U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-275/83-40

Docket No. 50-275

License No. DPR-76

Licensee: Pacific Gas and Electric Company
77 Beale Street, Room 1435
San Francisco, California 94106

Facility Name: Diablo Canyon Units 1 and 2

Inspection at: Diablo Canyon Project Offices, San Francisco, California

Inspection conducted: December 13 through 20, 1983

Inspectors: P. J. Morrill — 1/24/84
P. J. Morrill, Reactor Inspector — Date Signed

Approved By: H. L. Canter — 1-25-84
H. L. Canter, Chief, Reactor Projects Section 3 — Date Signed

Summary:

Inspection during December 13-20, 1983 (Report No. 50-275/83-40)

Areas Inspected: Unit 1: Followup of Safety Evaluation Report Supplement No. 19 Open Items. This inspection effort required 38 inspector-hours by one Region V inspector and 32 inspection hours by three NRC headquarters personnel.

Results: Two items of noncompliance were identified related to the preparation and maintenance of environmental qualification evaluations and files.

DETAILS

1. Persons Contacted

Pacific Gas and Electric Company

M. Tresler, Assistant to Project Engineer
T. Crawford, Instrument and Control, Group Supervisor
*R. Bitting, Instrument and Control, Deputy Group Supervisor
*T. Libs, Licensing Engineer
W. Vahlstrom, Electrical Engineer
*B. Lew, Project Licensing Engineer
E. Connell, III, Mechanical Engineering, Group Supervisor
*J. Herbst, Electrical Engineer
D. Ogden, Licensing Engineer
S. Auer, Electrical Group Supervisor
*E. Brady, HVAC, Group Supervisor
*G. Moore, Diablo Canyon Project Engineer, Unit 1
*D. Hardie, Diablo Canyon, Assistant Project Engineer
*M. Jackson, Diablo Canyon, Project Quality Assurance Supervisor
*J. Hoch, Diablo Canyon, Project Manager
*T. Libs, Diablo Canyon, Licensing Engineer
*R. Anderson, Diablo Canyon, Engineering Manager
G. Brotherson, Heating and Ventilation Engineer
F. Chan, Electrical Engineer

2. Details

This inspection was conducted to verify the status of Diablo Canyon (DC) Safety Evaluation Report (SER), Supplement 19 follow up items numbers 1, 2, 4, 5, 9, and 12. These items are included in Table C.8.3 of the DC SER, supplement 19.

Item 1. "PG&E will perform a startup test of AFWS runout control system to confirm dynamic stability." (C.4-3) (Closed)

Licensee personnel stated that a test of the Auxiliary Feedwater system (AFWS) Level Control operation would be conducted prior to entering Mode 2 and that this was stated in Enclosure 3 to the licensee's letter (Schuyler to Knighton) dated December 6, 1983. The inspector observed that the test described in the licensee's letter of December 6, 1983 does not test the dynamic stability of the AFWS during pump run-out conditions. However, licensee personnel stated that start-up test 37.12 Addendum No. 3 will confirm the operability and stability of the AFWS level control valve actuators (which have been changed since the last test of the AFWS) and demonstrate that the system will maintain steam generator water level.

Item 2. "PG&E will delete from design drawing steam trap in steam supply line for turbine driven pump of AFWS." (C.4-5) (Closed)

The inspector observed that one of five steam traps on the steam supply line to the steam driven auxiliary feedwater pump had been deleted from PG&E Drawing 102004, sheet 5 and sheet 19 by change number 15, dated October 27, 1983.

Item 4. "PG&E will correct table in environmental qualification report with respect to flow transmitters and flow control valves in AFWS." (C.4-12) (Closed)

Licensee personnel stated that PG&E Drawing 050909 was a tabulation of all class IE equipment (excepting individual splices and cable runs) which supercedes the list submitted to the NRC in the 1981 "Environmental Qualification Report". The inspector verified that flow transmitters FT-78, FT-50, FT-77 and FT-79 as well as flow control valve FCV-95 were included in the licensee's "Electrical Equipment Qualification List" Version 1.02 - May 1983 Run date December 12, 1983 (PG&E Drawing 050909, Rev. 1). This appears consistent with Enclosure 6 of the licensee's letter, Schuyler to Knighton, dated December 6, 1983.

Item 5. "PG&E will conduct analyses to determine qualified life of motor capacitor for steam generator control valves." (C.4-12) (Closed)

The inspector verified that the licensee's qualification file IH-14 contained documents for the qualified life and radiation aging of the motor capacitor consistent with enclosure 7 of the licensee's December 6, 1983 letter. The inspector observed that the lifetime calculation using the "Arrhenius Equation" was hand written on unnumbered sheets of paper, apparently not checked by another engineer, and not approved by supervisory personnel. This observation and the licensee's response is discussed further in the follow-up of item number "12" of this report. The inspector also observed that (1) the subject capacitor failed during testing at a total dose of 8×10^6 rads, however (2) licensee personnel had calculated that the total integrated dose the capacitor would experience was 1.14×10^6 rads, and (3) licensee personnel stated that the capacitor was qualified to a level of 1.7×10^6 rads. The inspector also observed that qualification file IH-14 was being examined and revised by the project I&C Group Supervisor and that maintenance intervals for replacement of the capacitor had been determined based on the life time calculations.

Item 9. "Staff will confirm that any modifications required in safety-related systems with respect to pressure/temperature rating and power-operated valve operability are implemented." (C.4-26) (Closed)

The inspector examined project copies of the ten design change packages which were listed in a licensee letter, Hoch to Eisenhut, dated October 7, 1983. Based on these documents nine of the subject changes have been completed by site construction forces and seven of the changes have been approved and accepted by the plant manager. The one change not completed (Design Change Request DC1-EM-3312) is to reset the steam driven auxiliary feedwater turbine overspeed trip set-point. Licensee personnel stated that this change will be completed prior to entering mode 3. This is consistent with enclosure 8 of the licensee's letter, Schuyler to Knighton, dated December 6, 1983.

Item 12. "Staff will evaluate PG&E results of reanalysis with respect to assuring environmental qualification of equipment." (C.4-27) (Open)

At the beginning of the inspection the inspector requested documentation of the licensee's review of environmental qualification files described in enclosure eleven to the licensee's letter, Schuyler to Knighton, dated December 6, 1983. Licensee engineering personnel stated that they had reviewed all the subject qualification files but had not documented these reviews. They went on to state that five electrical and three instrument and control qualification files require reverification documentation. Additionally, seven qualification files had been recently completed for heating, ventilation and air conditioning (HVAC) equipment. The inspector's examination included the documents listed below as well as discussions with licensee personnel to verify the adequacy of the licensee's undocumented reviews.

Environmental Qualification Files:

EH-3 Raychem/Flamtrol Cable
IH-24 Barton 763/764 Pressure Transmitters
IH-16 SME Series Limitorque Valve Operator
HH-2 ASCO Solenoid Valves
IH-14 ITT General Controls Actuators

"Electrical Equipment Qualification List," DWG 050909, Rev. 1 dated 12/12/83.

Design Criteria Memorandum

M-73, "Component Pressurization and Environmental Effects from High Energy Pipe Break Outside Containment", approved 12/7/83

CH-75, "Environmental Qualification Review of HVAC Equipment", approved 9/1/83

During this review the inspector made the following observations:

(a) Each environmental qualification (EQ) file includes a "Component Evaluation Report" (CER), a "system component evaluation work sheet" (SCEW), an index of references, and the references themselves. The CER is a review of the adequacy of the qualifications of components to survive severe environments and includes instructions as to how to do the review and how to assemble the associated EQ file. The CER is signed by the engineer completing that document and approved by his/her supervisor. The SCEW is a summary wheet which lists acceptance criteria as well as where and how these criteria are met. Reportedly, the NRC headquarters staff had audited the EQ files in mid-1981 and found the licensee's work inadequate; in a follow-up audit in the Fall of 1981 the staff examined the licensee's reworked EQ files and found them acceptable. The SCEW sheets which were prepared in the Fall of 1981 were included in the licensee's equipment qualification report which was submitted to the NRC headquarters staff also in the Fall of 1981. No major changes to the files were identified (with one exception, paragraph 2.e, below)

until recently, when licensee personnel were required to update the file due to changed temperatures and pressures of the pipe break outside containment (PBOC) analyses. The inspector observed that the CERs contained additional handwritten pages (for example, pages 3a, 6a, 6b, etc.) and did not appear to be adequately controlled. Licensee personnel stated that the original files had been placed into their records management system (RMS), an indexing and microfilming records system, and that the microfilm records could not be changed and were the copies of record.

(b) The original EQ files had been split between the I&C and Electrical disciplines for the current revision. In addition seven new EQ files were found to be necessary and were assigned to the HVAC discipline. The Electrical group was preparing one new EQ file, revising four original CEWs and SCEWs to reflect the changed environments, and adding a cover sheet to reflect the revision being made and the sign-off of personnel responsible for the work. The I&C group appeared to be using a similar sign-off sheet, but had revised their CEWs using a different format. The HVAC group had contracted with Nutech (a consultant) to complete the CEWs, SCEWs, and EQ files. Nutech personnel had revised the CEW format. The completed HVAC CEWs had been signed by the Nutech engineer doing the work, as well as by the electrical engineer and supervising electrical engineer doing the EQ work for the electrical discipline and the HVAC supervisor. Since each discipline was revising the CEW into a different format the inspector asked what project procedures or instructions were in place to conduct this work and whether the CEWs and SCEWs were quality documents (i.e., subject to the licensee's QA program). The electrical engineers and I&C group supervisor stated that the CEW and SCEW were their own procedures and were not quality documents. The HVAC Group Supervisor was not sure if they were quality documents.

(c) During the examination of EQ file EH-3 "Cable-Raychem/Flamtrol" the inspector observed that reference 9A entitled "Accident Operability" was a one page aging calculation which was undated and unsigned. This is similar to the unsigned and undated aging calculation found in EQ File IH-14 for a steam generator level control valve motor capacitor (see Item "5" of this report). The inspector also observed that licensee personnel had made hand changes to Wyle Laboratory Report 26336-1. These changes were to change assumed operating temperature to 120 F from 110 F and recalculate the effective aging of the subject cable. Another individual, separate from the preparing engineer or his supervisor, had signed and dated this change. When questioned regarding these observations, licensee personnel stated that the signatures at the end of the CEWs indicated that the responsible engineer and the approving supervisor had reviewed the entire EQ file, including references, and were satisfied that they were correct. They stated that the changes to the Wyle Laboratory report were conservative, did not change data or conclusions, and did not obscure the original work. Since it was their report, they felt they could use it as they felt appropriate, as long as they did not re-publish the document.

(d) During the examination of EQ file HH-2 "ASCO Non-NP Solenoid Valves" the inspector verified that the construction of the EQ file was similar to the Electrical EQ file. However, the HVAC group supervisor had prepared a Design Criteria Memorandum (DCM) CH-75 "Environmental Qualification Review of HVAC Equipment", approved for use October 19, 1983, which described the criteria for the environmental design verification for HVAC equipment, established qualification review procedures, and described acceptance criteria. The inspector also observed that the aging calculations for this file were referenced in the EQ file but were located in the discipline calculation files. These calculations were signed by the responsible engineer, dated, signed by the checking engineer, and signed by the approving group supervisor. When questioned, the supervisor explained that the DCM had been prepared to provide guidance to Nutech personnel and that he had decided to retain calculations in the calculation files where they could be controlled.

(e) During the examination of EQ file IH-24 "Barton Pressure & Differential Pressure Transmitters" the inspector observed that changes appeared to have been made to the CER and SCEW since the original documents were prepared in August 1981. Qualification data and references had not been available at that time, consequently when the licensee submitted the SCEW sheet to the NRC staff in late 1981 there were blank spaces which licensee personnel stated would be followed up. These blanks were filled in on the SCEW sheet and apparent changes were made in the body of the CER (i.e., different ink & erasures). The last sheet of the CER had also been signed by an engineer and dated 1/7/83. The inspector also observed that this document had no evidence of being placed in the licensee's RMS. When questioned regarding this situation, licensee personnel stated that the document should have been approved by supervisory personnel and that they were not sure why it had not been placed into the RMS.

Because of the apparent inconsistencies in the preparation and handling of the EQ files three NRC headquarters staff personnel (B. Buckley, H. Walker, and R. Borgen (consultant from EG&G)) examined selected EQ files on December 19 and 20, 1983. Their examination did not disclose any technical problems with the contents of the EQ files and their Trip Report, dated January 5, 1984, is attached.

3. Exit Interview

At the conclusion of the inspection the inspectors met with licensee personnel indicated in paragraph 1 to discuss the scope and findings of the inspection. In response to the observation of the inspectors regarding the EQ files licensee representatives:

(a) Committed to complete the documentation of the EQ file update due to the changes to the PBOC analyses by December 30, 1983 and to document this completion by sending a confirming letter to the NRC by January 3, 1984

(b) Stated that the technical requirements of the CERs of different disciplines were unchanged and that there was no intention to change the format

(c) Stated that the EQ files do not fully meet the requirements of a design verification report, the files were constructed to meet the requirements of NUREG-0588

(d) The quality of the components involved is assured through control of specifications and procurement documents and the distribution of environmental data to all disciplines in design criteria memoranda.

The inspectors observed that the last QA audit of these activities in engineering occurred in July 1981 and asked the licensee personnel if the CERs and associated EQ files were subject to the QA program. Licensee personnel stated that they were not. The inspector stated that this position appeared inconsistent with the nature and significance of the EQ reviews and Criterion 3 of Appendix B to 10 CFR 50, and therefore appeared to warrant enforcement action.

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

JAN 5 1984

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

FROM: Harold Walker
Equipment Qualification Branch
Division of Engineering

THRU: RGL Robert G. LaGrange, Section Leader
Environmental Qualification Section
Equipment Qualification Branch
Division of Engineering

SUBJECT: TRIP REPORT - AUDIT OF DOCUMENTATION ASSOCIATED WITH RESOLUTION OF IDVP FOLLOWUP ITEMS 4, 12 AND 14 IDENTIFIED IN SUPPLEMENT NO. 19 OF THE DIABLO CANYON SER (NUREG-0675)

On December 19 and 20, 1983 Bart Buckley (NRR), Philip Morrill (Region V), Dick Borgen (INEL) and the writer (NRR) visited the Pacific Gas and Electric Company (PG&E) office in San Francisco, California. The purpose of the visit was to evaluate the technical adequacy of PG&E's resolution of IDVP followup items 4, 12 and 14, identified in Supplement No. 19 of the Diablo Canyon SER, and to audit the Equipment Qualification files to verify the resolution of commitments made during the audits of these files performed by EQB in 1981.

The following is a list of files that were audited, the equipment type that each file represents, and the IDVP followup item number(s) the files are related to.

Files	Equipment Type	IDVP Followup Item No.(s)
(1) HH-2	ASCO Solenoid Valves	12
(2) EH-3	Raychem Cable, Flametrol	12, 14
(3) IH-16	Limitorque SMB series	4, 12
(4) IH-21	Acoustic Monitor, TEC	NA
(5) IH-24	Barton Pressure Transmitter 763, 764	4, 12

HH-2 is one of seven new files that resulted from the resolution of followup item 12, whereby an reanalysis of high energy line breaks (HELBs) outside containment identified areas of potentially harsh environments previously identified as mild. This file contains a test report and arrhenius calculations that, we concluded, demonstrate that the equipment covered by this file is environmentally qualified for the environment resulting from the reanalysis.

EH-3 and IH-16 are two of eight files concerning equipment previously qualified for a HELB outside containment, which now must be demonstrated qualified for the environments resulting from the reanalysis mentioned above. Although documentation was in progress, we concluded that the information in these two files demonstrates that the equipment is environmentally qualified for the environment resulting from the reanalysis.

IH-21 and IH-24 are files that were reviewed in 1981. At that time, the equipment represented by these files were in the process of being qualified. Based on the information in file IH-21, we concluded that the associated equipment, located inside containment, is environmentally qualified and that the file is complete. The equipment associated with File IH-24 is located both inside and outside containment. Based on the information in this file, we concluded that the equipment is environmentally qualified for the accident environment it could be subjected to inside containment and is therefore qualified for the environment resulting from the reanalysis of HELB environments outside containment.

PG&E informed us that a total of fifteen files are affected by the reanalysis. Seven of the fifteen represent equipment previously thought to be in a mild environment; the remaining eight represent equipment previously qualified for HELBs outside containment. PG&E stated that all affected files have been reviewed and that all equipment is or remains qualified in accordance with the requirements of NUREG-0588. PG&E also stated that documentation of this latest review is in progress and will be completed by December 31, 1983. PG&E has committed to confirm to the NRC, in writing, when documentation is complete.

During this visit we also discussed with PG&E our conclusion, based on a review we performed just prior to meeting with them, that an October 14, 1974 Okonite letter report, referenced by PG&E in response to IDVP followup item No. 14, indicated that the cable involved was qualified for 24 hours, and not 48 hours as stated in their December 12, 1983 letter. With regard to this followup item, PG&E informed us that:

1. The cables identified in their December 12, 1983 letter are not subject to direct jet impingement since they are enclosed in conduit.

2. Some of these conduits may be subjected to jet impingement. (Note: This issue is currently being reviewed by the NRC staff.)

3. The 540°F temperature used for qualification of the cables was determined based on the maximum temperature of the steam inside the pipe prior to the postulated break.

4. The cables have been demonstrated qualified for this temperature for 24 hours. Since the plant operator will identify the break and take action to isolate it in less than two hours, demonstrating qualification for 24 hours is adequate.

PG&E committed to document the above in a letter to the NRC by December 31, 1983.

Based on the results of the audit review we performed and the information and commitments from PG&E, described above, IDVP followup items 4, 12 and 14 are considered resolved, and no further effort from EQB is required.

Harold Walker
Equipment Qualification Branch
Division of Engineering

cc: R. LaGrange
J. Wermiel
H. Schierling
B. Buckley
P. Morrill
R. Borgen, INEL