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NUCLEAR REGULATORY COMMISSION  
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SEARCH

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. 50-317/34-27

This refers to the special team inspection conducted by Mr. G. T. Hubbard and other NRC representatives 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 implementation of a program as required by 10 CFR 50.49 for establishing and maintaining the qualification of electric equipment within the scope 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 (SER) 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.

This inspection identified 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. Specifically, your equipment qualification document files were not maintained in an auditable form as required by Paragraph (j) of 10 CFR 50.49 and your implementation of a program to assure compliance with the requirements of 10 CFR 50.49 including the maintenance of qualified equipment and preservation of its qualified status was inadequate or incomplete as described in the enclosed inspection report. You should carefully review these findings and take appropriate corrective action so as to achieve full compliance with 10 CFR 50.49 equipment-qualification requirements prior to March 1985 since noncompliance with the requirements 10 CFR 50.49 after this date will result in enforcement action. In considering your corrective actions, particular emphasis should be given to assuring Quality Assurance involvement in this important

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activity. NRC Region I staff will review your actions relative to these findings during a future inspection, which will also reassess your implementation of 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

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  
G. T. Hubbard, Equipment Qualification and  
Test Engineer

1/25/85  
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  
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Approved by:

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

1/25/85  
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 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 significant deficiencies relative to implementation of 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 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); and (5) lack of sufficient information to allow the NRC to determine that SER/TER commitments had been implemented - Paragraph 4.B. Because of the above deficiencies, the inspection team was not able to verify that the implementation of the licensee's equipment environmental qualification program complies with the requirements of 10 CFR 50.49.

## 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

- \*F. 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 to review the licensee's implementation of the requirements of 10 CFR 50.49 with regard to establishing qualification and review the status of committed actions for SER/TER identified deficiencies.

\*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.

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 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 implementation 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 Paragraph 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 PG&E's conclusions. However, each of these two files had several discrepancies (see paragraphs 4.D.(7) and (14)). The contents of the 14 other files were such that determination 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 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 and adequacy of the licensee's qualification files during a future inspection (50-317/84-27-01).

- (b) An inspection of the electrical equipment qualification files 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 1.A.(4)). Lack of 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 now in use dealing with the list. 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 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; however, during the documentation file review the inspection team identified instances where items of equipment were added or deleted to the 10 CFR 50.49 list (see paragraphs 4.D.(2), (5), and (12) and 4.E.(1)) during the inspection. This indicates that the list was not finalized at the time of this inspection.

(4) EQ Maintenance Program:

The NRC inspector reviewed site procedure CC1-211 which described plant preventive maintenance requirements. The maintenance criteria contained in this documentation was generated from construction maintenance records, vendor data, and maintenance manuals. To assure that environmentally qualified equipment maintenance records are up-dated 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.

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

- Plan for new and replacement equipment
- Plan for piece part and material replacement
- Maintain selected systems or portions thereof [piping and instrumentation drawings (P&IDs), schematics, parts lists, etc.] in an updated status
- 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 to assure that equipment within the scope of 10 CFR 50.49 is maintained in a qualified condition. 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 draft plan that has been implemented is the establishment of the QMP working committee. In reviewing the task assignments and schedules defined in the plan, 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 might not meet the 10 CFR 50.49 implementation deadline.

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

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 all 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 that one document in the file indicated the valve was not qualified while another document indicated it was provided, 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, to NRR, 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 7 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, to NRR, 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 review 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

Of 16 components that were reviewed at the corporate offices in Baltimore, Maryland, TER items 10, 19, 43, 47, and 95 were selected for inspection verification at the plant site. 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 (ISV6507A 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 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.



The inspectors identified one area of concern during the plant tour. The concern was whether BG&E had adequately evaluated the high ambient temperature of the main steam piping penetration room when establishing the qualified life of 10 CFR 50.49 equipment located in the room.

BG&E's evaluation of the ambient temperature environment in establishing the qualified life of 10 CFR 50.49 equipment located in the main steam piping penetration room will be reviewed during a future inspection (50/317/84-27-08).

D. Detailed Review of Qualification File

The NRC inspection team selectively examined BG&E's qualification documentation files 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 to NRR 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, raised 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, indicated 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 condition as discussed in 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, raised 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 told the inspector that these transmitters had now been determined to be outside the scope of 10 CFR 50.49. The inspector found no basis to question the deletion of the transmitter from the 10 CFR 50 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 anomalies were identified in the file; however, there were no BG&E evaluations of the anomalies to see



if they agreed with the test lab's disposition or what affect the anomalies had on BG&E's actual equipment application.

- (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 to 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 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 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
- e (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 lab's 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 "FREPP/FR" Neoprene cable, TER item 83, identified five 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 lack of thermal aging was provided in the file.
  - (e) Qualification was based on a test report which had been previously reviewed by the NRC and found to lack supporting test data to allow the report to be audited. The NRC test report documenting this deficiency was referenced in IE IN 84-44.
- (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 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 determined 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 indicated that they do plan to replace the Dragon valves with the Valcor valves due to spare parts unavailability for the Dragon valves. 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.

(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-87368, 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 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.

E. 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. 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.



However, the procedure did not call for the individual reviewer or group to provide review results to the committee. The inspector identified the following IN items 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.

(1) 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 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.

(2) 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.

(3) 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.

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.