

10/15/84

## C.C. Audit

- BG+E response to RAI states JCO outstanding for three items (See SER). However, BG+E states that some replacement equipment (VALCOR) TER Item no. 95) has not been claimed to be qualified because of completion of paperwork (as-built) - yet no JCO stated needed for this equipment in response to RAI. To complicate things, licensee says that equip. to be replaced is qualified! They can't get any spare parts, so they decided to replace it - Response to TER deficiency (5/17/84) does not state this! \* Documentation in file for Drosen says not qualified!
- Licensee states terminal blocks inside CTMT (TER # 52) are qualified, yet issued FCR to replace them for instrumentation circuits! (Thought to be qualified at time of response.)

~~Bartons to replace TER # 41 again, qualification paperwork not complete~~

8507130430 850524  
PDR FOIA  
CURRAN85-A-26 PDR

- TB 0001 (QMS)
- first p. of Qual. Report Review Summary states blown fuses have no significance.
  - \* 2nd p. 8 references a Franklin report - for what?
  - JCEV 3110F
  - Several inconsistencies, incomplete documentation, no clear conclusion that BG+E has concluded equip. is qualified, or boxes.

(Item no. 58)

C.C. File TB0001 - Marathon Terminal Block,  
1600 Series

dated 10/15/84

- \* SCEW sheet <sup>dated 10/15/84</sup> states, operating time required and demonstrated are NA WYLE report cited 17 day, required
- ✓ - No test reports - brought in later
- SCEW sheet shows qualified for chem. spray to 0.30 % B/A. WYLE ~~summary~~ report no. 17467-TB0001, 10/18/82, Rev. B, says, tested to 2000 ppm boron or boric acid, (Not big concern). Page 2 of qual. ~~eval.~~ <sup>report</sup> ~~summary~~ <sup>review</sup> identifies 3000 ppm & references Limitorgue
- \* - p. 18 of WYLE report states Alex Marion said terminal blocks carry both power and instrumentation. File contains no documentation identifying application of terminal blocks
- p. 16 of WYLE report states BG&E is procuring Conax penetrations (seals) to be installed on junction boxes. - I assume this was never done - holes were to be drilled in bottom. Were they drilled?
- ~~p. 3~~ p. 17 of WYLE report (evaluation) references WYLE <sup>test</sup> report. Qual. Report Review Summary cites Limitorgue Report. Which is ~~not~~ being relied on - both?

10/16

- QRRS, p. 2, cites thermal aging performed as reported in Limitorgue Report B0119, "Qual. Type Test Report of Multi-Point Terminal Strips For Use in Limitorgue Valve Actuators for PWR Service", 7/1/82. p. 3 cites different times & temps., but references same Limitorgue report & WYLE report 17467-TB0001. That WYLE report is an evaluation of WYLE report 45611-1, dated 2/24/82. Test report itself must be in files (BGE) if it is relied on, or BGE must evaluate it, report results, & arrange to have it available to them for the life of the equipment.
- Limitorgue report qualifies terminal strip for use with actuator, not with instrumentation
- pgs. 4 & 5 of <sup>QRRS</sup> cite data from WYLE report 45603-1 - what is this report being used for?
- p. 5 of QRRS says, ~~test~~ method was simultaneous ~~test~~ - not accurate; test was sequential
- p. 6 of QRRS indicates WYLE test report 45603-1 was evaluated with regard to

evaluating mounting & orientation

- Missing BG+E evaluation of anomalies - does licensee agree with disposition?

- \* - <sup>verbally</sup> ~~stated~~ <sup>stating</sup> ~~that~~ <sup>that</sup> terminal blocks to be ~~being~~ replaced by splices for instrumentation circuits - SCOs? Extension request?  
If qualified, where is supporting documentation?  
- They are not claiming qualified for instrumentation

PT0001 Fischer & Porter Co.  
TER Item no. 38  
IPT4008 & IPT3991

- As a result of questioning the environment to which these transmitters could be exposed to, BG+E responded that it was not yet well defined & could be more severe than 'just' radiation. Licensee took another look and verbally stated they have now been determined to be out of scope of 50.49.

10/17/84

C.C. AuditSV0014 ASCO NP8316A75E~~Wyle states qual. report is not valid~~ X

- Wyle evaluation, 17467-SV0014, 7/29/82  
evaluates qual. of above model, however  
field walkdown verified model no. as  
NP8316A75V

- Qual. report evaluated <sup>by Wyle was</sup> ASCO report  
AQR-67368/Rev. 0, 3/82
- ASCO report ~~identifies~~ states  
NP8316A75V is qualified only to  
levels of previous ASCO qual. program  
(ASCO report AQS-21678/TR, Rev. A)  
only for those applications where  
valves are not required to shift position  
following exposure to gamma doses in  
excess of 20 megarads.
- SCEW sheet for this valve identifies  
it as NP8316A75V, but references  
3/82 ASCO report as qualifying this  
valve to 448°F + 182 megarads.
- Required radiation from SCEW sheet  
is 100 megarads, temp. is 296°F.

- SCEW sheet identifies required operating time of 9 hrs. What is basis?
- Need SV0028 for BG+E' evaluation of ASCO report
- p. 18 of WYLE report 17467-SV0028 shows req'd radiation of 100 megarads  
(NP 8720A185V)
- rad. qual. of this valve (& apparently, all other with Viton) is based on length of time required to operate (e.g., ~~9 hrs~~ 17 days) such that 20 megarads will not be exceeded.
- No clear determination of replacement intervals for components
- File just not auditable

Generic concern: No limit switches in EQ program. BG+E says letter to NRC in 1979 & no reply. Q committee just this year (summer '84) <sup>decided</sup> that limit switches are ~~qualified~~ safety-related. They will be included in EQ program. In the process of replacing.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

*La Grange*

**DRAFT**

Docket No. 50-317

Baltimore Gas and Electric Company  
ATTN: Mr. A. E. Lundvall, Jr.  
Vice President - Supply  
Charles Center  
Post Office Box 1475  
Baltimore, Maryland 21203

Gentlemen:

SUBJECT: INSPECTION NO. 50-317/84-27

This refers to the special team inspection conducted by Mr. G. T. Hubbard of this office on October 15-19, 1984, at the Baltimore Gas and Electric Company (BG&E) headquarters, Baltimore, Maryland, and Calvert Cliffs Nuclear Power Plant, Unit 1, Lusby, Maryland, of activities authorized by NRC License No. DPR-53 and to the discussions of the team's findings with Mr. R. F. Ash and other members of your staff at the conclusion of the inspection. The inspection reviewed your efforts to comply with the requirements of 10 CFR 50.49 to implement a program for establishing and maintaining the qualification of electric equipment within the scope of ~~Section 2(b) of~~ 10 CFR 50.49. The inspection also included evaluations of the implementation of equipment qualification corrective action commitments made as a result of the December 16, 1982, Safety Evaluation Report and the October 13, 1982, Franklin Research Center Technical Evaluation Report (TER). Within this area, the inspection consisted of selected examinations of procedures and representative records, interviews with personnel, and observations by the inspectors. X ✓

This inspection identified significant deficiencies in your implementation of the requirements of 10 CFR 50.49 and your committed actions to resolve the deficiencies identified in the SER/TER. Although we are concerned about the serious nature of these deficiencies, no enforcement action will be taken at this time since Unit 1 is not legally required to be in full compliance with 10 CFR 50.49 until March 31, 1985 or the next refueling outage, whichever occurs first. However, we strongly urge that you carefully review these findings and take appropriate corrective action so as to achieve full compliance with equipment-qualification requirements prior to the March 1985 deadline. In considering your corrective actions, particular emphasis should be given to assuring

adequate management and Quality Assurance involvement in this important activity. Your actions relative to these findings will be reviewed during a future inspection, which will also reassess your compliance with 10 CFR 50.49 requirements and verify that all committed actions to resolve SER/TER deficiencies have been completed.

We will gladly discuss any question you have concerning this inspection.

Sincerely,

Gary G. Zech, Chief  
Vendor Program Branch  
Division of Quality Assurance, Safeguards,  
and Inspection Programs  
Office of Inspection and Enforcement

Enclosure:  
As stated

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Enclosure:  
As stated

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12/ /84	12/ /84	12/ /84	12/ /84	12/ /84	12/ /84

U.S. Nuclear Regulatory Commission  
Office of Inspection and Enforcement

Report No. 50-317/84-27

Docket No. 50-317

License No. DPR-53

Licensee: Baltimore Gas and Electric Company  
Charles Center  
Post Office Box 1475  
Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Nuclear Power Plant, Unit 1

Inspection At: Baltimore and Lusby, Maryland

Inspection Conducted: October 15-19, 1984

Inspectors:

G. T. Hubbard, Equipment Qualification and  
Test Engineer

Date

Also participating in the inspection and contributing to the  
report were:

U. Potapovs, Chief, Equipment Qualification Inspection  
Section, I&E

N. B. Le, Engineer, I&E

R. G. LaGrange, Section Leader, NRR

R. O. Karsch, Reactor Engineer, NRR

M. W. Yost, Consultant Engineer, Idaho National  
Engineering Laboratory

A. Finkel, Lead Reactor Engineer, R1

L. Cheung, Reactor Engineer, R1

D. Trimble, Resident Inspector, R1

E. H. Richards, Technical Consultant, Sandia  
National Laboratory

Approved by:

G. G. Zech, Chief, Vendor Program Branch, I&E

Date

## INSPECTION SUMMARY:

Inspection on October 15-19, 1984 (Inspection Report No. 50-317/84-27)

Areas Inspected: Special, announced inspection to review the licensee's implementation of a program per the requirements of 10 CFR 50.49 for establishing and maintaining the qualification of electric equipment within the scope of ~~Section 2(b)~~ of 10 CFR 50.49. The inspection also included evaluations of the implementation of equipment qualification (EQ) corrective action commitments made as a result of deficiencies identified in the December 16, 1982, Safety Evaluation Report (SER) and the October 13, 1982, Franklin Research Center (FRC) Technical Evaluation Report (TER). The inspection involved 289 inspector hours onsite.

RESULTS: The inspection identified seven areas of significant deficiencies relative to the compliance with 10 CFR 50.49 requirements: (1) qualification files not auditable - Paragraph 4.A.(1)(a); (2) inadequate control and storage of qualification files - Paragraph 4.A.(1)(b); (3) inadequate written documentation and implementation of requirements and/or procedures for compliance to 10 CFR 50.49 - Paragraph 4.A.(2)(a); (4) no maintenance program which includes activities necessary to maintain the qualified status of qualified equipment - Paragraph 4.A.(4); ~~(5) lack of sufficient documentation to enable the NRC to determine that overall EQ program met the requirements of 10 CFR 50.49 - Paragraph 4.A.;~~ (6) lack of sufficient information to allow the NRC to determine that SER/TER commitments had been implemented - Paragraph 4.B.; and ~~(7)~~ inadequate and inaccurate qualification data files - Paragraph 4.D.

## Details

### 1. Persons Contacted

#### 1.1 Baltimore Gas and Electric Company (BG&E)

- \*K. Sebra, Principal Engineer
- \*B. Montgomery, Engineer
- \*A. Marion, Senior Engineer
- \*A. Anuje, Supervisor, Quality Assurance (QA)
- M. Eye, QA Auditor
- B. Daschbach, Associate Engineer
- S. Parr, Engineering Technician
- R. Branch, Engineer
- \*L. Dudek, Supervisor, Engineering QA
- \*R. Olson, Principal Engineer
- \*L. Basso, Engineering Analyst
- R. Sydnor, Supervisor, Electrical and Controls (E&C)
- J. Moreira, General Supervisor, E&C Section
- \*R. Ash, Supervising Engineering
- \*S. Parks, General Supervisor

#### 1.2 BG&E Contractors

- \*R. Bell, Engineer, Bechtel Power Corporation - Gaithersburg, Md.

#### 1.3 Nuclear Regulatory Commission

- \*C. Anderson, Chief, Plant Systems Section, R1
- V. Noonan, Chief, Equipment Qualification (EQ) Branch, NRR
- \*G. Zech, Chief, Vendor Program Branch, I&E
- \*J. Partlow, Deputy Division Director, DQASIP, I&E

### 2. PURPOSE

The purpose of this inspection was twofold. One purpose was to review the licensee's implementation of the requirements of 10 CFR 50.49 and his committed actions for SER/TER identified deficiencies. The other purpose was to utilize the inspection as a pilot inspection to evaluate a preliminary version of a 10 CFR 50.49 inspection module being developed for NRC regional office use for inspections of licensees' EQ programs. Only the findings relative to the licensee's activities are discussed in this report.

\*Denotes those present at the exit interview on October 19, 1984

### 3. BACKGROUND

On March 16, 1984, the NRC held a meeting with BG&E officials to discuss BG&E's proposed methods to resolve the EQ deficiencies identified in the December 16, 1982 SER and October 13, 1982 FRC TER. Discussions also included BG&E's general methodology for compliance with 10 CFR 50.49 and justification for continued operation for those equipment items for which environmental qualification was not completed. The minutes of the meeting and proposed method of resolution for each of the EQ deficiencies were documented in May 14 and July 9, 1984, submittals from the licensee. The TER and the May 14 and July 9 submittals were reviewed by the inspection team members and were used to establish a status baseline for the inspection.

Since Calvert Cliffs Nuclear Power Plant (CCNPP), Unit 1 is not legally required to be in full compliance with 10 CFR 50.49 until March 31, 1985, or the next refueling outage, whichever occurs first, and the inspection was scheduled as a pilot inspection to evaluate a preliminary 10 CFR 50.49 inspection module being developed, no enforcement action is being taken regarding the findings identified during this inspection. However, the licensee is expected to carefully review these findings and take appropriate corrective action so as to achieve full compliance with 10 CFR 50.49 requirements prior to the March 1985 deadline.

### 4. FINDINGS

#### A. EQ Program Compliance with 10 CFR 50.49

The NRC inspectors examined the licensee's EQ program for establishing the qualification of electric equipment within the scope of ~~Section 2(b) of 10 CFR 50.49~~. The program was evaluated by examination of the licensee's qualification documentation files, examination of procedures which control the licensee's EQ efforts, verifying the adequacy and accuracy of the licensee's 10 CFR 50.49 equipment list, and examination of the licensee's program for maintaining the qualified status of the covered electrical equipment. ~~Based on the inspection findings, which are discussed in more detail below, and the fact that BG&E is still not fully implementing its EQ program, the team was unable to determine that the licensee's program meets the requirements of 10 CFR 50.49.~~

#### (1) Qualification Files, General

- (a) The NRC inspectors review and evaluation of 16 qualification files determined that the files were not auditable as required by ~~Section 2(j)~~ of 10 CFR 50.49. Further definition of auditability is provided in Section 3 of IEEE-323-1971 and 1974 which describes auditable data as information which is documented and organized so as to be readily understandable and traceable to permit independent verification of inferences or conclusions based on the information. Of the 16 files examined only two files were found to be detailed

enough so that the inspectors could independently verify BG&E's conclusions. However, each of these files did have several discrepancies (see paragraphs 4.D.(7) and (14)). The documentation and detail in the 14 other files was such that ready understanding of what data, evaluations, and conclusions were documented required a great deal of assistance by BG&E personnel (see discussions in paragraph 4.D. for detailed findings concerning each file reviewed). The files did not clearly document that evaluations and analysis had been performed regarding specified performance requirements and demonstrated qualified life, or whether or not equipment qualification had actually been determined by BG&E. In some cases where supporting data was referenced to support the qualification files, there was no method in the file to indicate where the referenced data was located. In other cases, when questions were raised concerning analysis or documentation, documents were generated during the inspection to justify BG&E's position regarding qualification of the item.

In addition, Electrical Engineering Department Procedure No. 18 (EEDP-18), "Equipment Qualification," dated August 6, 1984, requires the use of Qualification Evaluation Worksheets (QEWs), Qualification Report Review Summary (QRRS) sheets, and Qualification Maintenance Summary (QMS) sheets for the evaluation of equipment qualification. The inspectors found that the QEWs and QRRS sheets were not always adequately completed and in at least one case they were not in the files. QMS sheets also were not in the files (see discussion in paragraph 4.A.(2)(a)).

The NRC will evaluate the auditability of the licensee's qualification files during a future inspection (50-317/84-27-01).

- (b) An inspection of the electrical equipment qualification files by the inspector identified that the records were not controlled and stored as described in ANSI N45.2.9, 1974, titled "Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants." An internal audit conducted by BG&E QA from September 12-October 9, 1984, identified similar findings in this area. The audit report, No. 84-24-01, for this internal audit

had been typed and was in the process of being issued during this inspection.

The NRC will review the licensee's action relative to the internal audit findings during a future inspection (50-317/84-27-02).

(2) EQ Program Procedures

- (a) The NRC inspector examined procedure EEDP-18 which provides guidelines for the uniform assessment, evaluation, review, and implementation of activities associated with environmental and seismic qualification of Class 1E equipment for CCNPP. This procedure describes activities to be performed by the electrical engineering department (EED) as well as describing inputs required by other BG&E departments necessary to support the EED evaluations of the EQ program. The inspector's review determined that the other departments defined in EEDP-18 to support EED have not implemented requirements and/or procedures that would provide the necessary data to support the criteria of EEDP-18. As of this inspection, the Nuclear Power Department (NPD) had no specific internal requirement to provide the QMS sheets to EED and, in fact, no completed sheets had been provided to EED. Without the type of data that is listed in the QMS sheets, EED cannot identify whether or not the installed safety-related equipment is being maintained in a qualified condition. (Additional information on maintainance is discussed in paragraph 4.A.(4)). Lack of written documentation and implementation of procedures for compliance to 10 CFR 50.49 requirements by various licensee departments was identified as an area of concern relative to BG&E's effective implementation of a 10 CFR 50.49 program.

This item will be evaluated during a future inspection (50-317/84-27-03).

- (b) The NRC inspector's review of procedures determined that the "as-built" EQ status that is maintained by the EED qualification group has a built-in-delay of a minimum of five months before verification of the "as-built" design can be made. Discussions with BG&E personnel and examples identified in qualification files indicated that this delay can extend even longer, to a year or more. When a site modification is desired on a piece of qualified electrical equipment, the EED qualification group will issue a facility change request (FCR) for the modification; however, the FCR is not closed until the "as-built" drawings have been completed and then reviewed by the EED qualification group. The EQ engineer reviews the "as-built" drawings to establish the actual installation of the modification and to establish the qualification of the modified equipment in the "as-built" condition. If the "as-built" condition is acceptable to

allow qualification of the equipment, then the EQ engineer will close out the FCR and update the 10 CFR 50.49 listing to include the modification design data. The inspector found this delay to be of concern, since a modified or new piece of equipment could be utilized in a safety-related application for a significant period of time during which its qualification would not have been established nor would it have been included on the 10 CFR 50.49 list.

This area of concern will be reviewed during a future NRC inspection (50-317/84-27-04).

(3) 10 CFR 50.49 List:

The licensee is required to maintain a list of the equipment necessary to bring the plant to hot shutdown in case of an accident. BG&E has three written procedures dealing with the list now in use. Quality Assurance Procedure No. 28 (QAP-28) controls items covered by the QA program and EEDP-4 and 18 govern equipment requiring qualification and control of the list of safety-related equipment. The inspector's examination of the above procedures and discussions with BG&E personnel determined that while these procedures control BG&E's "Q" list of safety-related items and a Class 1E list which is a sublist of the "Q" list, BG&E does not have any formal documented procedures that control the list of items which specifically fall within the scope of 10 CFR 50.49.

The NRC inspector, however, did verify, by two different methods, the completeness of the 10 CFR 50.49 list. First, the licensee was requested to present a "walk-through" to demonstrate how the list is derived using an example system. Two examples of safety and non-safety-related equipment, which should have been on the list, were checked and both were on the list. Secondly, the inspector selected eight representative items from various systems. All selected items were either on the list or a satisfactory explanation was provided justifying their omission from the list. The licensee has developed an equipment data base utilizing a digital computer on which the 10 CFR 50.49 list is maintained. The use of this system greatly facilitated the audit and verification of the equipment list. On the basis of the sample audit no deficiencies were identified in the equipment list.

(4) EQ Maintenance Program:

The NRC inspector reviewed site procedure CCI-211 which described plant preventative maintenance requirements. The maintenance criteria contained in this documentation was generated from construction maintenance records, vendor data, and maintenance manuals. To assure that ~~qualified~~ maintenance records are updated with the information developed by the EED qualification group, BG&E is planning to generate QMS sheets as described in EEDP-18. These QMS sheets will be prepared by the Qualification Maintenance Program (QMP) Working committee. This committee would have the task of assuring that QMS sheets provide the technical data and schedules to maintain the safety-related equipment in a qualified status. At the time of this inspection the task of filling out the QMS sheets had not started. X

In addition to the QMS sheets, BG&E has identified other tasks that are required in a maintenance program that would be necessary to assure qualified electrical equipment is being maintained in a qualified status. These tasks identified by the working committee are:

- Plan for new and replacement equipment
- Plan for piece part and material replacement
- Maintain selected <sup>instrumentation</sup> systems or portion thereof [piping and ~~installation~~ drawings (P&IDs), schematics, parts lists, etc.] in an updated status X ✓
- Verify that NRC Bulletins/Information Notices concerning environmentally qualified equipment have been addressed

The E&C section of NPD in a letter dated September 27, 1984 drafted a proposed plan to establish an overall maintenance program ~~that would comply with the intent of 10 CFR 50.49.~~ The scope of the letter was similar to the presentation made by BG&E to the NRC in their March 16, 1984 meeting at Bethesda, Maryland. As of this inspection, the only part of the letter that has been implemented is the establishment of the QMP working committee. In reviewing the task assignments and schedules defined in the letter the inspector determined that unless BG&E management approved the outlined program or one similar to it, within a few weeks of this inspection, BG&E would not meet the 10 CFR 50.49 implementation deadline. X ✓

The NRC will evaluate BG&E's activities in the area of qualification maintenance during a future inspection (50-317/84-27-05).

{ to assure that equipment within the scope of 10 CFR 50.49 is maintained in a qualified condition.

Future inspection items 50-317/84-27-01 through 05 will also be evaluated collectively to determine BG&E's overall compliance with the requirements of 10 CFR 50.49 (50-317/84-27-06).

B. SER/TER Commitments

The NRC inspectors evaluated the implementation of EQ corrective action commitments made as a result of the SER/TER identified deficiencies. The evaluations were based on the premise that all corrective action commitments had been completed as indicated in BG&E letter to H. R. Denton, NRR, dated May 14, 1984. This letter stated that environmental qualification of safety-related equipment was essentially complete. Based on the evaluations conducted, the NRC inspectors were unable to determine that SER/TER deficiencies had been adequately resolved.

Reasons supporting the above finding include:

- (1) Determination by inspectors that 14 of 16 qualification files were not auditable (see discussions of paragraph 4.A.(1)(a)).
- (2) The existence of conflicting and confusing data in the qualification files. The Dragon solenoid valve file, TER item 95, was particularly confusing in the fact that one document in the file indicated the valve was not qualified while another document indicated it was, if heat shrink sleeves had been installed on valve wiring. The Dragon file also had conflicting data as to what solenoid valve types and configurations were actually installed in the plant. (See paragraph 4.D. for detailed discussions on Dragon valves and other TER item files reviewed.)
- (3) The lack of insulation material data in the qualification file for Allis Chalmers motor, TER item 47. This data is needed so that irradiation effects on motor insulation materials can be evaluated to establish qualification. Enclosure 2 to the BG&E letter of May 14, 1984 stated that the motor was qualified and documentation was available. BG&E stated during the inspection that the required data from Allis Chalmers had not been received, but BG&E considered the motor "qualifiable" due to experience with other qualified motors. (See paragraph 4.D.(9) for detailed discussion on this motor.)
- (4) The inspectors' identification of System Component Evaluation Worksheets (SCEW) discrepancies such as operating time requirements being identified as nine hours when it should have been 17 days and qualification operating time requirements being identified as "Not Applicable" when it should have been at least 17 days. (See paragraph 4.D. for specific identification of instances of these discrepancies.)
- (5) The inspectors' identification of five technical issues which were not addressed in the documentation establishing the qualified life of TER item 42, Amphenol electrical penetration assemblies

(EPAs). Enclosure 2 of BG&E letter of May 14, 1984, stated that the qualified life had been established. (See paragraph 4.D.(7) for detailed discussion of this TER item.)

The above items led the NRC inspectors to the conclusion that BG&E had not performed adequate reviews and analysis to assure correction of SER/TER deficiencies and/or had not adequately documented the reviews and analysis in a manner readily auditable and acceptable to the NRC. Until adequate analysis and/or documentation is performed by BG&E the NRC is unable to determine if SER/TER commitments have been completed.

BG&E's implementation of SER/TER commitments will be evaluated during a future inspection (50-317/84-27-07).

### C. Plant Physical Inspection

As part of this EQ inspection, the NRC inspectors conducted an inspection on October 18, 1984, at the CCNPP, Unit 1 site at Lusby, Maryland. Of 16 components that were reviewed by the inspectors at the corporate offices in Baltimore, Maryland, TER items 10, 19, 43, 47, and 95 were selected for inspection verification. The five items, which were all outside of containment were inspected for: (1) manufacturer and model number; (2) location, interfaces, and mounting configuration; (3) condition of installed item; (4) environmental conditions of location; and (5) physical separation. The information gathered during the plant inspection was compared to documentation reviewed at the corporate offices to verify the accuracy of the documentation. The following equipment items were inspected:

- (1) Main steam isolation valve (MSIV) pilot solenoid valves (ISV4042-46) located in piping area (A224), TER Item 10, Republic/Teledyne.
- (2) Feedwater isolation valve (2MOV4517) located in the main steam piping penetration room (A315), TER Item 19, Limitorque.
- (3) Low pressure safety injection (LPSI) pump motors (1MA104) located in the emergency core cooling system (ECCS) pump room (A119), TER Item 43, General Electric.
- (4) Containment spray pump motors (1MA107 and 1MA407) located in the ECCS pump room (A119), TER Item 47, Allis Chalmers.
- (5) Hydrogen analyzer solenoid valves (1SV6507A thru G) located in the west penetration room (A221), TER Item 95, Dragon.

The model number on item (2) above could not be verified because of extremely high temperature and nameplate location. The type and model numbers could not be verified for item (5) without scaffolding, therefore these items were not verified. No deficiencies were identified by the inspectors during the plant tour.

Should be expanded to say that the high normal operating temperature should be used for aging evaluations for equipment in that area - replacement intervals should be determined based on the higher ambient temperature. Will be evaluated (EQ documentation) during future inspection.

D. Detailed Review of Documentation File

The NRC inspection team examined BG&E's qualification documentation files for the items discussed in the following paragraphs to verify the adequacy and accuracy of the files in establishing the qualified status of electrical equipment within the scope of 10 CFR 50.49.

- (1) The inspector's review and examination of qualification file SV0013 for the Republic/Teledyne MSIV pilot solenoid valves, TER item 10, determined the file did not contain sufficient documents to determine the adequacy of the qualification. Enclosure 2 to the May 14, 1984, BG&E letter had stated that the valve was qualified and documentation was available. The inspector's review of the SCEW sheets for these valves indicated that the required operating time, the qualified operating time, the qualified relative humidity, and aging parameters were all identified as "Not Applicable" (NA) or "Not Required" (NR); however, there was no documented evaluation supporting this position.
- (2) The inspector's review and evaluation of qualification file MOV015 for the Pratt motor operated valve (MOV), TER item 15, identified some questions regarding the file; however, when these questions were presented to BG&E, BG&E determined that the Pratt MOV was no longer in the scope of 10 CFR 50.49. Enclosure 1 to the May 14, 1984 BG&E letter indicated that the valve might be removed from the scope of the rule; however, it was not identified to be removed until the inspector raised questions concerning its qualification. BG&E said the valve would be removed from the scope of the rule because P&ID No. 60-248-E, M-65, Revision 6, identified that the valve is in the non-safety-related portion of the hydrogen purge system.
- (3) The inspector's review and evaluation of qualification file MOV002 for the Limitorque MOV, TER item 19, determined that Limitorque report No. B0058 and Wyle Laboratories report No. 17467, Revision A, were in the file to correct SER/TER identified deficiencies. While there was no documentation in the file which provided traceability to what specific data in the reports was used to satisfy SER/TER deficiencies relative to similarity, aging degradation, and qualified life of the valve, the inspector determined that the reports were adequate to satisfy the deficiencies.
- (4) The inspector's review and evaluation of qualification file MOV001 for the Limitorque MOV, TER item 27, identified the same concerns discussed under paragraph 4.D.(3) above.

- (5) The inspector's review and evaluation of qualification file PT0001 for Fischer and Porter pressure transmitter, TER item 38, identified questions regarding the environment to which these transmitters could be exposed. BG&E initially responded that the environment was not yet well defined and could be more severe than just a radiation environment; however, after taking a further look at the environment, BG&E verbally told the inspector that these transmitters have now been determined to be out-of-scope of 10 CFR 50.49. The inspector took no exception to the deletion of the transmitter from the 10 CFR 50.49 list.
- (6) The inspector reviewed qualification file PT0001 for Fischer and Porter pressure transmitters, TER item 41, to verify that commitments regarding the TER identified deficiency had been implemented. The inspector's review determined that FCR-81-1000 had corrected the deficiency by requiring the transmitters to be replaced with model 763 Barton transmitters.
- (7) The inspector's review and evaluation of qualification files EPA001-006 for Amphenol EPAs, TER item 42, identified five areas of concern which were not addressed in the file documentation. These concerns are:
  - (a) Calculated life of BUNA-N gaskets was 0.6 years; however, BG&E stated that operating experience shows BUNA-N has a much longer life. No supporting data or references were provided in the qualification file to justify a qualified life beyond 0.6 years, nor were any maintenance/surveillance requirements established which could assure an operational life beyond 0.6 years.
  - (b) Surveillance of gasket materials was specified in qualification files EPA004-006; however, no information was provided concerning the frequency of inspection or what the inspector or maintenance personnel should look for.
  - (c) Similarity between the qualified EPAs and the EPAs actually tested was not adequately addressed in the qualification files.
  - (d) Self-heating of the conductors and the effect on aging of materials in the EPAs was not adequately addressed in the files.
  - (e) Test failures were not adequately addressed in the files.

- (8) The inspectors' review and evaluation of qualification file MTR004 for the General Electric motor, TER item 43, identified the following discrepancies in the documentation:
- (a) SCEW sheets indicated that the required operating time was nine hours; however, Wyle report No. 17467-MTR004, Revision A and BG&E's QEW indicated the required operating time was 17 days. The SCEW sheets also showed the qualified operating time as NA, which did not meet the above requirement. The Wyle report did show the qualified life to be greater than 17 days.
  - (b) The above Wyle report identified that the material most sensitive to radiation used in the subject motors is BUNA-N, which has a radiation service limit of  $4 \times 10^6$  rads. The SCEW sheet identified the qualified radiation of the motor to be  $10 \times 10^6$  rads. However, the inspector found the required radiation level to be only  $3.8 \times 10^6$  rads.
  - (c) The Wyle report recommended that the BUNA-N in the motors should be replaced at an interval of 4.9 years or less. SCEW sheet data indicated that BG&E did not agree with the 4.9 year replacement interval and this was verbally confirmed by the inspector; however, there was no documentation in the file to justify a longer replacement time interval.
- (9) The inspector's review and evaluation of qualification file MTR006 for Allis Chalmers motors, TER item 47, determined that the motor had not been qualified as stated in Enclosure 2 to the May 14, 1984 BG&E letter. The enclosure stated that the equipment was qualified and documentation was available. During the inspection BG&E verbally stated that they considered the motor to be "qualifiable" based on past operating experience, but they had not received the list of materials for the motor that they needed to complete their qualification evaluation for a specified harsh radiation environment of  $3.873 \times 10^6$  rads. Other necessary data, identified by the inspector as not being in the file included:
- (a) Qualification Report Review Summary
  - (b) Qualification Evaluation Worksheets
  - (c) Operability time
  - (d) Qualified life
  - (c) Necessary maintenance to preserve a qualified status

(10) The inspector's review and evaluation of qualification file TB0001 for Marathon terminal blocks, TER item 58, identified a number of instances where the data in the file was confusing and/or conflicting with other data in the file. Examples of these instances are:

- (a) The SCEW sheet, dated October 15, 1984, states the operating time required and demonstrated are NA; whereas, Wyle report 17467-TB0001, Revision B, dated October 18, 1982, cites a required operating time of 17 days.
- (b) Page 18 of the Wyle report quotes A. Marion, BG&E Senior Engineer, as saying the terminal blocks carry both power and instrumentation loads. The file contains no documentation that identifies the actual application of the terminal blocks.
- (c) Wyle report 17467-TB0001 is an evaluation of Wyle test report 45611-1, dated February 24, 1982, for BG&E's applications; however, the test report was not in the files. If BG&E is relying on this test report to justify qualification, then it should be in the files or BG&E should evaluate it, document the evaluation results, and arrange to have the report available to them for the life of the equipment.
- (d) Pages 4 and 5 of QRRS cite data from Wyle test report 45603-1, but it is not clear as to how the report is being used to support qualification.
- (e) Test anomalies were identified in the file; however, there were no BG&E evaluations of the anomalies to see if they agreed with the test labs disposition or what affect the anomalies had on BG&E's actual equipment application.

The inspector also reviewed an internal BG&E letter, dated October 3, 1984, that states an FCR is being prepared to replace terminal blocks in instrumentation circuits by qualified splices. (See discussion in paragraph 4.F.(11) on IE Information Notice (IN) 84-47).

(11) The inspector's review and evaluation of qualification file CBL014 for Cerro "FREP/FR" Neoprene cable, TER item 83, identified six areas of concern. These concerns are:

- (a) Similarity between the installed cable and the tested cable was not adequately addressed in the file.
  - (b) Acceptance criteria for cable installed in CCNPP were not given.
  - (c) Qualified life of cable was not adequately addressed.
  - (d) Effect of accident environment on (aged) cable near end of its qualified life was not addressed. Radiation aging and LOCA simulation was done on a new cable, not a cable near the end of its qualified life. No justification or analysis for this was provided in the file.
  - (e) Qualification was based on a test report identified in the referenced inspection reports of IE IN 84-44 as not having supporting test data to allow the report to be audited.
  - (f) The file was not auditable to the extent that constant assistance from the BG&E engineer that had prepared the package was required to evaluate the package. In some instances of question, the engineer had good verbal justification in support of cable qualification; however, he had not documented the justification in the file.
- (12) The inspector's review and evaluation of qualification file CBL015 for BIW coaxial cable, TER item 85, identified three questions concerning the file itself and one technical issue. When the inspector discussed these items with BG&E, they went back and reviewed other documentation they had and determined that this BIW cable was not used in a 10 CFR 50.49 application and therefore qualification was not necessary. BG&E was then asked to check their other coaxial cables to determine what cable was used in 10 CFR 50.49 applications in CCNPP, Unit 1. After a review of data, BG&E also deleted Raychem coaxial cables identified under TER items 77 and 78 from the scope of 10 CFR 50.49 requirements. At the same time BG&E identified Rockbestos coaxial cable, qualification file CBL031, and Brand-Rex coaxial cable, qualification file CBL029, as being used in CCNPP, Unit 1, for applications within the scope of 10 CFR 50.49. The inspector's check of BG&E's 10 CFR 50.49 list identified the Brand-Rex cable as being on the list; however, Rockbestos cable was not on the list. BG&E attributed this fact to the delay time, previously discussed, for FCRs. The

review of the Rockbestos coaxial cable qualification file is discussed in paragraph 4.D.(16) below. The Brand-Rex cable file was not reviewed by the inspector.

- (13) The inspector's review and evaluation of qualification file SV0002 for Dragon solenoid valve, TER item 95, determined that the file was not auditable. Discussions with BG&E personnel clarified, to some degree, the qualification status and the in plant configuration of the valve, which supposedly had been replaced in April 1982 with a qualified Valcor model V526-5295 per a justification for continued operation (JCO) dated February 26, 1982. The plant site inspection on October 18, 1984 verified that the Dragon valves were still in place in the west piping penetration room. Examples of items in the file which led to the determination that the file was not auditable are:

- (a) The file contained no QRRS or QEW.
- (b) The file contained specifications, drawings and manufacturers certificate of compliance, but no qualification reports or analysis.
- (c) A FCR in the file stated that the Dragon valves were not qualified for their intended use and that operability of these valves could not be established to provide post-accident hydrogen sampling capability. This FCR had not been closed out (i.e., no verification that the valves had been replaced).
- (d) Notation on a current SCEW sheet indicated that the Dragon valves had been replaced.
- (e) Records in the file indicated that environmentally qualified Raychem heat shrink sleeves were applied to the valve teflon leads as stated in the referenced JCO. BG&E now considers these valves qualified based on the application of the sleeves. BG&E says the sleeves will assure continued valve operability in the event the teflon leads become degraded as a result of a high radiation post-LOCA environment.
- (f) The file contained no documentation attesting to the qualified states of these valves nor did the file contain evaluations of the sleeves for the service environment or reference any qualification reports for these sleeves.

BG&E verbally said that they do plan to go ahead and replace the Dragon valves with the Valcor valves due to spare parts unavailability. This will be done during the next refueling outage.

- (14) The inspector's review and evaluation of qualification file SV026 for Target Rock (TR) solenoid valves identified the following areas of concern which BG&E should address in their qualification file.
- (a) There was no documentation in the file to show that the licensee had assessed the operability requirements of the installed valves.
  - (b) One test anomaly was documented in TR test report No. 2375, Revision A, dated September 26, 1979; however, BG&E provided no analysis in the file to address the anomaly. The anomaly was described as intermittent operation of one set of contacts on the valve's relay.
  - (c) The above TR report also indicated that all valve internal electrical components have exhibited evidence of wetness and some corrosion evident on the lead junction parts. (The valve was disassembled and inspected.) The wetness and corrosion was attributed to the failure of the cement sealing compound used to seal the test instrumentation wires at the conduit connection. The sealing compound had shrivelled and pulled away during test and allowed borated water to enter the inside of the valve enclosure. BG&E proposed that watertight electrical sealing compound be used at the conduit entrance for TR valves installed at CCNPP, and FCR-81-1001 was issued. There is no indication in the EQ file as to what type of watertight sealing compound was installed and there is no EQ documentation in the file to support qualification of the compound.
  - (d) There was no evidence that the licensee had actually done a walkdown of installed equipment to ensure that all TR valves are installed in accordance with the tested valves' configuration and interfaces.
- (15) The inspector's review and evaluation of qualification file SV0014 for ASCO solenoid valves model NP8316A75E identified a number of instances where the data in the file was either conflicting and/or confusing to the point that it was not clear to the inspector as to what was the basis of qualification. Examples of the conflicting and confusing data are:
- (a) Wyle report 17467-SV0014, dated July 29, 1984, evaluated the qualification of valve model NP8316A75E; however, the final walkdown verified the model number as NP8316A75V.

- (b) ASCO test report AQR-67368, Revision 0, dated March 2, 1982, (this report is the one evaluated in the Wyle report) states that the NP8316A75V valve is only qualified to the levels identified in previous ASCO report AQS-21678/TR, Revision A, dated July 1979, only for those applications where valves are not required to shift position following exposure to gamma radiation doses in excess of 20 megarads. However, SCEW sheet data for the NP8316A75V valve references the March 2, 1982, report and says the valve is qualified to 448°F and 182 megarads, values consistent with the March report and not the earlier July report.
  - (c) The file also contained Wyle report 17467-SV0028 and referenced qualification file SV0028; however, it was not evident from reviewing the SV0014 file how the other data supported qualification of the NP8316A75V model valve. The SV0028 qualification file applies to ASCO model NP8320A185V valves.
  - (d) The file did not clearly document what component replacement intervals were required for the valve.
- (16) The inspector's review and evaluation of qualification file CBL031 for Rockbestos coaxial cable determined that qualification for the cable was based on Rockbestos report #2806 which was one of the reports discussed in the inspection reports referenced in IE IN 84-44. The inspector did evaluate an internal BG&E letter from S. Parr, dated August 30, 1984, concerning the IN; however, sufficient justification to support qualification of the cable, in view of the IN, was not provided. BG&E personnel verbally told the inspector that they were still looking into the matter and they might be able to qualify the cable based on data from the system qualification test for the high range radiation monitoring system (HRRMS). The cable's only 10 CFR 50.49 application at CCNPP is in the HRRMS, which was qualified as a system, including cable.

Based on the above findings, the NRC inspection team determined that the qualification documentation files reviewed were either not auditable or were not adequate and/or accurate enough to establish the qualified status of electrical equipment within the scope of 10 CFR 50.49.

The NRC will review BG&E's qualification documentation files again during a future inspection to determine the files adequacy and accuracy in establishing the qualified status of electrical equipment within the scope of 10 CFR 50.49 (50-317/84-27-08).

E. Use of JCOs

During the course of the inspection questions rose concerning the use of JCOs and/or evaluations which justify useage of unqualified 10 CFR 50.49 equipment during plant operation. Instances when these questions came up were:

1. Discussions concerning BG&E's planned actions to replace Marthon terminal blocks with Raychem qualified splices in instrumentation circuits based on evaluations conducted as a result of IE IN 84-47.
2. Discussions concerning the fact that limit switches were now going to be included in BG&E's EQ program. This decision was made by BG&E's "Q" committee this past summer.
3. Discussions concerning the qualification of Dragon valves as being presently used in the plant today.

Discussions with BG&E focused on whether or not a JCO is required once BG&E makes a determination that some equipment is not qualified or was not within the scope of 10 CFR 50.49, but now is determined to be within the scope. In other words, what documentation is required during the time period installed equipment is identified as needing to be replaced or qualified so that BG&E can continue operation of CCNPP until the installed plant equipment is determined to be fully qualified.

Based on discussions during the inspection and NRR-EQB's representative on the inspection team with a NRC legal representative, the following position was established. Once the licensee makes a determination that some action needs to be taken to quality a piece of equipment installed in a plant, then he needs to evaluate whether or not he should submit a JCO. If he decides that a JCO is not needed then he should, as a minimum, maintain documentation and evaluations which describe why a JCO is not needed and why there is no significant safety hazard in the continued operation of the plant. In addition to the above, it is recommended that the documentation include an updated status concerning the actions being taken to bring the installed equipment to a qualified state. Any evaluations and/or documentation regarding the above should be available for review by the NRC.

F. Information Notice

The NRC inspector reviewed and evaluated BG&E's activities relative to the review of EQ related IE INs/Bulletins. The inspector's review and evaluation included examination of BG&E's records relative to 12 INs and one Bulletin. The inspector's evaluation determined that while procedure CCI-139C requires a plant operating experience assessing committee (POEAC) to review INs, gives the committee chairman the ability to assign required reviews to individual or groups, and requires the committee to review the results, there were no procedural

requirements for the individual reviewer or group to provide review results to the committee. The inspector identified several IN items (see paragraphs 4.F.(2), (7), and (8) for details), which the committee had assigned to individuals and groups for review and where the review results were never provided to the committee for their evaluation. The NRC inspector recommended to BG&E that they evaluate their system to determine if a closed-loop procedure needs to be established to assure adequate review and evaluation of INs.

(1) IN 81-20: Test Failures of Electrical Penetration Assemblies:

The inspector reviewed records that indicated the POEAC had reviewed the content of this IN in its meeting, no. 82-05, and had determined that CCNPP EPAs did not use silicon RTV.

(2) IN 82-03: Environmental Tests of Electrical Terminal Blocks:

The inspector reviewed records which indicated the POEAC had met and reviewed the IN. The review resulted in action item 82-047 as identified in the minutes to meeting no. 84-13. There was no documentation to indicate how this action item was resolved. BG&E verbally told the inspector that procedure E-406 covers the cleanliness requirements for all equipment at CCNPP and that CCNPP maintenance personnel are bound by the requirements of the procedure.

(3) Bulletin 82-04: Deficiencies in Primary Containment EPAs:

The inspector reviewed records that indicated CCNPP has Bunker Ramo EPAs utilizing hard epoxy modules and that they have replaced a number of EPAs (Model 2E Amphenol Sam) with Conax EPAs on FCR 82-148. The inspector also identified that CCNPP has other Bunk Ramo EPAs (Models 2A, 2B, 2C, 2D, 3A, and 3D) but they are not the hard epoxy design.

(4) IN 82-11: Potential Inaccuracies in Wide Range Pressure Instruments Used in Westinghouse Designed Plants:

The inspector reviewed records that indicated POEAC had reviewed this IN and have determined that the identified problem is being addressed by their Nuclear Fuel Management and EQ sections along with ITT Barton instrument uncertainties in compliance with Bulletin 79-01B.

(5) IN 82-52: Equipment Environmental Qualification Testing Experience:

The inspector reviewed records which indicated the POEAC had reviewed the notice and had identified no problems requiring BG&E action. This finding is documented in the minutes of meeting no. 83-02.

(6) IN 83-40: Need to Environmentally Qualify Epoxy Grouts and Sealers:

The inspector reviewed records to indicate that the POEAC had reviewed this notice. Minutes of meeting no. 83-13 documented that the IN was sent to the Principal Engineer, Plant Engineering Nuclear, for information. This issue was assigned to the mechanical representative for further research. BG&E provided documentation (attachement 13 to minutes of POEAC meeting no. 84-07), to show that final disposition had been taken to close out this action item, 83-13-5d.

(7) IN 83-45: EQ Test GE "CK-2940" Switch:

The inspector reviewed records that indicated the POEAC had reviewed this IN and had forwarded it to the Supervisor, Test Equipment for information. This was documented in the minutes of meeting no. 83-14. BG&E had no documentation to indicate what the final disposition of this notice was.

(8) IN 83-72: EQ Testing Experience:

The inspector reviewed records that indicated the POEAC had reviewed this notice and referred it to the engineer in charge of the EQ program. The inspector found no records to show how each item of concern identified in the IN was dispositioned except for ITT Barton transmitters and Limitorque valves. The inspector examined documentation that indicated a plant walk-down was performed to examine all internal components of the Limitorque valves. This walkdown identified a number of parts with undetermined status; however, all were corrected or replaced on FCR-83-1014. The inspector also reviewed data that documented the fact that BG&E had performed the recommended retrofit of Barton transmitters; however, there was no documentation to show how BG&E dispositioned the problems with the zero-base and suppressed-zero model transmitters.

(9) IN 84-23: Results of NRC-Sponsored Tests on ASCO Solenoid Valves:

The inspector reviewed documentation that indicated CCNPP has two ASCO solenoid valves, model NP-8316 and the POEAC had reviewed the notice. The POAEC review was documented in minutes of meeting no. 84-09. The inspector reviewed a letter dated May 31, 1984, to show how the notice was dispositioned; however, this review determined that the licensee's evaluation did not adequately address the staff's concern as was stated in the IN.

(10) IN 84-44: EQ Testing of Rockbestos Cable:

The inspector reviewed documentation that the POEAC had reviewed the notice and minutes of meeting no. 84-17 documented that no further action was considered necessary. The inspector also reviewed a QA surveillance audit at the Rockbestos facility in New Haven, Connecticut, on August 2, 1984. No other records were found to describe what type of action the licensee will take to qualify the Rockbestos/Cerro cables installed at CCNPP, Unit 1 in order to meet the 10 CFR 50.49 deadline. (See discussion in paragraph 4.D.(11) and (16).)

(11) IN 84-47: EQ Tests of Electrical Terminal Blocks:

The inspector reviewed data that indicated the licensee had reviewed the IN. The action taken by the licensee concerning this IN is to change all instrumentation circuit terminal blocks to qualified splices. These changes will be performed on all instrumentation circuits that have the potential of being exposed to loss-of-coolant accidents and main-steam-line breaks.

(12) IN 84-57: Moisture Intrusion in Safety-related Electrical Equipment:

The inspector reviewed documentation that indicated the licensee had reviewed this notice. The inspector's review determined that the licensee feels the concerns raised by the IN have been adequately addressed in the actions performed under FCR-81-1001 and the activities required to be performed by procedure E-406.

(13) IN 84-68: Improperly Rated Field Wiring to Solenoid Valves:

The inspector reviewed records that indicated the licensee had reviewed this notice. The inspector determined that CCNPP has both Valcor and Target Rock solenoid valves. The inspector evaluated the heat rise analysis performed to demonstrate that the field wires to these solenoids are adequate for their required functions and determined that the ambient temperature for the post-accident environment had not been incorporated in the analysis. The inspector discussed this condition with the BG&E engineer who had performed the valve analysis and recommended that BG&E include the above condition in their analysis.

PERSONS CONTACTED

Company Baltimore Gas and Electric  
Calvert Cliff Unit 1  
 Packet/Report No. 50-317/84-27

Dates October 15, 1984

Inspector \_\_\_\_\_

Page 1 of \_\_\_\_\_

☒ Pre-Inspection Conference      ☐ Post-Inspection Conference

NAME (Please Print)	TITLE (Please Print)	ORGANIZATION (Please Print)
Beth Richards	inspection consultant	SANDIA NAT LABS
JOE O. KARSCH	REACTOR ENGINEER	ORAB/DL/NRR/NRC
Sary G. ZECH	Chief, Vendor Program Br.	NRC/IE
Aldis POTAPONS	Chief, EQ Sect, VP Br.	NRC/IE
Dave Trimble	Resident Inspector, <sup>REG I</sup> Calvert Cliff	NRC/REG I
A. Finkel	Lead Reactor Engineering	NRC/REG 2
R. LaGrange	Section Leader	NRC/NRR/EOB
MAX W. YOST	CONSULTANT - ENGINEER	INEL/NRC/EGE
Ken Sebra	Principal Engr	BGE
SSMONTGOMERY	ENGR - NLAU	BGE
MARION	SRENGR	BGE
B. LE	ENGINEER - EQ	NRC/IE
Cheung	Reactor Engineer	NRC RI
T. Hubbard	Eq. Qual & Test Engr	NRC/VPB
Inspector S. NOONAN	CHIEF, EQB, NRR	NRC/NRR/DE
A. B. ANUJE	SUPERVISOR, QA	BGE
Michael S. Cox	QA Auditor	BGE
BC Daschbach	Assoc. Engr	BGE
SHAWN PARR	ENGINEERING TECHNICIAN	BGE
RICK BRANCH	ENGINEER	BGE
LEO F. DUDEK	SUPV. ENGR. QA UNIT	BGE
RICHARD C. L. OLSON	PRIN. ENGR. NRC LIC. & ANALYST	BGE

Eng. Name: Yost

MTR006

TER 47.

Date

## SCREW SHEET DATA

## VERIFICATION

System:

Containment spray

Component:

Pump motor  
MTR006

Location:

ECCS Pump Room  
A119 200 HP

model FRC Tel

Part No./Serial No.

42-15' / S/N 1-5103-33283  
911FK 50400S / S/N 53-628-705  
300 HPType - G  
HP - 200  
-2-1

RPM: 3530

VOLTS 4000

AMPS 26.6

DUTY CONT.

Manufacturer:

ALLIS-chalmers

Flood Level Height:

INS. CASE "B"

model 011

Nema Design B

Service factor 1.15

60 Hz

3 Phase

KVP code 'G'

AMB - 40 °C

B+H End cover

6315

off End

6315

Condition of  
Connectors:

Piping:

Screws:

Bolts:

Lock Washers:

Seals:

Maintenance Schedule:

Ref. Drawings:

System:

Containment spray

Component:

Pump motor  
MTR006

RM 12

Location:

ECCS Pump Room  
A119

200 HP

Model FRC TEL

Part No./Serial No.

911FR504005 / SN 1-5103-33283  
SN 53-628-705  
300 HPSN/53-628-705  
-2-1 300 HP

Manufacturer:

model 504005  
ALLIS-ChalmersVOLT 2300/4000  
60 Hertz  
3 Phase

Flood Level Height:

TEL 47

TYPE GS

Condition of  
Connectors:

HP 300

Piping:

AMP 71.3/41

Screws:

RPM 3550

Bolts:

DUTY CONT.

Lock Washers:

SPACE HEATED

Sensors:

400 V-15 V

Design "B"

INSUL CLASS

F-VPI

Maintenance Schedule:

Ref. Drawings:

Component Cooling

ASCO

RX COOL. SENS.  
STATOR MOTOR

HV 206-391-5RVF

125 VDC 35.1 mT<sub>2</sub>

AIR 150

(1 Hot)

Eng. Name:  
Date

TER #19

(NOV-002)

SCREW SHEET DATA

VERIFICATION

System:

Condensate & Feed Wtr

Component:

SG 12 Feedwater  
Isolation Valve  
2MOV4517

Location:

A315  
Munster Piping Penetrat.

Part No./Serial No.

SBM-2-60

Manufacturer:

Limetorque

Flood Level Height:

N/A

Condition of  
Connectors:

Piping:

Screws:

Bolts:

Lock Washers:

Sen. Ls:

Maintenance Schedule:

Ref. Drawings:

Frame 25P3

Type B

ID#  
267086A7

1HP 6.6

RPM 1700

230/450V

Tap 160F.

TER #19

check if Dures LS  
is used or replaced.

# SCREW SHEET DATA

## VERIFICATION

System:

Condensate & Feed Wtr

Component:

SG 12 Feedwater  
Isolation Valve  
2MOV 4517

1FW 4517

Location:

A315  
Munster Piping Penetrat.

MOV

Part No./Serial No.

SBM-2-60

12 SG

Manufacturer:

Limitorque

Feedwater  
ISOL

Flood Level Height:

N/A

Condition of  
Connectors:

1 MOV

TER #19

Piping:

Screws:

Bolts:

Lock Washers:

Seals:

For Temp 160

Maintenance Schedule:

Ref. Drawings:

check if Durez LS  
is used or replaced.

Date:

## SCREW SHEET DATA

## VERIFICATION

System:

Main Steam

Model NO. 21110-

Component:

MSIV pilot sol valves

6202-5253

~~SG 12 MSIV ICV 4043~~

S/N: 13318

~~ISV 4047~~  
ISV 4042, 43, 44, 45, 46

125V D.C.

Location:

A224

6000 PSI

Part No./Serial No.

21110-6202-5253

Tag NO

Manufacturer:

Republic Teledyne

Directional valves

Flood Level Height:

TER 10

Condition of  
Connectors:

Piping:

Screws:

Bolts:

Lock Washers:

Seals:

Maintenance Schedule:

Ref. Drawings:

Eng. Name:  
Date:

TER 43

SCREW SHEET DATA

VERIFICATION

System:	Safety Injection and Containment Spray	GE Custom 800 Induction motor 400 HP RATED
Component:	LPSI Pumps 11 & 12 MTR 804 (1MA104)	RIM 1770
Location:	A118, A119	4000V 3 Phase 60 52AMP
Part No./Serial No.	5K811052A108	From 81108 TVR K
Manufacturer:	General Electric	Lub Grease 80BC03
Flood Level Height:	N/A	Flt Bearing AFBMA 80BC03
Condition of Connectors:	Drives Taper S&L Cond Pump	Model 5K811052A-104
Piping:	size: 4/21AL	S/N CF937010
Screws:	GRM 3040	Tag NO 1MA 404
Bolts:	RPM 1790	460 HP
Lock Washers:	Mod. NO 0261-172	Time Rating
Seals:	Head 1350	CONT. 90°C
	EXTENT 712	W Resistance
	GRG NO SKF 3215KRC-7394 DB	
Maintenance Schedule:	Buna-N gasket to be replaced at 4.9 yr interval	
Ref. Drawings:		

CPD DP#11, IMH104  
RPM 7770

V. 4000 36600  
HP 460 Cont rise 90°C

AFBMA 80BC03

Instruct: GEH3170

Model  
SK811052A108

S# CF8377711

Sl. -15' Same location as  
containment spray pump #11

# Component Data Sheet

Eng. Name: N. B. L. E.

Date: Oct/17/84

## SCREW SHEET DATA

## VERIFICATION

System: Reactor Vent  
Pressurizer Vent  
Containment Atmospheric Vent

Component: 1SV-103, 104, 105, 106  
1SV-402.

Location: Inside Containment  
Room C230

Part No./Serial No. Model 79UU-001

Manufacturer: TARGET ROCK CORP.

Flood Level Height: Max Flood Level 16'6"  
1SV 103, 104 @ 47'  
1SV 105, 106 @ 20'2"

Condition of  
Connectors: Team Points inside Valve  
enclosure

Piping: 3/8" → 2"

Screws: 056-1032-0625-02-01 (?)

Bolts: (Nuts) 115-1032-0000-02-01

Lock Washers: 211-0010-000-02-01

Seals: CCNP uses GONAX Compound  
to seal conduit entrance

Maintenance Schedule: Gril Replacement 20 yrs  
Seal (u) 10 yrs  
Reed Switch (u) 10 yrs  
Replace entire Valve  
after 18,000 cycles

Ref. Drawings: 79-00-001 (Sh 1/1)  
103-2110-4, Rev. F  
(2 sheets)

Calvert Cliffs  
Unit 1

First

E G Inspect

50-317/84-27

Hgt, Lead

Oct 15-19-84

# 0 Equipment Qualification Documentation

1.1 The Electric Engineering Department Procedure (EEDP-18) Equipment Qualification, is a procedure that provides guidelines for the uniform assessment, evaluation, review and implementation of activities associated with environmental and seismic qualification of Class 1E equipment for Calvert Cliffs Nuclear Power Plant. To support the engineering department evaluation of the EQ program other departments are required to supply input as outlined in EEDP-18. The departments that are defined in EEDP-18 have not started a program that would provide the necessary data to support the criteria of this document. An example of the type of document required is defined in paragraph 1.1.1.

1.1.1 The qualification maintenance summary sheets (QMS), which are supplied by the Nuclear Power Department, have not been prepared as of this inspection period. There is no specific requirement within the Nuclear Power Department to provide the qualification maintenance summary sheet data to the Electric Engineering Department.

1.1.2 Without the type of data that is listed in the QMS sheets, the electric engineering department

cannot identify whether or not the installed safety-related equipment is being maintained in a qualified condition. Inspection findings indicate that the EQ program is not being implemented by the various departments <sup>of the licensee</sup> in such a manner that the criteria of 10CFR50.49 are being complied with. (This subject is further discussed in the site maintenance paragraph of this report)

1.1.3

The lack of written documentation by the licensee various departments in the support of the EQ program is considered to be major area of concern in the effective implementation of this program.

This item is unresolved pending WRC review of the licensee's action. (50-317/84-27-01)

1.2

The "as-built" equipment qualification states that is maintained by the equipment qualification engineering organization has a built in delay of approximately 5 months before verification of the as-built design can be made. When a site modification is made on safety-related electrical qualified equipment, the FCR is not closed until the as-built drawings have been corrected and reviewed by the EQ engineering group.

(4)

2.1 When the EQ engineer verifies that the "as-built" drawings for the modification are correct, he then closes the FCR and up-dates the EQ listing to include the modification design data.

1.2.2 The various <sup>historical</sup> procedures indicate that up to 5 months can occur before the EQ engineer will receive the "as-built" drawings associated with a specific FCR modification. This subject will be reviewed <sup>by the NRC</sup> when the Qualification Maintenance Program (QMP) has been implemented.

113

## 1.0 Equipment Qualification Maintenance Program

2.1 The plant preventive maintenance requirements are described in site procedure CC1-211. The criteria that is in this series of documentation was generated from construction maintenance records, vendor data and maintenance manuals. To assure that qualified properly selected electrical equipment maintenance records are kept in line with the information developed by the E&C engineering group, the Service is planning to generate a Qualification Maintenance Summary Sheet (QMS).

2.1.1 The QMS sheet would be prepared by the Qualification Maintenance Program (QMP) Working Committee. One of the tasks that the working committee establishes would be to assure that QMS sheets provide the technical data and information to maintain the equipment in a qualified configuration. One of the functions of this task is to fill out these QMS sheets as work is started.

2.1.1.1 In addition to the QMS sheets, the Service has

(2)

identified other tasks that are required in a maintenance program that would be necessary to assure that qualified electrical equipment is being maintained in a good field condition. Other tasks that the OMP Working Committee has identified are identified below:

- Program for new and replacement equipment,
- Program for piece part and material replacement,
- 'Maintain' selected system or portion thereof (P&ID drawings, schematic, parts list, etc) in an up-dated status,
- Verify that NRC Bulletin/Information notices concerning environmental qualified equipment has been addressed

2.1.12

maintenance

The Electrical and Controls section of the American Nuclear Power Department in a letter dated September 27, 1984 drafted a proposed plan to establish an overall program that would comply with the intent of NRC 50.49. The scope of the September 27, 1984 letter was similar to the presentation made by the licensee to the NRC on their March 1985 meeting at Bethesda, Md.

2.1.13

implemented by

As of the inspection period the only part of the September 27, 1984 letter that has been implemented by the licensee is the establishment of the Qualification Maintenance Program (QMP) Working Committee. In reviewing the task assignment that are defined in the September 27, 1984 letter and the implementation date of March 1985 that is listed in NRC 50.49, the inspector determined that within the licensee approved the program as outlined as one similar to it, within the next few weeks,

60  
this licensee <sup>implementation</sup> would not meet the NRC date of March, 1985

This item is considered unresolved pending  
NRC review of licensee actions.  
(30-317/54-27-02)

## 2 Equipment Qualification Files

3.1 An inspection of the electrical equipment file by the inspector indicated that the records were not controlled and stored as described in ANSI N45.2.9, 1974 titled "Requirements for Collection, Storage and Maintenance of Quality Assurance Records For Nuclear Power Plants".

3.1.1 The licensee audit report 84-24-01 identified similar type of finding that the NRC inspector identified in the area of records control, storage and completeness. The audit was performed from September 12 - October 1, 1984. The audit report has been typed and was in the process of being issued during this inspection period.

3.1.1.2 In addition to the control and storage of the equipment qualification records, the main concern the inspector had with the records was the lack of complete reports within the equipment record packages. Where supporting data was referenced to support the equipment records file, but not on the file, there was no method on the main package to indicate where the referenced data was located. In some areas, even the supporting data was generated but not submitted as required.

The item was considered unresolved remaining

NRC review of licensee actions. (50-317/84-27-03)

#### 4.0 Site Inspection Verification

4.1 As part of the equipment qualification inspection program an inspection was conducted on October 18, 1984 at the Calvert Cliffs Nuclear Unit 1 site at Lusby, Maryland. Of 15 components that were reviewed by the NRC inspection team at the licensee's office in Baltimore Maryland, 5 components were selected for inspection verification. The 5 components, which were outside of containment, were inspected for the following parameters:

- Manufacturer and Model No.
- Location, Interfaces and Mounting Configuration
- Condition of Installed Item
- Environmental Condition of Location
- Physical Separation

4.1.2

Put component number - up here.

---

Transaction Type

M-3

NRC:1 Form 6 Rev. Oct 80 (Side 1)

☒ New Item☐ Modify☐ DeleteOUTSTANDING ITEMS FILE  
SINGLE DOCKET ENTRY FORM

Docket #

50-317

A. Finkel

Originator

G. Hubbard

Reviewing Supervisor Name

Item Number

84-27-01

Type

UNR

Module #

Area

SME

Resp

E/Z

Action Due Date

12-31-84

MM DD YY

Updt/Clsout Rpt #

Date O/M/Clsd

10-19-84

MM DD YY

Originator

A FINKEL

Modifier/Closer

Descriptive Title

LACK OF MANAGEMENT CONTROLS OVER DEPTS TO SUPPORT THE FO  
EFFORT

Item Number

84-27-02

Type

UNR

Module #

Area

SME

Resp

E/Z

Action Due Date

12-31-84

MM DD YY

Updt/Clsout Rpt #

Date O/M/Clsd

10-19-84

MM DD YY

Originator

A FINKEL

Modifier/Closer

Descriptive Title

THE EQ MAINTENANCE PROGRAM & OTHER TASKS HAVE NOT BEEN APPRO  
VED BY LICENSE MANAGEMENT

Item Number

84-27-03

Type

UNR

Module #

Area

SME

Resp

E/Z

Action Due Date

12-31-84

MM DD YY

Updt/Clsout Rpt #

Date O/M/Clsd

10-18-84

MM DD YY

Originator

A FINKEL

Modifier/Closer

Descriptive Title

EQ FILES NOT IN ACCORDANCE WITH ANSI M45 2.9 ALSO DATA FILES  
NOT COMPLETE MISSING DATA TO SUPPORT QUAL

Item Number

Type

Module #

Area

Resp

Action Due Date

MM DD YY

Updt/Clsout Rpt #

Date O/M/Clsd

MM DD YY

Originator

Modifier/Closer

Descriptive Title

George Heilbrunn

REVIEWER

## PECTORS

A. F. Ükel

[illegible]

## Calvert Cliffs Unit 1 EQ Inspection Report Format

The following report format should be used, as appropriate, to document inspector's activities during the Calvert Cliffs inspection.

Introduction:	Describe scope of evaluation Identify areas evaluated Identify equipment involved Identify system equipment is part of Identify plant location of equipment
Areas of Inspection:	List documents reviewed ✓ List names, titles, and organizations of people contacted List plant locations inspected ✓
Findings:	State requirements ✓ State deviations
Discussion:	Describe any open items Describe what you did Discuss any other comments considered pertinent to the inspection
Comments:	Identify part of inspection module evaluated. Provide constructive comments on module and its usage.
Note:	Inspector's should feel free to expand their reports beyond the areas discussed above if they feel it is justified.

George,

This is not included in my input  
as the persons I contacted are the same  
as the persons you contacted.

Leonard.

# Calvert Cliff / EQ Inspection Report.

Input from Leonard S. Cheung

10/30/84

## A) Scope

To evaluate the environmental qualification of LPSI Pump #11 & #12 motors.

Franklin item # 43

System: Safety Injection and Containment Spray  
Qualification No. MTR004

Manufacturer: General Electric

Component No. 1MA104, 1MA404.

Location: ~~A118, A119~~, ECCS Pump Rooms A118 & A119.

## Documents Reviewed

The inspectors reviewed the following documents to determine if the licensee's qualification data is adequate:

- 1) SCEW sheet pages 34 and 35 dated 10/15/84
- 2) Qualification Documentation data sheets for MTR004, dated April, 1984.
- 3) Qualification Evaluation work sheet dated 4/12/84.
- 4) Wyle Laboratories Report No. 17467-MTR004, Rev. A dated September 19, 1983.
- 5) CE Project Engineering Specification for LPSI Pumps, Spec. No. 8067-487-402, Rev. 2, dated 1/19/71.

Finding

The following discrepancies were identified in the licensee's documentation:

1) Operating time

SCCW sheets pages 34 and 35 indicated that the required operating time was 9 hours. Wylie NEQ report and the licensee's qualification evaluation work sheet indicated the required operating time was 17 days. SCCW sheet pages 34 and 35 showed that the qualified operating time was "NA", which did not meet the requirements. The licensee agreed verbally to change their SCCW sheets to reflect a qualified operating time to ">17 days". The Wylie analysis did show that the qualified operating time was greater than 17 days.

2) Radiation

Wylie NEQ report identified that the most sensitive material used in the subject motors is Buna-N which has a radiation service limit of  $4 \times 10^6$  rad. The SCCW sheet showed ~~that~~ the qualified radiation of  $10 \times 10^6$  rad.

The required radiation level is  $3.8 \times 10^6$  rad

3) Aging

Wylie NQA report recommended that the Buna-N in the motors should be replaced at an interval of 4.9 years or less. If the licensee does not agree with this, their justification should be documented and signed by responsible personnel. Otherwise the SCW sheets should be revised accordingly.

B) Scope

To evaluate the environmental qualification of feedwater isolation Valve (2MOV-4517) Franklin item # #19.

System: Condensate & Feedwater

Location: Main Steam Piping Penetration A315

Qualification No: MOV002

Manufacturer: Linitorque

Model No. SBM-2-60

Documents Reviewed

The following documents were reviewed to determine the adequacy of the licensee's qualification data:

- 1) SCRW sheet page 1, dated October 15, 1980
- 2) ~~Linitorque~~ Qualification Report Summary for MOV002 dated June 14, 1983
- 3) ~~Linitorque~~ Qualification Evaluation work sheet for MOV002 dated June 14, 1983
- 4) Wylie Laboratories Evaluation Report No. 17467-MOV-002 dated March 28, 1983

Finding

Some requirement data in the Wylie report

(5)

are different from that in the SCOW sheet. The licensee explained that the data in the Wylie report are more conservative than required. The qualification data does envelope the requirement ~~data~~ data shown in both documents and therefore the qualification is acceptable.

c) Scope

To evaluate the environmental qualification of Franklin item # 15, hydrogen purge isolation valve 1MOV6902.

Location: East piping penetration room A316

Manufacturer: Pratt

Model No. TN20003

The licensee indicated that this valve ~~will be~~ would be deleted from the Environmental Qualification list because P<sub>2</sub> ID No. 60-248-E, M-65 Rev. 6 showed that this valve is in the non-safety-related portion of ~~the~~ the system. During the meeting between the licensee and NRC, <sup>dated March 16, 1986,</sup> the licensee had indicated that this valve might be removed from 10 CFR 50.49 Scope.

D) Scope

To evaluate the environmental qualification of hydrogen analyzer valves (ISV6507A through G)

Franklin item #95

System: Gaseous Sampling System

Location: West Penetration Room A221

There were Dragon solenoid valves to be replaced by Valcor Series VS26-5295 ~~valve~~ solenoid valves. However, it was not clear from the documents that which of these valves had been replaced. For those valves already replaced or to be replaced soon, the licensee should have SCRW sheets identifying the requirement data vs the qualification data of the new valves.

Wylie report on Valcor valves identified that the qualified life for these valves ~~was~~ operating-time dependant, e.g. for 0% operating time, 30-year life; for 1% operating time, 1.99 year life). The licensee should calculate (or estimate) the operating time and document it in the file.

E) Scope

To evaluate the environmental qualification of  
MSIV pilot solenoid valves

Franklin item #10

System: Main Steam

Qualification No. SV0013

Location: Piping Area A224

Manufacturer: Republican / Teledyne

Model No. 2111062025253

~~With~~ The file provided by the licensee, ~~it~~  
~~app~~ did not contain sufficient documents  
to determine the adequacy of the qualification.

The SCEW sheet indicated that the required  
operating time, the qualified operating time,  
the qualified relative humidity and the  
aging were all "NA". These parameters  
should be evaluated and documented.

F) Plant Tour

The inspectors toured the plant on October 18 to visually observe the mounting configuration of selected equipment outside the Reactor containment and to verify that the type and model numbers of the mounted equipment were consistent with that shown in the file. The following equipment were observed:

- 1) Containment spray pump motors (MTR006) in the ECCS pump rooms
- 2) LPSI pump motors (MTR004) in the ECCS pump rooms.
- 3) MSIV pilot solenoid valves in the piping area  
A224
- 4) The feedwater isolation valve (2MOV4517) located in the main steam piping room
- 5) H<sub>2</sub> analyzer valves (15V6507A through G), located in the West Penetration room.

For item 4 above, the model number could not be verified because of extremely high temperature. For item 5 above, the type and model number could not be verified without scaffolding.

They are ~~about~~ mounted approximately 40 feet  
about floor.

No deficiencies were identified in the  
plant tour.

Resolution of FMO ILC Deficiencies

Item	Qualno	Equipment	Deficiency	Resolution	Submittal pg.
18	MOV019	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	16
19	MOV002	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	18
20	MOV002	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 19. Refer to computer submittal.	17
21	MOV014	Motor Operated Valve	Qualification Documentation Aging Degredation Qualified Life or Replacement Schedule	Equipment qualified. Documentation available. Aging evaluated. Qualified life established. Refer to computer submittal.	251
22	MOV002	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 19. Refer to computer submittal.	248
23	MOV011	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 14. Refer to computer submittal.	223
24	MOV021	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	237
25	MOV012	Motor Operated Valve	Equipment Similarity Aging Degredation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	218

QUALNO	=MOV002	
MFGR	=LIMITORQUE	
PARTNO	=SMB-2-60	
DES	=MOTOR OPERATED VALVE	
VOIT	=460VAC	
VOLTRANGE	=	
FREQ	=	
TEMPMAX	=340F	
TEMPMIN	=	
PRESS	= <del>105</del> 105	
HUMID	=WS	
CHEM	=1.3% B/A	
RAD	=2.04E+3	
QUALMETH	=TEST	
QUALTEST	=SEQUENTIAL	
TIME	=30 DAYS	
ACCURACY	=NA	
AGING	=40 YEARS	
SEISMIC	=	
DOC	=	
COMMENT-1	=C OF C 5/22/73, 4/17/74	8 ↓ B0003
COMMENT-2	=LIMITORQUE TEST REPORTS 600456, 600376A, B0058, B0063	
COMMENT-3	=SPEC N-253	
COMMENT-4	=WYLE REPORT 17467-MOV002/UNIT 2 3/83	
COMMENT-5	=	
REVISION	=83/1 3	

AM 5/17/83

QUALNO	=MOV002
MFGR	=LIMITORQUE
PARTNO	=SMB-2-60
DES	=MOTOR OPERATED VALVE
VOLT	=460VAC
VOLTRANGE	=
FREQ	=
TEMPMAX	=340F
TEMPMIN	=
PRESS	=105
HUMID	=WS
CHEM	=1.3% B/A
RAD	=2.04E+8
QUALMETH	=TEST
QUALTEST	=SEQUENTIAL
TIME	=30 DAYS
ACCURACY	=NA
AGING	=40 YEARS
SEISMIC	=
DOC	=
COMMENT-1	=C OF C 5/22/73, 4/17/74
COMMENT-2	=LIMITORQUE TEST REPORTS 600456, 600376A, B0058, B0003
COMMENT-3	=SPEC M-253
COMMENT-4	=WYLE REPORT 17467-MOV002/UNIT 2 3/83
COMMENT-5	=
REVISION	=83/3

TEX ITEM 19

BeDOK  
3/1/83

CALVERT CLIFFS NUCLEAR POWER PLANT  
SUMMARY REPORT OF CLASS 1E ELECTRICAL EQUIPMENT  
10/15/84

PAGE 1

SYSTEM: CONDENSATE AND FEEDWATER  
SUBSYSTEM: FEEDWATER  
EQUIPMENT: SG 12 FEEDWATER ISOL 1MOV4517 ✓

EQUIPMENT DESCRIPTION		ENVIRONMENT		QUALIFICATION METHOD
PARAMETER	REQUIREMENTS	QUALIFICATION		
COMPONENT NUMBER 1MOV4517	OPERATING TIME 9 hrs	30 DAYS	SEQUENTIAL	
COMPONENT MOV 4MOV 7, 9MP	TEMPERATURE 140F - 321F (max)	300F	TEST	
MANUFACTURER LIMITORQUE	PRESSURE (PSIG) 2.0 (max)	105		
PART NUMBER SHR-2-60	HUMIDITY (%)	WS		
ACCURACY NA	CHEMICAL SPRAY	N/A	.3% B/A	
LOCATION SIS	RADIATION	2.97E+5	2.04E+8	
MAIN STEAM PIPING PENETRATION ✓	AGING	40 YEARS		

OPERATING REQUIREMENTS

REQUIRED DURING LOCA  
HELD

OUTSTANDING ITEMS:

DOCUMENTATION REFERENCES:

1. C. OF C 5/22/73, 4/17/74
2. LIMITORQUE TEST REPORTS 600456, 6003764, 80058, 8003
3. CORRES: 7/28/83.
4. WYLE REPORT 17467-MOV002/UNIT 2
5. MECH-CALC 8/2/101 MAXTEMP=120F
6. PSAR 10A, 11 MAIN STEAM LINE BREAK TEMP=250F
7. RAD ZONES-R1A DUGS 8-180 THRU 2-180

≡ 340F

MOV002

Wyle report requires Durez limit switch rotor to be replaced?

Test Item 19



Calvert Cliffs  
Unit 1

First

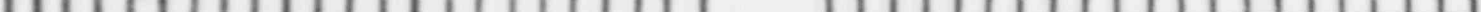
E G Inspect  
50-317/84-27

Hgt, Lead

Oct 15-15-84

G. Hubbard

Reviewing Supervisor Name





## Calvert Cliffs Unit 1 EQ Inspection Report Format

The following report format should be used, as appropriate, to document inspector's activities during the Calvert Cliffs inspection.

Introduction: Describe scope of evaluation  
Identify areas evaluated  
Identify equipment involved  
Identify system equipment is part of  
Identify plant location of equipment

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List names, titles, and organizations of people contacted  
List plant locations inspected ✓

Findings: State requirements ✓  
State deviations

Discussion: Describe any open items  
Describe what you did  
Discuss any other comments considered pertinent to the inspection

Comments: Identify part of inspection module evaluated. Provide constructive comments on module and its usage.

Note: Inspector's should feel free to expand their reports beyond the areas discussed above if they feel it is justified.

George,

This is not included in my input  
as the persons I contacted are the same  
as the persons you contacted.

Leonard.

## 0 Equipment Qualification Documentation

1.1

The Electric Engineering Department Procedure (EEDP-18) Equipment Qualification, is a procedure that provides guidelines for the uniform assessment, evaluation, review and implementation of activities associated with environmental and seismic qualification of Class 1E equipment for Cabot Cliffs Nuclear Power Plant. To support the engineering department evaluation of the EQ program, other departments are required to supply inputs as outlined in EEDP-18. The departments that are defined in EEDP-18 have not started a program that would provide the necessary data to support the criteria of this document. An example of the type of document required is defined in paragraph 1.1.1.

1.1.1 The qualification maintenance summary sheets (QMS), which are supplied by the Nuclear Power Department, have not been prepared as of this inspection period. There is no specific requirement within the Nuclear Power Department to provide the qualification maintenance summary sheet data to the Electric Engineering Department.

1.1.2 Without the type of data that is listed on the QMS sheets, the electric engineering department

cannot identify whether or not the installed safety-related equipment is being maintained in a qualified condition. Inspection findings indicate that the EQ program is not being implemented by the various departments <sup>of the license</sup> in such a manner that the criteria of 10CFR 50.49 are being complied with. (This subject is further discussed in the site maintenance paragraph of this report)

1.1.3

The lack of written documentation by the licensee various departments in the support of the EQ program is considered to be major area of concern in the effective implementation of the program.

This item is unresolved pending WAC review of the licensee's action. (50.317/84-27-01)

1.2

The "as-built" equipment qualification states that is maintained by the equipment qualification engineering organization for a built in delay of approximately 5 months before verification of the as-built design can be made. When a site modification is made on safety-related electrical qualified equipment, the FCR is not closed until the "as-built" drawings have been corrected and reviewed by the EQ engineering group.

2.1 When the EG engineer verifies that the "as-built" drawings for the modification are correct, he then closes the PCR and up-dates the EG history to include the modification design data.

1.2.2 The various <sup>historical</sup> procedures indicate that up to 5 months can occur before the EG engineer will receive the "as-built" drawing associated with a specific PCR modification. This subject will be reviewed when the Qualification Maintenance Program (QMP) has been implemented.

## 1.0 Equipment Qualification Maintenance Program

- 2.1 The plant preventive maintenance requirements are described in site procedure CC1-211. The criteria that is in this series of documentation was generated from construction maintenance records, vendor data and maintenance manuals. It is assumed that good maintenance records and manuals contribute maintenance records and data into the information developed by the E&G engineering group. The Service is planning to generate a Qualification Maintenance Program Sheet (QMS).

- 2.1.1 The QMS sheet would be prepared by the Qualification Maintenance Program (QMP) Working Committee. One of the tasks that the working committee establishes is to ensure that the appropriate personnel provide the technical data and information to maintain the equipment in a condition that is consistent with a qualified configuration. The working committee will also be responsible for the test of the plant and the QMS sheet will be initiated.

=

2.1.12  
entance

The Electrical and Controls section of the  
British Nuclear Power Department in a  
letter dated September 27, 1984 drafted a  
proposed plan to establish an overall  
program that would comply with the  
intent of DOE 50.49. The Sec. of the  
September 27, 1984 letter was written to the  
President's council by the chairman of the  
NRC on the subject of the meeting at  
Butterfield.

1.3  
implemented

As of the date of the letter, the only part  
of the September 27, 1984 letter that has been  
implemented by the licensee is the establishment of the  
Qualification Maintenance Program (QMP) Working  
Committee. In reviewing the task assigned  
that are depicted in the September 27, 1984  
letter and the subsequent date of  
March 1985 that is listed in the letter, the  
regulator determined that the licensee  
approved the program as outlined or one  
similar to it, within the next few weeks,

identified other tasks that are required in a maintenance program that would be necessary to assure that qualified electrical equipment is being maintained in a good field condition. Other tasks that the QMP Working Committee has identified; are identified below;

- Program for new and replacement equipment,
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- 'Maintain' selected system or portion thereof (P&ID drawings, schematic, parts list etc) in an up-dated status,
- Verify that NRC Bulletin/Deficiency notices concerning environmental qualified equipment has been addressed

## 9 Equipment Qualification Files

3.1 An inspection of the electrical equipment file by the inspector indicated that the records were not controlled and stored as described in ANSI N45.2.9, 1974 titled "Requirements for Collection, Storage and Maintenance of Quality Assurance Records For Nuclear Power Plants".

3.1.1 The licensee audit report 84-24-01 identified similar type of finding that the NRC staff be identified in the area of record control, storage and maintenance. The audit was performed from September 12 - October 1, 1984. The audit report has been typed and was in the process of being issued during the inspection period.

3.1.1.2 In addition to the control and storage of the equipment qualification records, the main concern the inspector had with the records was the lack of complete reports within the equipment record possession. Where supporting data was referred to support the equipment records file, but not on file, there was no method in the main package to indicate where the referenced data was located. In some areas, the referenced data was located in the equipment qualification records.

3.1.1.2.1 The equipment qualification records were

the licensee

implementation

will not meet the NRC date of March, 1985

This item is considered unresolved pending  
NRC review of licensee actions.

(50-317/54-27-02)

NRC review of licensee actions. (50-317/84-27-03)

4.0 Site Inspection Verification

4.1 As part of the equipment qualification inspection program an inspection was conducted on October 18, 1984 at the Calvert Cliffs Nuclear Unit 2 site at Lusby, Maryland. Of 15 components that were reviewed by the NRC inspection team at the licensee's office in Baltimore Maryland, 5 components were selected for inspection verification. The 5 components, which were outside of containment, were inspected for the following parameters:

- Manufacturer and Model No.
- Location, Interface and Mounting Configuration
- Condition of Installed Item
- Environmental Condition of Location
- Physical Separation

4.1.2

Part component missing here.

---

# Calvert Cliff / EQ Inspection Report.

Input from Leonard S. Cheung

10/30/84

## A) Scope

To evaluate the environmental qualification of LPSI Pump #11 & #12 motors.

Franklin item # 43

System: Safety Injection and Containment Spray  
Qualification No. MTR004

Manufacturer: General Electric  
Component No. 1MA104, 1MA404.

Location: ~~A118, A119~~, ECCS Pump Rooms A118 & A119.

## Documents Reviewed

The inspectors reviewed the following documents to determine if the licensee's qualification data is adequate:

- 1) SCEW sheet pages 34 and 35 dated 10/15/84
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- 4) Wyle Laboratories Report No. 17467-MTR004, Rev. A dated September 19, 1983.
- 5) CE Project Engineering Specification for LPSI Pumps, Spec. No. 8067-487-402, Rev. 2, dated 1/19/71

## Finding

The following discrepancies were identified in the licensee's documentation:

### 1) Operating time

SCCW sheets pages 34 and 35 indicated that the required operating time was 9 hours. Wylie NER report and the licensee's qualification evaluation work sheet indicated the required operating time was 17 days. SCCW sheet pages 34 and 35 showed that the qualified operating time was "NA", which did not meet the requirements. The licensee agreed verbally to change their SCCW sheets to reflect a qualified operating time to ">17 days". The Wylie analysis did show that the qualified operating time was greater than 17 days.

### 2) Radiation

Wylie NER report identified that the most sensitive material used in the subject motors is Buna-N which has a radiation service limit of  $4 \times 10^6$  rad. The SCCW sheet showed ~~that~~ the qualified radiation of  $10 \times 10^6$  rad.

The required radiation level is  $3.8 \times 10^6 \text{ rad}$

3) Aging

Wyle NQA report recommended that the Buva-N in the motors should be replaced at an interval of 4.9 years or less. If the licensee does not agree with this, their justification should be documented and signed by responsible personnel. Otherwise the sew sheets should be revised accordingly.

(4)

B) Scope

To evaluate the environmental qualification of feedwater isolation Valve (2MOV-4517) Franklin item #19.

System: Condensate & Feedwater

Location: Main Steam Piping Penetration A315

Qualification No: MOV002

Manufacturer: Linitorque

Model No. SBM-2-60

Documents Reviewed

The following documents were reviewed to determine the adequacy of the licensee's qualification data:

- 1) SCSS sheet page 1, dated October 15, 1980
- 2) ~~Licensee's~~ Qualification Report Summary for MOV002 dated June 14, 1983
- 3) ~~Licensee's~~ Qualification Evaluation work sheet for MOV002 dated June 14, 1983
- 4) Wylie Laboratories Evaluation Report No. 17467-MOV-002 dated March 28, 1983

Finding

Some requirement data in the Wylie report

(5)

are different from that in the SCOW sheet. The licensee explained that the data in the Wylie report are more conservative than required. The qualification data does envelope the requirement & data shown in both documents and therefore the qualification is acceptable.

c) Scope

To evaluate the environmental qualification of Franklin item # 15, hydrogen purge isolation valve 1MOV6902

Location: East piping penetration room A316

Manufacturer: Pratt

Model No. TN20003

The licensee indicated that this valve ~~will be~~ would be deleted from the Environmental Qualification list because

Pf ID No. 60-248-E, M-65 Rev. 6 showed that this valve is in the non-safety-related portion of ~~the~~ the system. During

the meeting between the licensee and NRC, <sup>on 10/16/84</sup>

the licensee had indicated that this valve might be removed from 10CFR50.49

Scope

D) Scope

To evaluate the environmental qualification of hydrogen analyzer valves (ISV6507A through G)

Franklin item #95

System: Gaseous Sampling System

Location: West Penetration Room A221

There were Dragon solenoid valves to be replaced by Valco Series VS26-5295 ~~valve~~ solenoid valves. However, it was not clear from the documents that which of these valves had been replaced. For those valves already replaced or to be replaced soon, the licensee should have SCRW sheets identifying the requirement data vs the qualification data of the new valves.

Wylie report on Valco valves identified that the qualified life for these valves was operating-time dependant, e.g. for 0% operating time, 30-year life; for 1% operating time, 1.99 year life). The licensee should calculate (or estimate) the operating time and document it in the file.

E) Scope

To evaluate the environmental qualification of MSIV pilot solenoid valves

Franklin item #10

System: Main Steam

Qualification No. SV0013

Location: Piping Area A224

Manufacturer: Republican/Teledyne

Model No. 2111062025253

~~With~~ The file provided by the licensee ~~it~~  
~~app~~ did not contain sufficient documents  
to determine the adequacy of the qualification.

The SCW sheet indicated that the required  
operating time, the qualified operating time,  
the qualified relative humidity and the  
aging were all "NA". These parameters  
should be evaluated and documented.

(9)

## F) Plant Tour

The inspectors toured the plant on October 18 to visually observe the mounting configuration of selected equipment outside the Reactor containment and to verify that the type and model numbers of the mounted equipment were consistent with that shown in the file. The following equipment were observed:

- 1) Containment spray pump motors (MTR006) in the ECCS pump rooms
- 2) LPSI pump motors (MTR004) in the ECCS pump rooms.
- 3) MSIV pilot solenoid valves in the piping area A224
- 4) The feedwater isolation valve (2MOV4517) located in the main steam piping room
- 5) H<sub>2</sub> analyzer valves (15VES074 through G), located in the West Penetration room.

For item 4 above, the model number could not be verified because of extremely high temperature. For item 5 above, the type and model number could not be verified without scaffolding.

They are ~~about~~ mounted approximately 40 feet  
about floor.

No deficiencies were identified in the  
plant tour.

Item	Qualno	Equipment	Deficiency	Resolution	Submittal pg
18	MOV019	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	16
19	MOV032	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	18
20	MOV032	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 19. Refer to computer submittal.	17
21	MOV014	Motor Operated Valve	Qualification Documentation Aging Degradation Qualified Life or Replacement Schedule	Equipment qualified. Documentation available. Aging evaluated. Qualified life established. Refer to computer submittal.	251
22	MOV002	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 19. Refer to computer submittal.	248
23	MOV011	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. See also Item 14. Refer to computer submittal.	223
24	MOV021	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	237
25	MOV012	Motor Operated Valve	Equipment Similarity Aging Degradation Qualified Life or Replacement Schedule	Similarity established. Aging evaluated. Qualified life established. Refer to computer submittal.	218

COMMENT-1

COMMENT-3

COMMENT-5

4. *Journal of the American Medical Association*, 1997; 277: 1025-1030.

~~105~~ 105

30

$$= 1.5 \times 10^{-4} \text{ mol/L}$$
$$-2.0 \pm 0.4$$

=TESI

$$= \text{Se} \cdot \text{Q} \cdot \text{H} \cdot \text{N} \cdot \text{I} \cdot \text{Al}$$

= 30 1675

214

$$= 40 \text{ kN}$$

48

10

=C Or C 5/22/73, 4/17/74

=LIMITORQUE TEST REPORTS 600456, 600376A, 60058, 60003

60663

=SPEC A-253

=WYLE REPORT 17467-MOV002/UNIT 2 3/83

2

$$= 83.7$$

3

AM 5/17/83

WORLDNO	=NOV000
FRGR	=LIMITED
FRATING	=SHEET 1/1
FRS	=NO LIMITS ON X-AXIS OR Y-AXIS
FRIT	=400000
VOLTRANGE	=
FRAG	=
TEMPMAX	=6400
TEMPMIN	=
PRESS	=100
HUMID	=W0
CHEN	=1.32 1/2
XAD	=2.00 1/2
QUALMETH	=TEST
QUALTEST	=SEQUENTIAL
TIME	=30 DAYS
ACCURACY	=NA
AGING	=40 YEARS
SEUSMIC	=
DOC	=
COMMENT-1	=C DR 1 5/22/77 4/12/74
COMMENT-2	=LIMITED TEST REPORTS 600456, 600476A, B0058, B0005
COMMENT-3	=SPEC 6-253
COMMENT-4	=WYLE REPORT 17467-NOV0002/DRIT 2 3765
COMMENT-5	=
REVISION	=83/3

TEX ITEM 19

BeDOK  
3/1/83

[illegible]

WILLIAMSON  
IN SCOTLAND.

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[illegible]

1.  $\mathcal{A} \subseteq \mathcal{B}$  and  $\mathcal{B} \subseteq \mathcal{A}$  implies  $\mathcal{A} = \mathcal{B}$ .

Case 2:  $2 \times 2$  matrix

$$\Delta C_L = \frac{1}{2} \rho V^2 C_{D0}$$
[illegible]

STATIONARY STATE OF THE SYSTEM

UPDATING RECURSIVELY

STUDY OF THE EFFECT OF THE

OUTSTANDING 116-231

ISSN 0967-0869

1. C OF C 5/22/73, w/1774  
2. C LITONUT 1ST 400PTS 000545, 00053704, 000508, 0003  
3. COUNT 31 7/22/73  
4. WFL REPORT 17667-00002/UNIT 2  
5. WFL-CALC 8/2/70 - WFL-TEMP 1202150120  
6. WFL 105.1 - MAIN STEEL LINE BREAK TEMP 2504  
7. WFL ZONES - 105.1 - 100.1 - 100.1 - 100.1

Tax Item 19

Whyte report requires D. 002? (7.1) Paint needs color to be replaced.

m0y002

TER 19

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