,8,9 and 11) in order to establish an equivalent test level.

$$t_1 = t_2 * \exp((Ae/B)*(1/T_1 - 1/T_2))$$

where: t_1 = Service time
 t_2 = Accelerated aging time
 Ae = Activation Energy, eV
 B = $0.8617e-04$ eV/°K
 T_1 = Service temperature, °K
 T_2 = Aging temperature, °K

As an example, Reference 5 indicates that the Bussman fuse was tested to the following levels.

- 1) 169°C (442°K) for 15 hours
- 2) 100°C (373°K) for 104 hours

total equivalent test time at 373°K, is therefore calculated for an activation energy of 1.3 as....

$$104 \text{ hours} + 15 \text{ hr} * \exp((1.3/B)*(1/373 - 1/442)) \\ = 8387.82 \text{ Hours}$$



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PNL COMPONENTS

ORIGINATOR
DATE
PEER REVIEW
DATE

48
3/27/92
A.T.E.
3/27/92

ID NO NUTHERM-ARRH-C03

REFERENCE EQH-042

SHEET

6

OF

15

COMPONENT	NUTHERM Part No	DCP 4EX-3133 TEST TEMPERATURES		EQUIVALENT QUAL TEST DATA
		W/O DOOR	WITH DOOR	
Fuse	KTS-R60 ¹	185°F	220°F	8387 Hr @ 373°K (Ref 5)
Fuse Holder	20	121°F	156°F	1,139.15 Hr @ 384.827°K (Ref 11)
Contactor	68	185°F	220°F	5,037.71Hr @ 385.938°K (Ref 11)
Transformer	51	121°F	156°F	3,790.29Hr @ 385.938°K (Ref 11)
Wire Terminal	559	185°F	220°F	504 Hr @ 438°K (Ref 8)
Wire (14G)	SRGS600	185°F	220°F	188.99 Hr @ 472.049°K (Ref 11)
Terminal Block	111	131°F ²	190°F ²	1,082 Hr @ 385°K (Ref 2)
Terminal Block	217	131°F ²	190°F ²	983.5 Hr @ 385°K (Ref 2)
T/C Wire	581	131°F ²	190°F ²	305.5 Hr @ 385°K (Ref 2)
Terminal Block	65	131°F ²	190°F ²	1,929.16 Hr @ 385.938°K (Ref 11)
Fuse Block	L1513-1	168°F	212°F	1,917.30 Hr @ 385.938°K (Ref 11)

1) Replacement Bussmann fuse

2) A 10°F margin was added to corresponding temp levels.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
PRVS VENT HEATER
CONTROL PNL COMPONENTS

ORIGINATOR 43 1
DATE 3/27/92
PEER REVIEW F.P.C.
DATE 3/29/92

ID NO. NUTHERM-ARRH-003

REFERENCE EQM-042

SHEET

7
OF

15

COMPONENT	NUTHERM Part No	DCP 4EC-3254 TEST TEMPERATURES		EQUIVALENT QUAL TEST DATA
		WITH 1 FAN	WITH 2 FAN	
Fuse	KTS-R60 ¹	167.1°F	123.2°F	8387 Hr @ 373°K (Ref 5)
Fuse Holder	20	152.6°F	122.2°F	1139.15 Hr @ 384.827°K (Ref 11)
Contactor	68	153.9°F	110.4°F	5037.71 Hr @ 385.938°K (Ref 11)
Transformer	51	114.7°F	110.7°F	3790.29 Hr @ 385.938°K (Ref 11)
Wire Terminal	559	107.1°F	97.8°F	504 Hr @ 438°K (Ref 8)
Wire	SRGS600	107.1°F	97.8°F	188.99 Hr @ 472.049°K (Ref 11)
Terminal Block	111	106°F	105°F	1082 Hr @ 385°K (Ref 2)
Terminal Block	217	106°F	105°F	983.5 Hr @ 385°K (Ref 2)
T/C Wire	581	106°F	105°F	305.5 Hr @ 385°K (Ref 2)
Terminal Block	65	106°F	105°F	1929.16 Hr @ 385.938°K (Ref 11)
Fuse Block	L1513-1	106°F	105°F	1917.30 Hr @ 385.938°K (Ref 11)
Disconnect Switch	435	100°F	93.8°F	555.22 Hr @ 385°K (Ref 2)
Muffin Fan	N/A	102°F	103°F	228 Hr @ 373.5°K (Ref 9)
Rockbestos Cable	N/A	179.7°F	124.2°F	168 Hr @ 394°K (Ref 12)



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PNL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

8
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

AB
3/27/92
J.P.
3/27/92

1

Normal Aging To-Date

The following table summarizes results of the normal aging evaluation of the panel components. It calculates the amount of test time required to envelope the estimated 47,106 hours of to-date normal aging at the indicated test temperature. For the fuse & contactor the estimated hours is 1440.

COMPONENT	NUTHERM Part No	POSTULATED TEMP DURING NORMAL AGING (DOORS ON) °F (°K)	AGING TEMP, (°K)	EQUIVALENT TEST TIME REQUIRED TO ENVELOPE NORMAL AGING TO DATE, HRS
FUSE	KTS-R60	100(310.77)	373	0.44
FUSE HOLDER	20	115(319.11)	384.83	27.32
CONTACTOR	68	120(321.88)	385.94	0.64
TRANSFORMER	51	115(319.11)	385.94	71.81
WIRE	559	100(310.77)	438	0.049
TERMINAL				
WIRE (14GA)	L114-1	100(310.77)	472.05	0.038
TERMINAL BLK	111	100(310.77)	385	8.33
TERMINAL BLK	217	100(310.77)	385	8.33
T/C WIRE	581	100(310.77)	385	4.06
TERMINAL BLK	65	100(310.77)	385.94	7.63
FUSE BLOCK	L1513-1	100(310.77)	385.94	7.63
DISCONNECT				
SWITCH	435	---	385	N/A
MUFFIN FAN	N/A	---	373.5	N/A
ROCKBESTOS	N/A	---	394	N/A
CABLE				

Disconnect Switch, Muffin Fan and Rockbestos cable were installed as a part of DCP-3254, Therefore past degradation is not considered for these components.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PNL COMPONENTS

ORIGINATOR AS 1
DATE 3/27/92
PEER REVIEW P.T.G.
DATE 3/29/92

ID NO. NUTHERM-ARRM-003

REFERENCE EQM-042

SHEET

9
OF
15

Surveillance To-Date

The following table summarizes results of the surveillance evaluation of the panel components. It calculates the amount of test time required to envelope the to-date surveillance tests at the indicated component test temperature.

COMPONENT	NUTHERM Part No	TO-DATE SURVEILLANCE TEMPERATURE (DOORS ON, 95°F AMB) °F (°K)	AGING TEMP, (°K)	EQUIVALENT TEST TIME REQUIRED TO ENVELOPE SURVEILLANCE TO DATE, HRS
FUSE	KTS-R60	220 (377.44)	373	56.32
FUSE HOLDER	20	156 (341.88)	384.83	3.12
CONTACTOR	68	220 (377.44)	385.94	14.61
TRANSFORMER	51	156 (341.88)	385.94	5.43
WIRE				
TERMINAL	559	220 (377.44)	438	1.33
WIRE (14 GA)	L114-1	220 (377.44)	472.05	0.33
TERMINAL BLK	111	190 (360.77)	385	25.90
TERMINAL BLK	217	190 (360.77)	385	25.90
T/C WIRE	581	190 (360.77)	385	21.15
TERMINAL BLK	65	190 (360.77)	385.94	23.72
FUSE BLOCK	L1513-1	212 (373)	385.94	84.10
DISCONNECT				
SWITCH	435	---	385	N/A
MUFFIN FAN	N/A	---	373.5	N/A
ROCKBESTOS				
CABLE	N/A	---	394	N/A

Disconnect Switch, Muffin Fan and Rockbestos Cable were installed as a part of DCP-3254, Therefore past surveillance degradation is not considered for these components.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
PRVS YENT HEATER
CONTROL PNL COMPONENTS

ORIGINATOR AB 1
DATE 3/27/92
PEER REVIEW A.T.C.
DATE 3/27/92

ID NO. NUTHERM-ARRH-C03

REFERENCE EQH-042

SHEET

10
OF
15

Surveillance with Muffin Fan

The following table summarizes results of the surveillance evaluation of the panel components. It calculates the amount of test time required to envelope the surveillance test with muffin fans installed at the indicated temperature. For conservatism the temperature with 1 fan is considered for the entire 10 hours of the surveillance test.

COMPONENT	NUTHERM Part No	SURVEILLANCE TEMPERATURE WITH 1 FAN RUNNING °F (°K)	AGING TEMP, (°K)	EQUIVALENT TEST TIME REQUIRED TO ENVELOPE SURVEILLANCE TO DATE, HRS
FUSE	KTS-R60	167.1 (348.05)	373	0.55
FUSE HOLDER	20	152.6 (340)	384.83	0.08
CONTACTOR	68	153.9 (340.72)	385.94	0.06
TRANSFORMER	51	114.7 (318.94)	385.94	0.01
WIRE				
TERMINAL	559	107.1 (314.72)	438	0.00002
WIRE (14 GA)	L114-1	107.1 (314.72)	472.05	0.00001
TERMINAL BLK	111	101 (311.33)	385	0.002
TERMINAL BLK	217	101 (311.33)	385	0.002
T/C WIRE	581	101 (311.33)	385	0.0009
TERMINAL BLK	65	101 (311.33)	385.94	0.002
FUSE BLOCK	L1513-1	101 (311.33)	385.94	0.002
DISCONNECT				
SWITCH	435	100 (310.77)	385	0.007
MUFFIN FAN	N/A	102 (311.89)	373.50	0.0216
ROCKBESTOS				
CABLE	N/A	179.7 (355.05)	394	0.13



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PNL COMPONENTS

ID NO NUTHERM-ARRM-C03

REFERENCE EQM-C42

SHEET

11
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

42
3/25/92
STG
3/27/92

1

42
6/11/92
STG
6/16/92

2

Accident Evaluation

The following table summarizes results of the accident evaluation of the panel components. It calculates the amount of test time required to envelope the specified 110 day Post Accident Operability Period at the indicated test temperature.

COMPONENT	NUTHERM Part No	POSTULATED TEMP DURING ACCIDENT °F (°K)	AGING TEMP, (°K)	EQUIVALENT TEST TIME REQUIRED TO ENVELOPE ACCIDENT, HRS
FUSE	KTS-R60	227.1(381.38)	373	6420.51
FUSE HOLDER	20	212.6(373.33)	384.83	866.19
CONTACTOR	68	213.9(374.05)	385.94	769.49
TRANSFORMER	51	174.7(352.27)	385.94	136.79
WIRE				
TERMINAL	559	167.1(348.05)	438	0.44
WIRE (14GA)	L114-1	167.1(348.05)	472.05	0.17
TERMINAL BLK	111	161(344.66)	385	38.28
TERMINAL BLK	217	161(344.66)	385	38.28
T/C WIRE	581	161(344.66)	385	26.90
TERMINAL BLK	65	161(344.66)	385.94	35.06
FUSE BLOCK	L1513-1	161(344.66)	385.94	35.06
DISCONNECT				
SWITCH	435	160(344.11)	385	73.46
MUFFIN FAN	N/A	162(345.22)	373.50	N/A
ROCKBESTOS				
CABLE	N/A	239.7(388.38)	394	N/A

Rockbestos cable and Muffin Fan are not analyzed for accident evaluation since it is qualified for separate DBA test which envelopes required accident condition, therefore evaluation for accident is not required.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS YENT HEATER
CONTROL PNL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

12
OF
15

ORIGINATOR AL
DATE 3/27/92
PEER REVIEW FHE
DATE 3/27/92

Available Life Evaluation

Since the Surveillance demands of the panels require that the panels are energized for 10 hour every 31 days, the remaining life of the components will be calculated on a monthly basis considering the temperature obtained during the surveillance test with muffin fans installed with 1 muffin fan running for conservatism.

The amount of life that will be used up during the 10 hour surveillance testing and monthly normal aging is summarized below.

COMPONENT	NUTHERM Part No	SURV TEMP (°F)	NORMAL AGING TEMP (°F)	EQUIV TEST TIME FOR 11 HRS SURVEILL- ANCE AND COOLDOWN, HRS	EQUIV TEST TIME FOR 31 DAYS OF NORMAL AGING, HRS
FUSE	KTS-R60	167.1	105	0.6056	0.3425
FUSE HOLDER	20	152.6	110	0.0932	0.2897
CONTACTOR	68	153.9	115	0.0639	0.2174
TRANSFORMER	51	114.7	110	0.0164	0.8040
WIRE					
TERMINAL	559	107.1	100	0.00002	0.00076
WIRE (14GA)	L114-1	107.1	100	0.00001	0.00059
TERMINAL BLK	111	101	95	0.002	0.08667
TERMINAL BLK	217	101	95	0.002	0.08667
T/C WIRE	581	101	95	0.001	0.0408
TERMINAL BLK	65	101	95	0.0019	0.07937
FUSE BLOCK	L1513-1	101	95	0.0019	0.07937
DISCONNECT					
SWITCH	435	100	95	0.0082	0.3912
MUFFIN FAN	N/A	102	100	0.02477	1.4434
ROCKBESTOS					
CABLE	N/A	179.7	115	0.1419	0.06655

The surveillance procedure is revised in July 1991 and the panel will not be energized for the entire 10 hours, However in the calculation it is assumed that panel will be energized for the entire duration for conservatism.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRYS VENT HEATER
CONTROL PNL COMPONENTS

ID NO. NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

13
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

AS
3/27/92
PTF
3/27/92

1

PT
6/11/92
PTF
6/16/92

2

The following table summarizes these calculations to determine the remaining available life.

COMPONENT	NUTHERM Part No	REMAINING TEST TIME AFTER AGING SURVEILLANCE & ACCIDENT HRS	MONTHLY TEST TIME USED FROM AGING AND SURVEILLANCE HRS	LIFE REMAIN- ING YEARS
FUSE	KTS-R60	1909.18	0.9481	>>47
FUSE HOLDER	20	242.44	0.3829	52.75
CONTACTOR	68	4252.91	0.2813	>>40
TRANSFORMER	51	3576.25	0.8204	>>40
WIRE				
TERMINAL	559	502.18	0.00078	>>40
WIRE (14GA)	L114-1	188.45	0.0006	>>40
TERMINAL BLK	111	1009.48	0.8867	>>40
TERMINAL BLK	217	910.98	0.8867	>>40
T/C WIRE	581	253.38	0.0418	>>40
TERMINAL BLK	65	1862.74	0.08127	>>40
FUSE BLOCK	L1513-1	1790.50	0.08127	>>40
DISCONNECT				
SWITCH	435	481.75	0.3994	>>40
MUFFIN FAN	N/A	228.00	1.4640	10.00
ROCKBESTOS				
CABLE	N/A	167.87	0.20845	67.00

The capacitor board for the Muffin fan is not analyzed in this calculation because the electronic components does not follow Arrhenius relationship, they follow the bathtub curve and should be replaced every 10 years. Also the life of the muffin fan is based on the bearing life since it is a sealed bearing and the fan have to be replaced at the end of the qualified life of the bearing.



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
FRVS VENT HEATER
CONTROL PANEL COMPONENTS

ID NO. NUTHERM-ARRM-003

REFERENCE EQM-C42

SHEET

14
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

AF
3/27/92
FRG
3/27/92

1

AF
6/11/92
FRG
6/16/92

2

6.0 CONCLUSION

The existing FRVS vent heater control panels with muffin fans installed to provide cooling is qualified for 40 years and 110 days of Post Accident Operability Time with the exception of muffin fan and capacitor board for the muffin fan. Muffin fan and the capacitor board should be replaced every 10 years.

2

7.0 REFERENCES

- 1.0 10855-D7.5, "Environmental Design Criteria for the Hope Creek Generating Station.
- 2.0 NUTHERM International Qualification Report N-160-00R, Rev. 4 dated 5/23/85, "Equipment Environmental Qualification Report for Remote Control Panels & Thermocouples for Hope Creek Nuclear Plant Unit 1 and 2"
- 3.0 Test and Experiment DCP 4EX-3133
- 4.0 IEEE 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations"
- 5.0 Bussmann Report No 470-8, dated June, 1983. "Nuclear Environmental Qualification Test for Class 1E Equipment"
- 6.0 WORK ORDERS for replacement of Fuses
1A-C-045; 910718156
1B-C-045; 910718158
- 7.0 WORK ORDERS for replacement of Contactors
1A-C-045; 910717087
1B-C-045; 910717091



CALCULATION
CONTINUATION SHEET

TITLE QUALIFIED LIFE
CALC FOR NUTHERM
PRV3 YENT HEATER
CONTROL PNL COMPONENTS

ID NO NUTHERM-ARRH-003

REFERENCE EQH-042

SHEET

15
OF
15

ORIGINATOR
DATE
PEER REVIEW
DATE

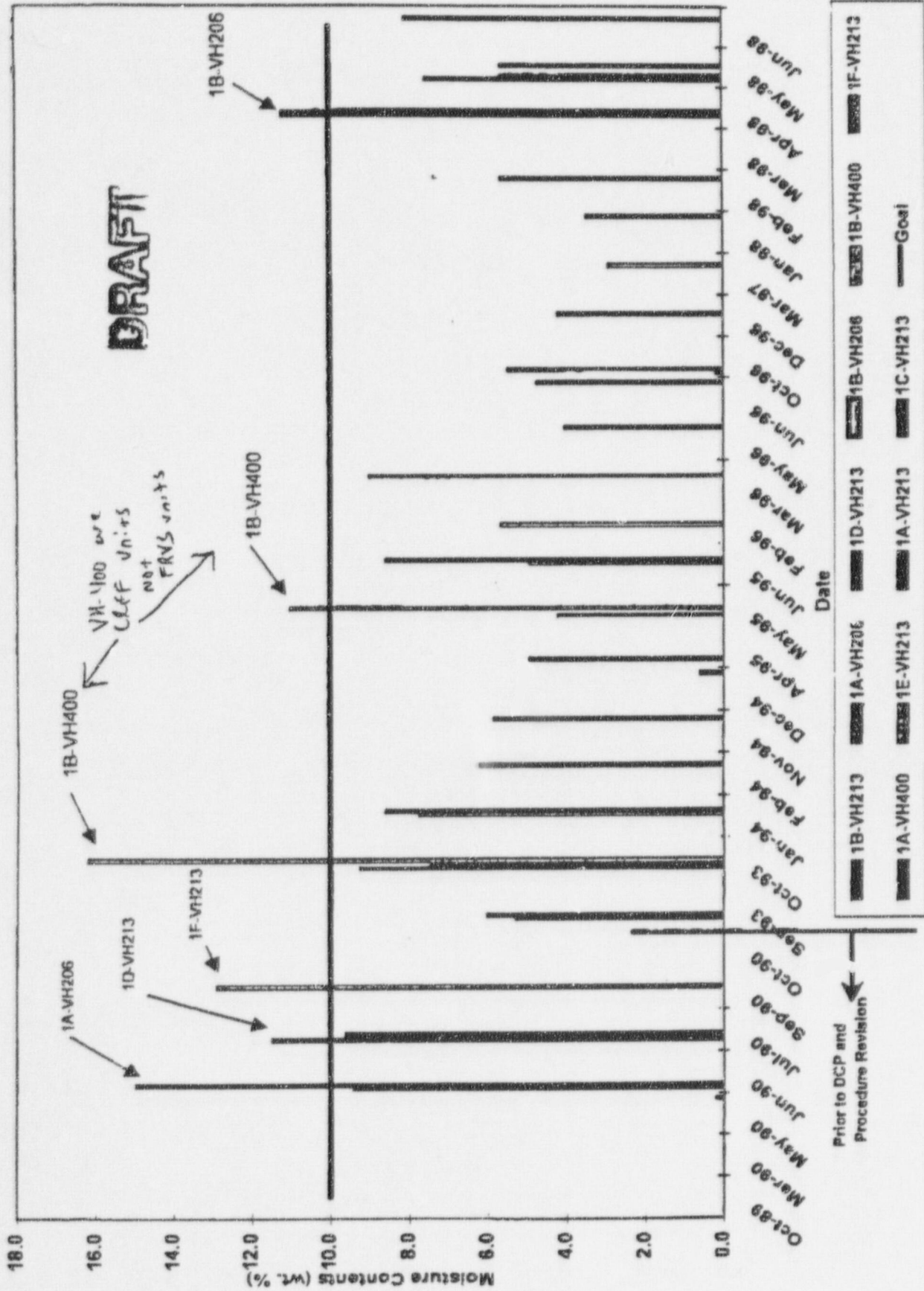
JP
3/27/92
JP
3/27/92

1

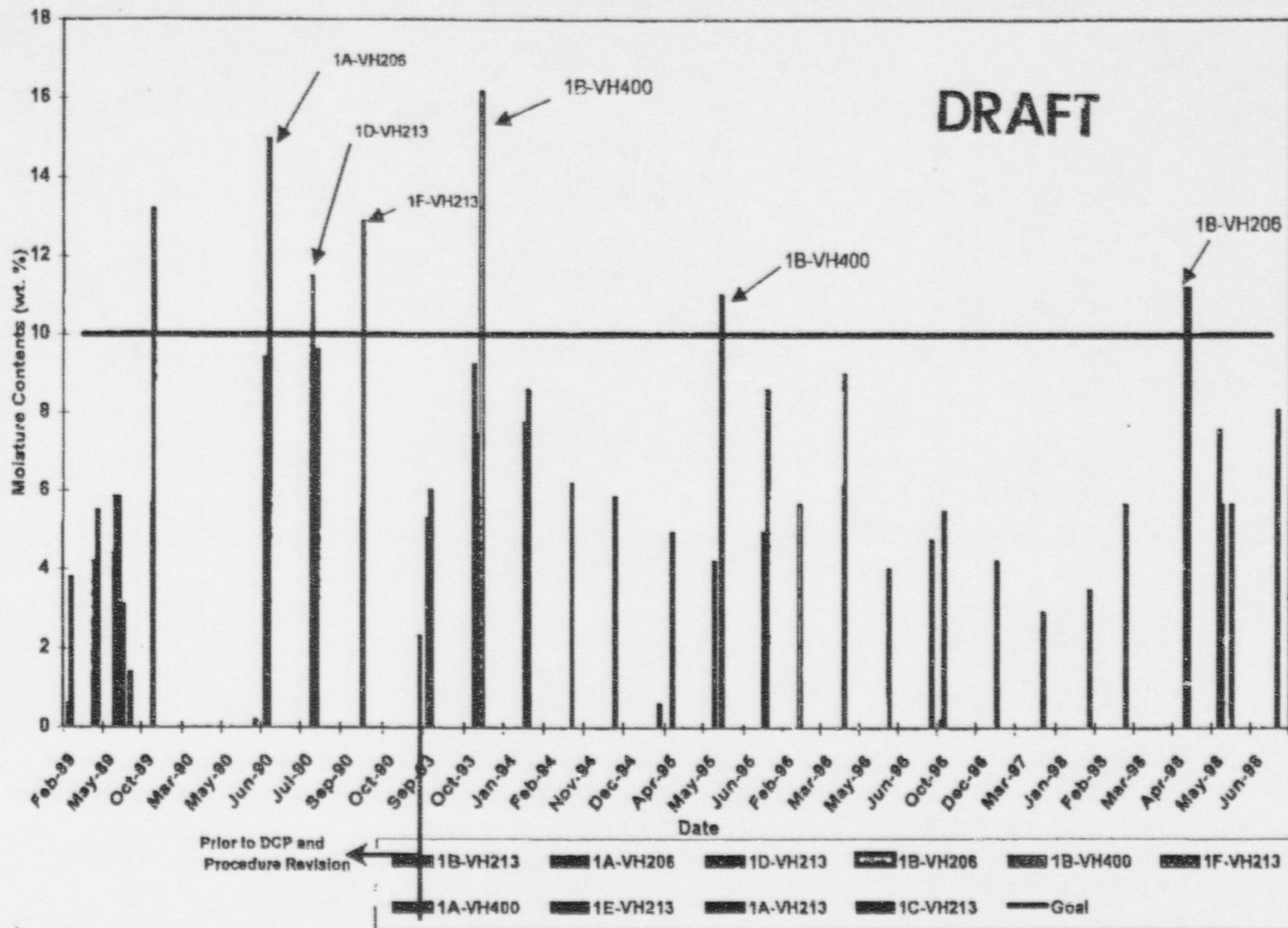
- 8.0 AMP Qualification Test Report 110-11004, Rev 0, dated 2/2/82, "AMP Insulated terminal and splices for Class 1E inside Containment service in Nuclear Power Generating Station"
- 9.0 ROCKWELL Qualification Report No. 280QR000001
- 10.0 DCP 4EC-3254
- 11.0 NUTHERM Qualification Report No. N-160-00RA1 Rev.0
- 12.0 ROCKBESTOS Qualification Report No. 5805

To: Rick Ennis, Hope Creek PM
 From: Jim Prist, PSE+G
 603 339 5434

Charcoal Moisture Contents



Charcoal Moisture Contents



ATTACHMENT 8

Pre mod avg. = 6.7 %

Post mod avg. = 6.34 %