

AUG 7 1984

DMB 016

Docket No. 50-289

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Docket File

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NRC PDR

L PDR

ORB#4 Rdg

EJordan

JNGrace

ACRS-10

JVan Vliet

RIngram

Gray File

Ms. Ellyn R. Weiss
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Dear Ms. Weiss:

Enclosed per your discussions with J. Van Vliet are copies of staff notes from the TMI-1 environmental qualification file audits of March 20-21, May 7-8, 24 and June 25, 1984. In general, the information in these notes was discussed with GPU Nuclear staff during the audits. Copies of some of these notes may also have been provided to GPU Nuclear at the audit exit interviews. Also enclosed are copies of notes from our most recent audit on August 6, 1984. The staff has concluded from this audit that all EFW file deficiencies have been resolved and that the files adequately demonstrated EFW system environmental qualification.

Sincerely,

"ORIGINAL SIGNED BY
JOHN F. STOLZ"

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
As Stated

cc: See next page

ORB#4:DL
JVan Vliet;cf
8/7/84
78

JF
ORB#4:DL
JStolz
8/7/84

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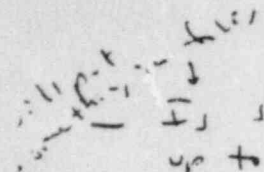
Audit of CPU EQ Files for EFW Equip.

- 1. Limitorque motor operators - TCR items 11 ~~11~~ + 15
~~SMB-0~~ SMB-0 + SMB-000

Similarity
 Motor Manuf.
 Current type
 Qual. Life } FRC comments

- o Comment: - No specified operating time in files
 (or on screw sheet) - why is 16 day test o.k.?
- o ✓ - 8/12/80 ltr. says, B0003 can be applied to
 EF-V-1A + 1B, however the ltr says nothing
 about EF-V-2B + 2A (similarity) → specifically tested
- o ✓ - How was it determined that B0058 is applicable? (similarity)
 Files do not indicate motor manu. or current
type of TMI-1 Limitorques (similarity)
- o ✓ - File does not contain any aging calculations
 (qual. life) - handwritten statement referring to B0058 p. 2 not
 correct
- o ✓ - File does not indicate insulation class of
 motors
- o ✓ - ~~File does not show why B0027 is applicable~~
~~from the report address class, Rtt inst. & relationship~~
- o ✓ - Where is motor lead insulation addressed? (FRC comment)
~~Where is the nut for analysis?~~ (B0004)
- o ✓ - What are QA requirements? Some handwritten pages
 are unsigned, unchecked, unapproved & not dated.
- o ✓ - Why isn't B0003 referenced for aging & qual. life? Can we date
 on p. 7 for calculations.

Will look at file
 Will look at file



- ✓ - B0003 shows MSLB env. if enveloped by test, when considering duration of 322°F spike and B0027 + taken with Limit. Temp. (3/11/84) (to J. Dual of Limit. Temp. from P. Boucher of GPU)
- ✓ - B0058 indicates that test, SM0-0 (or in B0003) qualifies, SM0-000
- ~~How was it determined that B0058 is applicable? (similarity)~~
- ✓ - MSLB profile in EDS Nuclear Report No. 02-0370-1058, Rev. 2, dated 6/81 (see ^{Figure 5.} ~~write-up~~)
- ✓ - B0003 "Qual. Type Test Report, Limit. Valve Actuators, For Class 1E Service, Outside Primary (TMT, In Nuclear Power Station Service", 6/7/76
- ✓ - B0027 "Limit. Valve Actuator Temp. Related to High Superheat Ambient Temp. Rev. A 10/18/78
- ✓ - B0050 "Limit. Valve Actuator Qual. for Nuclear Power Station Service", 1/11/80
- ✓ - B0003 - 120°F - 250°F in 10 sec. 25 p/si
 (Class B motor insul.) hold for 30 min.
 cool to 120°F @ 90°F/hr
 120°F to 250°F in 10 sec. 25 p/si
 hold for 24 hr,
 Cool to 200°F @ 90°F/hr
 Hold 200°F for 16 days after test start 10 p/si

2. Continental Wire + Cable Co. - TOR item 107

File comment - Similarity

talked to them about this

Comments - No specified op. time in file. Why is 26 day test ok?

talked about this

Unsigned, unhooked, unapproved, undated handwritten sheet - Q.A.?

talked about this

Statement on handwritten sheet does not demonstrate similarity - How was it demonstrated?

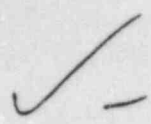
Need ltr. from manuf. to demonstrate similarity

I, F-C4350-2, 7/76, prepared for The Anaconda Company, applicable to Continental Wire cable?? (Anaconda ~~is same~~)
yes

or, documentation in file linking test specimens, as described in report, with TME-1 cable (pull slip)

talked about this

File contains no documentation to show a qualified life of 40 yrs, based on data in test report.



Technical Report F-C4350-2, "Tests of Electrical Cables Subjected to Thermal Aging, Gamma Radiation and a Loss-of-Coolant Accident Simulation," 7/76

- Rapid rise to 346°F at steam press. >110 psig (280°F/70 psig within 10 sec.)
- 8 hr dwell at 346°F + 110 psig
- ~~3 hr~~ Cool down to 335°F + 96 psig in 1/2 hr
- 3 hr dwell at " " "
- Cool down in 1/2 hr to 315°F + 69 psig
- 4 hr dwell at " " "
- Cool down to 265°F + 28 psig in 1 hr
- 81 hr dwell at 265°F + " "
- Cool down to 212°F, 0-5 psig in 45 min
- 26 day dwell at 212°F @ a steam air pressure of ~4 psig.

3. States terminal block - TER item 110
Model NT

FRL - Category I.a

Comments: - No specific operating time in file
Why is 8 day test O.V.? How long is
it qualified based on 8 day test?

- o Talked to them - What is specific function? (power for pumps)
Other functions? - not sure
- o " - Why are low IR readings acceptable?
(O.V. for pumps - what else?)
- o " - Do Foxboro's go thru terminal block?
- don't think so
(40 yr life)

✓ - "Terminal Block LCA Test for Electrical Penetration Assemblies," by R. M. Schuster, G.E., 11/6/73

260°F, 21 pr/s., 100% R.H.	1.5 days
320°F, 75 "	1.5 hrs
340°F, 103 "	3 hrs
320°F, 75 "	4.5 hrs
260°F, 21 "	8 days

~~Write up on how spec. test~~

4. Foxboro α flow transmitter - no TCR item no (new)
 NE13DM, FT-791, 779, 782, + 784
 NUREG-0737 item II E.1.2

Comments - Specific accuracy requirements not addressed
 in file. p. iii states end user must
 address for each application & evaluate
 total loop error.

Talked about
 this -

No specified operating time or qualified
 time in file (SC&W sheet says duration of
 accident & qualified for continuous).

11 - File contains no aging analysis or qualified
 life determination (other than the 23.62
 years on the SC&W sheet.)

11 - Are transmitters installed as tested?
 (Interfacer.) (Cable connectors elec. conductor -
 seal assembly with integral electrical junction box
 or 7-1/4" minimum leads) Section I, p. 2 - holes
 were drilled in flexible conduit.

11 - Seismic part of test sequence - does test
 envelope TMI seismic curves?

11 - File does not indicate that normal radiation
 simulated in test envelope; TMI-1 conditions

11 - Why do SC&W sheets show rad. qual. to 5×10^4 R?
 Testing was done to 2×10^4 R (mistake)

Refer to them -

Section IX, p. IX-22, NOA F37 - this page states that a formal report will be issued to answer this NOA. Has report been issued and reviewed by GPU? (Are ps. IX-23 + 24 that response?)

ii - Section X, p. X-25 -, justification for the test interruption will be provided in the final test report. Does GPU have this final test report and evaluated it? (NOA F42)

✓ - Section XI, p. XI-1, Conclusions state that Foxboro N-E10 series transmitters are qualified as described in this test report. ~~System~~ (Test Report, WYLE 45592-4, for N-E10 series) Are N-E10 series same as N-E11 + N-E17? Yes

8 - No evidence in file that report has been reviewed (see Mat's comment)

✓ - p. ii of report says accident radiation dose of 2.2×10^4 rads - elsewhere it states 2.0×10^4 + that further testing would be done to extend to 2.2×10^4 R.

o ii -
Other
Foxboro

p. iii states that additional testing is being performed by the manufacturer to extend the accident radiation qualification and to confirm the aging analysis for the silicone caprule O-rings

of transmitter represented by F-1. (N-E11)

✓ - Specified accident profile as shown in Fig. 23

11 - File should have Foxboro Report No. PER-81-106 which is stated to provide justification for qual. of untested by similarity to tested units. (p. I-7) (Foxboro document QOAA C012?, p. I-171)

⚡ (Note: If using only for aging & qual. life then still need similarity documents for E11AM-SAH2.)

Dave Harding

..... Square D Transorb Suppressor
Diode

- 0 GPU Reference: MIL SP 19500/507A
Which describes ^{Temp} Testing. See copy of
standard
- 0 Testing was not done in a steam or
moisture environment GPU states not affected,
(See copy of SCW sheet)
- 0 Rad. Testing was on a IN5624
model on SCWS - IN 6071A
- 0 NO CALCULATION OR ANALYSIS ON QUALIFIED WIRE
- 0 SCW sheet states sequential testing. GPU
DOC. DOES NOT REFLECT THIS
- 0 LOCK HILB, MSIB TESTING WAS NOT DONE.

* 0 GPU STATES THERE ARE NO ASCO SOLENOID VALVES
IN THE EFW SYSTEM THERE ARE NO SUPPRESSOR
DIODES. SOUNDS REASONABLE.

GPU IS EVALUATING OTHER ASCO IN HARSH
ENVIRONMENT TO SEE IF THEY HAVE TRANSORB
DIODES.

FOXBORO TRANSMISSIONS

Review of the Foxboro Files for models E11GH-H1NM-2, E11AM-SAH2, E11GM-HSAE1 given to the reviewer has essentially the same deficiencies stated in the FCC Tech.

However, the SCOW sheets referenced a Wyle Report 4559204, not contain in this particular file.

Further investigation showed G.P.U. does have the Wyle report and is included with the NUPC 0737 Foxboro file.

(See Foxboro Review by Bob Langrange)

This type of omission indicates additional review ^{and update} of the E.Q. files by G.P.U. is greatly needed.

See Genetic Statement:

22111 50 SHEETS
22112 100 SHEETS
22114 200 SHEETS

I Ident.

MFR. - Westinghouse Motor
 model no. - HP 450, 588.5H Frame, style 68F21661

PLANT ID - EF-P2B

II General INFO

FUNCTIONS: TO SUPPLY Feedwater TO THE STEAM GENERATOR IN THE SYSTEM - Emergency Feedwater (event of LOFW or MSLO)
 LOC. INTERMEDIATE Bldg

III Specified ENV.

- a) Peak Temp - 322.0° (to seal)
- b) H Press - 23.6
- c) RH - 100%
- d) Chem stray - N/A
- e) Rad. - Neg
- f) operability Time - 2 HR
- g) Sub - N/A

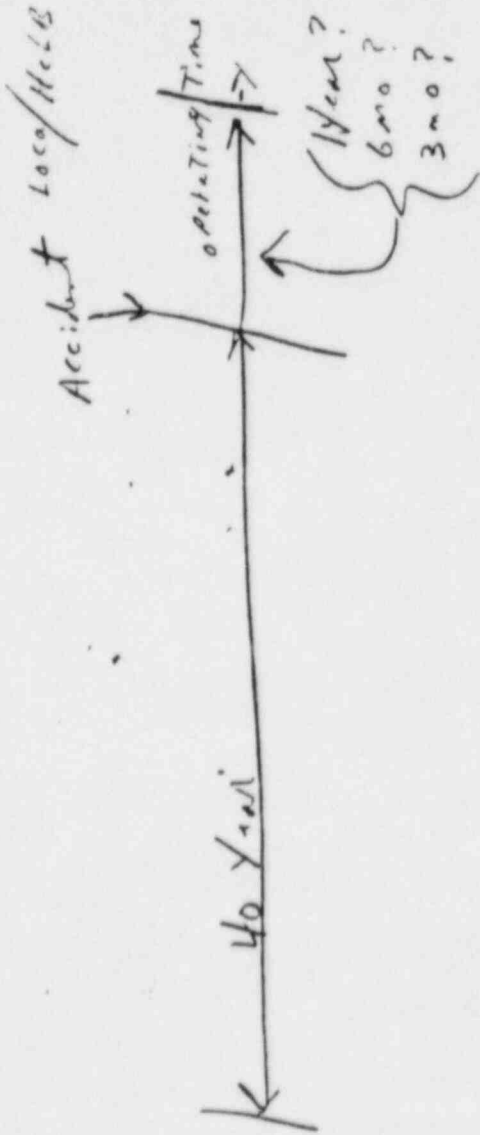
IV Test ENV.

- a) Test Dept. - WCAP 7829⁴⁹⁷⁵⁴ Fan cooler motor unit test
- b) Peak Temp - 324°
- c) Peak Press - 25 psic
- d) RH - 100%
- e) Chem stray - N/A
- f) Rad. 2×10^3
- g) Test Dur. 21 HRS
- h) sub - N/A
- i) margins - adof
- j) aging - 21 Day @ 200°C
 g/lj - 40 Years with
 method - TEST + ANALYSIS

50 SHEETS
 100 SHEETS
 200 SHEETS

22 141
 22 142
 22 144





WCAP MOTOR COMMENTS

- ✓ 1) GPU STATES SCRW - Have NOT been updated
TO REFLECT LATEST TEST DATA.
- ✓ * 2) THIS FILE DOES NOT CONTAIN SIMILARITY INFORMATION
OF INSTALLED TO TESTED MOTOR / LEADERS + INSULATION
GPU HAS REQUESTED THIS INFORMATION IN A
LETTER TO WESTINGHOUSE DATE MARCH 15, 1984
- ✓ 3) A 500 HP FRAAM WAS TESTED ~~WITH~~ A DUAL 4/6 POLE
20 HP WINDING WAS TESTED
- ✓ * 4) GPU FILE CONTAINS A ^{ONE PAGE} HAND WRITTEN UNSIGNED STATEMENT
THAT THESE MOTORS ARE QUALIFIED + SHOULD BE PLACED
IN THE NRC I.A. CAT.
- ✓ 5) WCAP TEST REPORT 7829 STATES MOTOR WITHOUT
HEAT EXCHANGER IS QUAL. FOR SHORT TERM POST ACCIDENT
OPERATION. (JMI) NO HEAT EXCHANGER

22.141 50 SHEETS
22.142 100 SHEETS
22.144 200 SHEETS

Keyite Cable Comments

- 1) GPU Files do NOT contain analysis:
For qualified LIFE, GPU states; Qual.
Life can be established. (Just needs more
work)
- 2) The establishing of similarity is NOT
clear. IT is NOT clear if Doc. is
IN House, or can be acquired.
GPU verbally states; they can go to
full ships + with existing Doc. IN Files
establish similarity
- 3) GPU Keyite File contains a one
page, handwritten, unsigned statement that
these cables are qualified, and should
be placed in the NRC I.A. cat.

Kavita cables

I Identification

MFR: Kavita
Model No: NA
Description: ~~Common~~ ^{Cable} ~~through out plant~~
Plant ID: Various

II General Info.

Function: Power + control cable
System: Common
Location: Through out plant

III Specified Envir.

- A) Peak Temp: 322°F
- B) " Press: 23.6 PSI^g
- C) R.H.: 100%
- d) Demin spray: 2000 ppm H₂O 2270 ppm Corros with NaOH pH 9.5
- e) Radiation: $2. \times 10^9$
- F) Oper. Time: 2HR
- g) Sub. N/A

IV Testal Envir.

- a) TEST REPORT + NO. FILE. F-C 2737, F-C 2720
- b) Peak Temp. 322°F
- c) Peak Press. 82 PSI^g
- d) R.H. 100%
- e) Spray 1 1/2 % solution of Boric acid + distilled H₂O pH 9.5
- f) Radiation 3.4×10^9
- g) Test Duration 12HR
- h) Submergence N/A
- e) margins
- f) aging
 - 1) Time/Temp - NOT ESTABLISHED
 - 2) Q/L - " "
 - 3) method of quick - TEST

Generic Concern

- o NO WRITTEN ^{or signed} Evidence THAT GPU Management, Q.A, OR Engineering HAS Reviewed The E.Q. Files. IT appears GPU'S Files are assembled in a hurried, disorganized, and incomplete manner.

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



Anacanda Cable (for I/P Converters)

- 1) TDR No. 542 - p. 4 of 6, questions are raised concerning qualification of Kevite Co.
- 2) F-C4836-2, dated 1/78, "Qualification Tests of Flame-Guard FR-EP Instrumentation and Control Class 1E Electric Cables in a Simulated Steam-Line-Break and Loss-of-Coolant Accident Environment"
- 3) What is applicability of Anacanda-Ericsson Reports 80220-2 (11/81) and 81028-2 (11/81)?
- 4) File contains no specified operating time, no qualification time, and no indication that cable will have to operate submerged
- 5) What is exact cable that must be qualified?
- 6) F-C4836-2 states that specimens were passed to the outside of the test vessel through metal tubes and sealed with epoxy potting compound. How are these cables installed in TMI-1 and why does testing performed demonstrate they are qualified?
- 7) F-C4836-2: cables thermally aged at 150°C (300°F) for 168 hr - what is qualified life?
- 8) File contains no discussion of accelerated water-absorption test for demonstrating qualification to

(i)
1. Emergence, e.g., no pre-aging, had not gone
thru HELB, etc.

9) 40242 is a post-LOCA test to test
performed and reported in FC4836-2.

BIT Cable

- ① From the review of the file and its procedure, it becomes clear that GPU has not developed a check list for the use to review the equipment qualification file.
- ② Based on the review of the file it also becomes clear that GPU has not completed the supplementary SCEW sheet giving the status of qualification.
- ③ Based on the GPU procedure the responsibility for review lies with many different engineering disciplines, however from the file it was not evident, how these reviews and comment resolution were documented.
- ④ Test report document used for qualification is a summary document. A summary document by itself is ~~not~~ not an acceptable way to document qualification. GPU should ~~either~~ review the complete test report and ~~then~~ ^{also} review ~~the~~ ^{relevant} documents in the file. ~~along~~ Also the test report should be available either here at GPU or BIT for the life of the cable.
- ⑤ In accordance with the summary document submergence test was not done in sequence. However the SCEW sheet states it was sequential. No justification about

acceptability of such test on a cable unaged and without LOCA testing is provided in the file.

- ⑥ Aging consideration should include the condition of the component ~~is~~, whether the component ~~is~~ energized or deenergized during normal operating condition. In case of cables heat use because of the current flowing through the conductors.
- ⑦ Figure 7 of the test report shows the LOCA profile extended to 367 days while the description and measurement indicate that the test was discontinued after 161 days. Explain.
- ⑧ SCEW sheet for the component does not provide the required post-accident operability requirement and qualification for the parameter.
- ⑨ Part No. on the SCEW sheets and telephone conversation with the field design engineer.

ITT CONO FLOW I/P Transducer model
T 2500 1926.

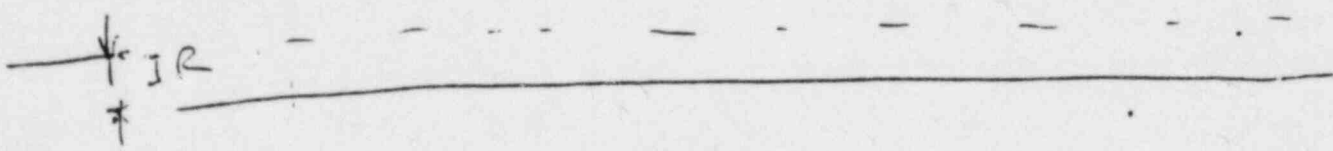
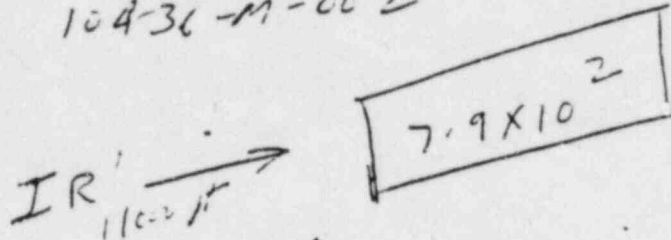
- o This I/P Transducer is to replace the E/P converters in the Emergency Feedback/Feed forward system
- o GPU has a Policy and Procedure Manual (EP-021) which provides guidance for review of equipment files. When used this procedure would produce scan and summary sheets for each equipment item. The ITT CONO FLOW I/P Transducer file does NOT contain scan or summary sheets of the GPU service condition parameters.
- o There is no evidence that GPU used their procedure to establish qualification for the ITT CONO FLOW I/P Transducer.

0 GPU HAS a letter with 4-20-94 which states
an Arrhenius calculation @ 90°F and 0.75 eV predicted
IN a 51 YEAR qualified life.

These calculations were NOT contained in the file.

BITW Cable

13660 M-006
104-36-M-002



- ① How come radiation value is N/A?
- ② Aging should be considered not only on the environmental conditions but also based on the energized condition of the equipment.
- ③ Submergence test is not done in a sequential method
- ④ P/N on crew chest and telephone connector is different.
- ⑤ Test report is a summary document.
- ⑥ Reel 1 and 2 are for shielded cable test report is for 7/C cable.

Insulation thickness	.029	=	29 mil
JKT Ins thickness	.016	=	16 mil

Meeting with GPL

5/7/54

John Hagan }
Al Sawyer } Impell

- ① Unqualified equipment are being used in emergency procedure -
- ② All design basis accidents are included
- ③ All equipment exempted from the qualification and are located in the worst environment, the basis for exemption should be documented.

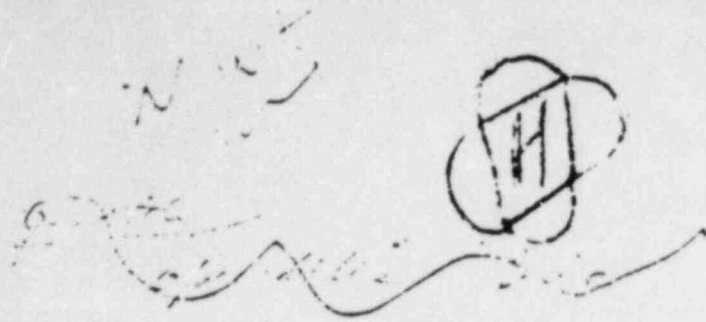
Responses by 5/9

Audit by 5/15

Overall submitted 5/15

ETW Cable

- ① How the post accident operating time (required) was determined? Reference 1 does not provide any guidance
- ② Aging temperature listed is 90°F.
- ③ File does not define. Profile # 3
- ④ Where is the system analysis document which defines the operating time of 7 days only?
- ⑤ How can the operating time be 119 hours when it is required for 7 days for submergence?
- ⑥ Flow transmitters in REF 101-4 listed are different than on SCEW sheet



This should be considered
open until the test report is reviewed

- ⑤ Submergence test for the cable is done only for 5 minutes. ~~to~~ Six months test was done separately
- ⑥ Scow sheets should be revised to state 90°C as aging temperature
- ⑦ Will ~~be~~ be resolved with the test report review.
- ⑧

E J W cable

Hukera ①

① Level of qualification to 71 27000
or NUREG-0000 category 1 & 2
identified.

② How the determination for temperature
profile for cable was made? Why the
profile for other elevation is not
applicable?

③ Range temperature in the cable
is listed as 90°F. Why?

④ How can the operating time be
1.9 hours when it is designed to
operate for 7.2 hours?

⑤ Where is the system analysis
documented and signed by the
designer?

⑥ Found about 1000 pages of
documentation for the cable
design. How many pages are
relevant to the cable design?
How many pages are not relevant?
How many pages are not relevant?
How many pages are not relevant?

The first thing I noticed
 when I stepped out of the
 plane was the humidity.
 It was a relief after the
 dry air of the coast. The
 temperature was about 80

degrees. The humidity was
 not sticky, but welcoming.
 I had heard that the humidity
 was terrible, but here it was
 perfect. I had heard that the
 humidity was terrible, but here it was
 perfect. I had heard that the
 humidity was terrible, but here it was
 perfect.

The flow of traffic was
 out of different lanes. A

① There is no evidence from the file ~~that~~
about ~~it~~ ^{the} has ~~been~~ reviewed and verified ~~from~~ ~~it~~
Also in accordance with r

File does not identify which profile
has been used.


- Ⓒ acceptance criteria
- Ⓒ Test anomalies
- Ⓒ Inst. calibration data
- Ⓒ

EQTM-
File 104

- ✓ 1. No motor manu. identified in 104-7 for FW-V-SB + 92A - many other missing manu.
- ✓ 2. 104-07 identifies some items as needing aluminum limit switch gear frames replaced with bronze. Has that been done?
3. 104-07: What items are Note, 1-3 applicable to?
4. 104-06 identifies insulation class, but not motor manu. (Table of contents shows 104-06 ~~is~~ related to motor ID.)
5. 104-07 identifies switch/brake, ^{current type,} + apparently manu. (Table of contents shows 104-07 related to only switch/brake IP.)
- ✓ 6. Was ~~the~~ info. in 104-06 + 07 from plant walk down? What was source of info. (Addressed by 104-09)
7. Is 104-07 motor manu. ID consistent with section 4.0 of 104-02?

8. Section 4.4 of 104-02 states that B0003 demonstrates elec. internals are sealed from moisture. How does report demonstrate that? Are TMI-1 valve actuators sealed?
9. SCOW sheets identify specified operating time of 1.9 hours & qual. time of 16 days. Is it acceptable for equip. to fail at 1.9 hours after break? (Qual. time is certainly longer than test duration of 16 days.) Section 4.9.1 of 104-02 identifies a maximum operating time of 30 sec. Are operators ever required to operate again after initial operation?
10. 104-09 discusses field walkdown - should be completed prior to restart & file revised if necessary.
11. 104-17 states SUIR press. switches are required to be replaced. Have they been?

General Comment:

 3'
(96556.0)

- ✓ 1. Ref: on SC&W sheets vs. Table of Content
- ✓ 2. Op. Time ~~is~~ required & demonstrated
- ✓ 3. Review (acceptance) ~~is~~ criteria, GPU conditions
- ✓ 4. Field verification - correct model, etc. - interfaces are very important
- ✓ 5. How are replacement intervals (from qual. life calc.) factored in maintenance program?

Comments on revised draft -

- ✓ 1. Do not want revised SCEW sheets submitted. SCEW sheets are only part of EQ file.
- ✓ 2. p. 1-2: Where is supporting documentation for required & demonstrated op. time?
- ~~3. EQ procedure should address how Ii Info.~~
- ✓ 3. p. 2-1: "being replaced for other reasons"?
- ✓ 4. p. 2-2: Can not review C-1101-424-5350-014 - not with file.
- ✓ 5. p. 2-2: How was it determined that TMI-1 motor insulation is identical to WCAP-7829 test motor? ~~Does GPU have WCAP 7829?~~
- ✓ 6. p. 2-3 - Item 2 response - more detail
- ✓ 7. p. 2-3: C-Item 1. - state ~~that~~ it was not provided ^{for review at} ~~an~~ NRC audit.
- ✓ 8. p. 2-31 C.2 - more detail
- ✓ 9. p. 2-4 - D.2 - GPU reviewed & agreed

✓ 10. p. 2-6 = G-3 - how was it concluded box connections are watertight?

✓ 11. p. 2-11 - Item 3 - required + demonstrated up time + file should indicate required for subsequence

~~12. p. 2-11~~

✓ 12. p. 2-11 - Item 4 - state that test report applicability has been established + how

✓ 13. p. 2-11 - Item 6 - GPU should state they reviewed + agree

✓ 14. p. 2-7 - Item 2 - 2×10^7 ; not normal radiation

✓ 15. p. 2-7 - Item 4 - wording not correct

EQ Audit GPU
TMI 1

5/21/84

- ① Level of qualification category 1, II or 77-015
- ② Reference should be listed if some analysis is done to resolve the comment.

States Terminal Block

EQ-TM-102

1. SCEW sheet references profile # 4 as required temp. profile. This could not be located in files provided.
2. ^{on SCEW sheet} Ref. 3 and 4 A are the same as ref. 102-01 and 102-02. Might be less confusing if all numbers are consistent.
3. Thermal aging of nylon rivet is addressed only by stating that Cont. Serv. Temp is $\leq 50^{\circ}\text{C}$. Show that mat'l properties are not degraded after 40yr life claimed.
4. IR calculations only address error introduced to individual component (eg. RTD). Show that 13.5°F error is acceptable as part of total loop error.
5. Radiation resistance of TB is not demonstrated simply by referencing Wylie Report. The results of the Wylie test should be stated.

CONC FLOW I/P CONVERTER

- 1) How was the post. operating time of 1.9 HR developed? Ref. 1 Does NOT ESTABLISH THIS. OPER. TIME. SCREW SHEET ALSO REFERENCES PHOTOFILE 3. THIS PHOTOFILE DOES NOT ESTABLISH THE 1.9 HR OPERATING TIME.

PLEASE RESPOND.

- 2) The SCREW SHEET HAS MODEL NO. GT-45CA1826. THE PURCHASE ORDER WAS FOR MODEL NO. GT25CA1826. THE TESTING WAS ON TWO MODEL T25 I/P TRANSDUCERS.

PLEASE EXPLAIN THIS DIFFERENCE.

- 3) DURING THE SLB TEST A 19ma SIGNAL WAS SUPPLIED TO THE TRANSDUCER HOWEVER THE SPECIMEN WAS NOT OPERATED DURING THE 320°F STEAM CONDITION.

HOW IS GPU ASSURED THIS COMPONENT WILL OPERATE DURING ACCIDENT CONDITIONS?

The Files should contain
a statement from GPM stating
they have reviewed all Test Reports,
ANALYSIS, Calculation and other
applicable Doc. and have found
the Equip. Item qualified to
"such and such" standards.

This statement should be included in
each file. Has GPM done this?



Westinghouse HP 450 Pump Motors (EQFM 107)

The following items are requested to evaluate the EQFM 107 Package.

- Steam Test Data for Westinghouse,
 - Package 107-11 - Westinghouse Electric Corp. "Fan Cooler Motor Unit Test" WACP 7834, April 1972 and, (Not Applicable to TMI-1)
 - Package 107-12 - GPUN Calculation No C-1101-424-5350-014, Environmental Qualification of TMI-1 Emergency Feedwater Pump Motors, dated May 23, 1984
- Address the subject that the TMI-2 Pump Motor Installation does not have a Heat Exchanger. How does the qualification Testy address this subject.

A. F. Kel.

6/25/84

UCS Supplemental Petition

- 1.) p. 3 - Limiting - File EW TM 104
- File now contains listing of actuators and motor manufacturer, insulation class + current type. (Reference no. 104-05)
 - listing was generated using maintenance records
 - program currently underway to verify data + will cross-check info. on bill-of-material from Limiting + that from maintenance records + a field walkdown.
 - A computerized ~~data base~~ database will be maintained by GPU Nuclear to insure this data is maintained in a correct + auditable form

- 2.) p. 5 - EFW pumps - File ~~EW~~ EW TM 107
~~interfered from~~ ref # 107-16,
- Documentation in file, WCAP 10575, Rev. 0, 6/19/84, "Eval. of the operation of EFW Pump Motors in a HELD Env. for GPU's TMI Unit 1 Nuclear Power Plant + other documentation established availability of TMI 1 motors + motors, lead wire + insulation tested.

* (p. 2-3 of 5/31/84 response - Calc. referenced in response to Item 2 of EFW pumps, stated to be in file - Calc is dated 6/22/84 (+ one 6/30/84))

*** Limiting - close out of IN not yet complete until letter received from Limiting

(2)

3) p. 6 - Continental Wire - File EQ TM 108
- File contains ref 108-04, pull slips & 108-05 cable description for GPU spec is traceable to cable tested & described in 108-01 (F-C4836-2)

- File contains ref 108-03, a 5/21/84 letter from Anaconda Wire & Cable Co. with attachment to F-C4836-2 that can be used to test

3) p. 6 - Anaconda cable - File EQ TM 109
- P.O. 40067, ref. 109-03 ^{describes TMI-1 cable}

* - ~~Anaconda~~ letter of 2/15/84, 109-02, & Continental Wire & Cable letter of 10/24/78, 109-01 ~~used to test test~~ provide test data. 109-05 cites F-C2935 (109-01) test report. However, ~~this~~ this test report does not describe test samples as the same as 109-02, 03 & 05. Need more info. &
- ref. 109-04, 6/4/84 letter Continental Wire & Cable provides Arrhenius Plot to establish qualified life of 40 hrs at 114°C for TMI-1 cable

* EQ TM 108 - similarity also not established!

* No analysis of how long cable is qualified
(same in ~~months~~) post-accident. Also, ~~what is basis for~~
(6 months, u.k. for specified op. time.)

- 4) p. 6 - Kerite - File EQ TM 111
- Ref 111-02, letter from Kerite dated 5/16/84 establishes applicability (similarity) between TMI-1 cable & test cables in Kerite Report "TMI-1, GPU & Met Ed. Co. Qualification Documentation for Kerite HTK/FR Power Cables" A 8/21/81 (Ref 111-01)
- ^{met} Ref 111-01 describes girth performed good for 25 yrs at 90°C

Limitorgue

In accordance with Document 104-09 to dispose TE IN 83-72, GPU has stated that during a telecon with Limitorgue, Limitorgue has stated that only Midland contained the motor operated valves with underseat terminal blocks. ~~However,~~ GPU also stated that they will get the letter from the Limitorgue to confirm the telecon. However, GPU ~~will~~ do not have the letter in file at this time.

TMI - 1 audit

6/25/54

BIW : O.K. except minor corrections

Limitique

Letter from Limitique → to confirm

TT

9/6/84

- EW TI 107

W Pump Motor

Model - style 68F 21661

qualified to DOR Guidelines

SCCW { special 46 hrs (until ~~RHR~~ decay
qualified for 189 hrs next removal system take)

Ref 107-11: shows test motor tested for 189 hrs

WCAP 7829, April, 1972

"Fan Cooler Motor Unit Test"

- EW TI 104

Continental Wire & Cable Corp.

Model EW 15E

600V inst. cable

SCCW { qual. to 0504, cat 1 (? or DOR Guidelines) with H, L, M water absorption
Spec. 46 hrs
Qual 101 days

↳ Test reports in file 100-1 + 100-2

↳ show test cable tested for 101 days

after start of accident

Similarity: 100-7 + letters from ¹⁰⁰⁻⁶ Amco Wire & Cable Co., dated 6/29/84, to GPU

establishes similarity between test cable,

and GPU cable (100-7 - accident testing,

100-6 - water absorption) 100-7 unsigned

*

standing another signed copy.
GPU was to send it to is
on vacation - files contain
nothing - signed copy
received while we
was there. - 8/4/84.

Write 600V & 5KV Power & Control Cable
 - EQ TI 111 SCEW { spec. 6 m ✓ O.K. but why? * TDR 54 in ref for EQ TI 101 Good!

Ref 111-10 is a GPO calc. C-1101-770-5350-00 Rev. 0, dated 7/27/87. Using Arrhenius methodology, it is shown that cable is qualified for much greater than 6 months after initiation of accident

- EQ TI 102 ^{States} SCEW 8/12/87 { spec. 6 m ✓ den. > 6 m ✓

* Impall Calc. No. 0370-079-003, Rev. 0, 7/23/87
 O.K. Ref 102-11 Using Arrhenius method calc. shows den. q. time much > 6 m. - good.

- EQ TI 109 Continental (Auracord) Model CC-2193 Silicone Rubber Insulated Inst Cable

Similarity: Ref. 109-05 = same little ^{uninsulated} * signal sent via non conversation - sinking another
 EQ TI 108, ref 108-7, establishes applicability of test results to TMI-1 cable - good.

SCEW { spec 'd 6 m
 schem > 6 m Ref 109-05

* Impall Calc. No. 0370-079-002, Rev. 0, 7/2/87
 O.K. Using Arrhenius method shows den. post-accident m. time > 6 m - good

EU TI 104

Lim. torques

File cover	EF-V-1A+B	16
	EF-V-2A+B	16
	FL-V-5B	16
	MS-V-2A+B	16
	CU-V-14A+B	16
	CU-V-11A+B	16
	FW-V-82B	16

30 Cl. RH ✓

SCCU 4/13/59 { spec. 46 hrs -
 done 16 days ✓
 + 30 days Cl. RH ✓

Sub Ticket
 written for both
 + work in progress

Ref 104-1 ; p. 10. 16 day test in cu.

Walkdown performed: EF-V-1A+B & CU-V-11A+B did not have terminal blocks, but had splices.

* Splices will be replaced with Peltone (maintenance order issued)

* Field walkdown showed CU-V-11A+B have poorer meters. Will be replaced with Peltone, Cl. B, to make them qualified.

* Previous Ref 104-05 deleted - Applicability of test reports to TMS-1 equip. now established by combination of letters from Lim. torque (Ref. 104-11) and field walkdown (described in new Ref. 104-05) Results of walkdown ~~also~~ indicated in various notes in file

JEIN 83-72 evaluation contained in Ref 104-19

Field verification results used. U.K.

~~that~~ (performed during last couple of weeks)

- Motor manu. from field walkdown - suggested file should document clearly
-

Radiation deficiencies - response to Commission Order

GPU discussed how they are assembling documents for our review.

- ✓ * 4 new actuators
1. 104 - Limitecques: ✓ a) IEN 83-72
 ✓ b) Raychem splices (new file?) ← 134
~~c) Reg'd/demonstrated op. time.~~
 2. 107 - Pumps: a) Reg'd/dem. op. time
 3. 109 - Anacula: a) Similarity
 b) Reg'd/dem. op. time.
 4. 111 - Verite: a) Reg'd/dem op. time
 5. 102 - States: a) " " " "
 6. 110 - Foxboro's: a) Two anomalies
 ✓ b) Reg'd/dem op. time
 7. 106 - Conoflow: a) Model No. ✓ Rev. 5/31 letter? *
 b) Similarity (ltr. from man.)
 8. 109 - Continental: a) Similarity
 b) Reg'd/dem. post-accident op. time
 9. 101 - BIW: a) " " " " " "
 10. 126 - Verite splices: a) Eval. of test failures
 b) Reg'd/dem. op. time.
 11. EQ TL 134 - Raychem WCSF-200-N
 Low Voltage Splice (LKV)

Ret Chem 211002 Low Nitrate (100,
mod. # WCF-211002

) w/... 58442-1 May 15, 1970

ITT COND FLOW I/P CONSULT

Similarity:

A LETTER DATED APRIL 25, 1964 FROM ITT
COND FLOW TO GPU ESTABLISHED SIMILARITY.

THE MODEL NOS GT45CA1926K AND GT25CD1926
ARE DIFFERENT IN INPUT RANGE ONLY. REPORT
3491 REV 1, DATED OCT 15, 1963 IS APPLICABLE

Operating Time:

GPU HAS A TEST PROPOSED EXTRAPOLATION FOR
THE COND-FLOW I/P TRANSITION.

THE DEVICE WAS TESTED FOR 9.5 HR. THE
PLANT INCIDENT ENVIRONMENT RETURNS TO
AMBIENT IN 1.7 HR. THEREFORE 6.5 HR @ 212°F
IS EXTRA TEST TIME. USE OF THE APPROPRIATE
EQUATION YIELDS 60.6 HR OPERATING TIME.

Ke. Te. Splice Splices

GPU performed an analysis addressing the
test anomalies for the Ke. Te. Splice
assemblies with Ke. Te. splices, in Wyle Report
45453-2. This analysis was reviewed, signed,
& dated 7-27-94 by GPU Engineers.

A letter ^{signed} from The Ke. Te. Contract dated Aug.
3, 1994 states: Ke. Te. has reviewed GPU's final
analysis and concurs with the evaluation.

There is adequate documentation to solicit
qualification of these splices in GPU's