



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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APR 06 1984

R. LaGrange

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MEMORANDUM FOR: John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing

FROM: Vincent S. Noonan, Chief
Equipment Qualification Branch
Division of Engineering

SUBJECT: RESULTS OF ELECTRICAL EQUIPMENT ENVIRONMENTAL
QUALIFICATION AUDIT FOR THREE MILE ISLAND, UNIT 1

On March 20 and 21, 1984, an audit was performed of the TMI-1 electrical equipment environmental qualification (EQ) files by Bob LaGrange, Equipment Qualification Branch, and Max Yost, EG&G, Idaho, with assistance from the Project Manager, Jim Van Vliet. Attached are our comments based on the results of that audit. Although the main purpose of the audit was to review the EQ files for EFW equipment in order to provide a basis for our forthcoming SER addressing the UCS 2.206 petition, the comments should be evaluated by GPU for applicability to all TMI-1 EQ files, as stated in the enclosure.

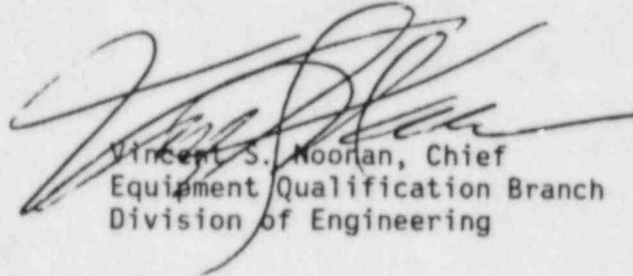
In general, we believe that the files contain documentation that can be utilized by GPU to provide the basis for demonstrating that the equipment is qualified, with the exception of the Square D diodes. In our opinion, however, a significant amount of effort remains to be put forth by GPU in order to make the files a complete and auditable record of qualification. We believe the condition of the files is directly related to the amount of resources dedicated by GPU to work on the EQ issue. It appears to us that GPU management's involvement in this issue is not very extensive. We have the impression that the two GPU individuals assigned to this work are relying to a great extent on our input to them, and that their efforts on EQ are based in large part in reaction to that input.

One area of concern that was expressed to GPU during the audit involves QA requirements relative to the EQ files. The files appear to be subject to very little, if any, QA requirements. For example, when there is evidence of GPU review of the EQ documentation, it is often in the form of unsigned, unchecked, unapproved and undated handwritten pages. We believe the attached memorandum from G. Ted Ankrum, QAB Chief, to P. J. Morrill, Region V Reactor Inspector, should be forwarded to GPU along with the attached comments. The memorandum is the QAB interpretation of Appendix B requirements concerning environmental qualification files that was developed as guidance to Regional Inspectors.

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As stated on the attached audit results, GPU should update all TMI-1 EQ files in accordance with the comments resulting from the audit. GPU should be requested to confirm in writing that the EFW equipment EQ files have been updated, and that all TMI-1 files have been reviewed and updated. Our SERs addressing the UCS 2.206 petition and 10 CFR 50.49 compliance will identify this response from GPU as a confirmatory item.



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Enclosures: As stated

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Equipment Qualification Branch
Results of Electrical Equipment
Environmental Qualification Audit
GPU Nuclear Corporation
Three Mile Island, Unit 1
Docket No. 50-289

On March 20 and 21, 1984, the NRC staff and a consultant from EG&G, Idaho, audited the electrical equipment environmental qualification files for Three Mile Island, Unit 1. The primary purpose of the audit was to review the environmental qualification documentation relied upon to demonstrate qualification of electrical equipment within the scope of 10 CFR 50.49 that is associated with the Emergency Feedwater (EFW) System. A total of seven files containing EFW equipment qualification documentation were reviewed. One additional file for equipment not associated with the EFW system was reviewed.

During the course of the audit, the staff and its consultant asked questions of and provided comments to GPU concerning the files and documentation reviewed. Some of the comments are applicable to all the files the staff and its consultant audited, and are very likely to be applicable to all GPU EQ files. In addition, comments on the specific files audited may also be applicable to many other files. Therefore, GPU should review all EQ files and update them, as necessary, in accordance with the comments identified below. The comments made by the staff and its consultant which are applicable to all the files reviewed are listed first, followed by the comments made on specific equipment files.

1. The EQ files contain no indication; other than SCEW sheets (some of which were in the process of being revised) and some brief handwritten sheets, that the documentation has been reviewed by GPU nor that it has been concluded by GPU that the equipment is qualified.
2. Most of the handwritten material in the files is not signed or dated and shows no indication that the statements/information contained on these sheets has ever been verified by a checker or approved.
3. The files do not specify the required post-accident operating time for the equipment nor the duration of time the equipment has been demonstrated to be qualified. Specifying duration of accident on a SCEW sheet and referencing the FSAR is not adequate. Similarly, indicating on a SCEW sheet that qualification has been demonstrated for continuous operation or for the duration of time for which the equipment was tested is neither correct nor does it document why such a post-accident operating time is acceptable.

Limitorque Motorized Valve Actuators ✓

EF-V1A&B, Model SMB-000, TER Item No. 15

EF-V2A&B, Model SMB-0, TER Item No. 11

1. The file should document the motor manufacturer, insulation class and current type for each actuator to establish applicability of the EQ documentation.
2. The temperature profile used to evaluate the qualification of the actuators is a time history following a main steam line break for evaluation 295 ft. of the Intermediate Building. However, the temperature profile resulting from a steam supply to EFWP turbine line break appears to be a more severe environment for approximately the first 800 seconds. The file needs to contain justification that establishes the adequacy of the EQ documentation for demonstrating qualification to this more limiting line break.
3. GPU should review Equipment Environment Qualification Notice No. 24 of IE Information Notice 83-72, and document the results of their evaluation of that information in the file. (This comment was not provided to GPU during the audit.) If it is concluded that information in that Notice is applicable to TMI-1 equipment, GPU should notify the NRC prior to restart.

Westinghouse Pumps ✓

EF-P2A&B, Model HP 450, TER Item No. 51

1. The file does not contain information to establish similarity between these motors and the motor, lead wires and insulation tested. A March 15, 1984 letter from GPU to Westinghouse requests the information needed to establish that similarity. A response to this letter should be pursued and placed in the file.
2. One of the EQ documents in the file, WCAP 7829, states that a motor without a heat exchanger is qualified for short term post-accident operation. The file should document whether the installation in TMI-1 includes a heat exchanger and, if not, the adequacy of the EQ documentation for demonstrating qualification of the pumps for the period of time they are required to operate post-accident.

Continental Wire and Cable Co. Cable ✓

TER Item No. 107

1. The file contains no documentation to establish similarity between the cables tested and those installed. The file must contain either a letter from the manufacturer that establishes the applicability of the test report, or documentation describing how GPU has determined that the installed cable is similar to the specimens tested.

2. GPU should document in the file an aging calculation, using information from the test report, that establishes a qualified life for the cable.

Kerite Cable ✓

TER Item No. 106

Same two comments made for Continental Wire and Cable Co. Cable.

Square D Diode ✓

Model JTXIN6071A, TER Item No. 116

1. EQ documentation currently in the file is not adequate to demonstrate qualification. However, these diodes are associated with ASCO DC solenoid valves and, according to GPU, there are no such valves associated with the EFW system that are required to be environmentally qualified. Therefore, these diodes would not be required to be demonstrated qualified. GPU should document the basis upon which these diodes are exempted from being qualified, and evaluate whether there are any DC solenoid valves and associated diodes in a harsh environment area that are required to be qualified. If so, GPU should notify the NRC prior to restart.

States Terminal Block ✓

Model NT, TER Item No. 110

1. The file should document the specific equipment associated with these terminal blocks, and GPU must determine whether the IR readings documented in the test report are acceptable for the application(s) of these terminal blocks.

Foxboro Transmitters ✓

FT-791, 779, 782 & 788, Model NE 13DM, TER Item No. (None)

1. The EQ documentation, WYLE Test Report 45592-4, states that the end user must address specific accuracy requirements for each application and evaluate total loop error. GPU must document such an evaluation using the demonstrated accuracies from the test report.

2. Other than SCEW sheets indicating 23.62 years, the file contains no assessment of qualified life by GPU. The file should document GPU's qualified life determination.
3. The transmitters were tested with interfaces as described in the test reports, e.g., with a Conax electrical conductor seal assembly with integral electrical junction box, flexible conduit with holes drilled in it, etc. The file should document that the transmitters in TMI-1 are either installed as tested, or a description of their installation provided and the applicability of the test report to their installed condition justified.
4. Part of the test sequence is seismic qualification. GPU should document that the seismic testing performed is applicable to TMI-1.
5. On page IX-22 of the test report it is stated that a formal report will be issued to answer anomaly NOA F37. Similarly, on page X-25 it is stated that justification for a test interruption, anomaly NCA F42, will be provided in the final test report. Until the formal report addressing NOA F37 and the final test report addressing NOA F42 are reviewed by GPU and placed in the file, GPU should document its evaluation of the anomalies and their effect on the qualification of the transmitters.

Foxboro Transmitters (Not associated with EFW System)

RC3A-PT3 & 4, RC3B-PT3, Model E11GH, TER Item No. 78
PT-282, 285 & 288, Model E11AM, TER Item No. 79
SP6A-PT1&2, SP6E-PT1&2, Model E11GM, TER Item No. 81

1. The EQ documentation reviewed does not resolve the deficiencies identified in the TER for these transmitters. However, the SCEW sheets now reference the WYLE Test Report 45592-4, being used by GPU to establish qualification of transmitters FT-791, 779, 782 and 788 (Model NE13DM). GPU stated that the WYLE report is referenced only to address aging and qualified life for these E11 models. In order to resolve all the deficiencies for these transmitters, including aging and qualified life, GPU should determine the applicability of the WYLE report for qualifying these transmitters. Regardless of whether the WYLE report is used, GPU should document in the file the resolution of the TER deficiencies. If it is determined that the WYLE report can be used, the following comments are applicable in addition to those above for the Model NE13DM transmitters.
2. The file should document that the normal radiation simulated in the testing is applicable to the TMI-1 transmitters.

3. On page iii it is stated that additional testing is being performed by the manufacturer to extend the accident radiation qualification and to confirm the aging analysis for the silicone capsule O-rings of transmitters represented by test specimen F-1 (Model NE11). GPU should document whether the testing completed thus far adequately addresses aging for these transmitters since additional testing appears to be necessary. If it is determined that the results of the additional testing are needed to confirm the aging analysis, then GPU should review the test results and place them in the file when they become available.

4. On page I-7 it is stated that Foxboro Report No. PER-81-106 provides justification for qualification of untested transmitters by similarity to those tested. Also, page I-171 refers to Foxboro document QOAAAC012 for similarity information. GPU should procure these documents, review them, and place them in the file to address similarity and substantiate the applicability of the WYLE report for these transmitters, particularly to Model E11AM.