

FOIA-84-743

RESPONSE TYPE

FINAL

PARTIAL 4TH

DATE

SEP 14 1987

DOCKET NUMBER(S) (if applicable)



RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) REQUEST

PDR 016

REQUESTER

MR. DEVINE AND Ms DIXON

PART I. - RECORDS RELEASED OR NOT LOCATED (See checked boxes)

No agency records subject to the request have been located.

No additional agency records subject to the request have been located.

Agency records subject to the request that are identified in Appendix _____ are already available for public inspection and copying in the NRC Public Document Room, 1717 H Street, N.W., Washington, DC.

Agency records subject to the request that are identified in Appendix J are being made available for public inspection and copying in the NRC Public Document Room, 1717 H Street, N.W., Washington, DC, in a folder under this FOIA number and requester name.

The nonproprietary version of the proposal(s) that you agreed to accept in a telephone conversation with a member of my staff is now being made available for public inspection and copying at the NRC Public Document Room, 1717 H Street, N.W., Washington, DC, in a folder under this FOIA number and requester name.

Enclosed is information on how you may obtain access to and the charges for copying records placed in the NRC Public Document Room, 1717 H Street, N.W., Washington, DC.

Agency records subject to the request are enclosed. Any applicable charge for copies of the records provided and payment procedures are noted in the comments section.

Records subject to the request have been referred to another Federal agency(ies) for review and direct response to you.

In view of NRC's response to this request, no further action is being taken on appeal letter dated _____.

PART II. A - INFORMATION WITHHELD FROM PUBLIC DISCLOSURE

Certain information in the requested records is being withheld from public disclosure pursuant to the FOIA exemptions described in and for the reasons stated in Part II, sections B, C, and D. Any released portions of the documents for which only part of the record is being withheld are being made available for public inspection and copying in the NRC Public Document Room, 1717 H Street, N.W., Washington, DC, in a folder under this FOIA number and requester name.

Comments

The staff has informed us that these records are also responsive to your separate requests FOIA-84-744 and FOIA-84-776.

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PDR FOIA
DEVINE84-743 PDR

SIGNATURE, DIRECTOR, DIVISION OF RULES AND RECORDS

Donna H. Mundy

<u>Number</u>	<u>Date</u>	<u>Subject</u>
1.	-	Allegation No. 25 - RV-83-A-33 (1 Page)
2.	11/7/83	Ltr from Purple to Files Subject: Telephone call from Dr. Henry Myers, Subcommittee on Energy & Environment (2 Pages)
3.	-	Allegation No. 189 - RV-84-A-25 - (1 Page)
4.	-	Allegation No. 190 - RV-84-A-25 - (1 Page)
5.	-	Allegation No. 191 - RV-84-A-25 - (1 Page)
6.	-	Allegation No. 192 - RV-84-A-25 - (1 Page)
7.	-	Allegation No. 193 - RV-84-A-25 - (1 Page)
8.	-	Allegation No. 194 - RV-84-A-25 - (1 Page)
9.	-	Allegation No. 195 - RV-84-A-25 - (1 Page)
10.	7/10/84	Ltr from Bishop to Eisenhut, Subject: Diablo Canyon Allegations Assigned for Nuclear Reactor Regulation (1 Page)
11.	-	Allegation No. 189-195 - RV-84-A-25 - (1 Page)
12.	2/7/84	Allegation Form - RV-84-A-25 - (1 Page)
13.	-	Affidavit - (20 Pages)
14.	1/2/84	Ltr from Hudson to Gilinsky Subject: Report #2 - QA Deficiencies in the Ultrasonic Measurement of Reactor Coolant Pressure Boundary Valves for Minimum Wall Thickness Requirements as Requested by the Atomic Energy Commission in their Letter of 6/20/72 to PG&E at Diablo Canyon (83 Pages)
15.	-	Allegation No. 188 - RV-84-A-24 - (1 Page)
16.	-	Problem Statement - Allegation No. 188 - RV-84-A-24 (1 Page)
17.	-	Affidavit (31 Pages)
18.	-	Allegation No. 133 - RV-84-A-10 - (3 Pages) Problem Statement -
19.	-	Allegation No. 134 - RV-84-A-11 - (3 Pages) Problem Statement
20.	2/4/84	Welding information - note from Tresler (35 Pages)
21.	-	Problem Statement - Allegation No. 132 - RV-84 A-09 (1 Page)
22.	-	Allegation No. 132 - (4 Pages)
23.	3/8/84	Ltr from Schuyler to Martin Subject: Secy-84-61, Item 132 (9 Pages)
24.	10/9/83	Pipe Support Design Tolerance Clarification Form - (25 Pages)
25.	10/11/82	Discrepancy Report - (3 Pages)
26.	8/11/83	Allegation Date Form - (1 Page)

<u>Number</u>	<u>Date</u>	<u>Subject</u>
27.	-	Allegation No. 26 - RV-84-A-33 - (1 Page)
28.	-	Allegation Nos. 24, 26, 46 & 66 - RV-83-A-28, RV-83-A-33, RV-83-A-46 & RV-83-A-52 (5 Pages)
29.	8/11/83	Allegation Data Form - (1 Page)
30.	-	Allegation Nos. 25, 58, 142, 154, 176 - RV-83-A-33, RV-83-A-57, RV-83-A-15 & RV-84-A-17 (6 Pages)
31.	-	Details on an Inspection - (3 Pages)
32.	-	False floor in cable spreading rooms is not class 1 - (4 Pages)
33.	-	Anchor Bolts - Allegation File No. 25 - (13 Pages) Notes from a telecon
34.	2/27/84	Conversation Record - (1 Page)
35.	-	Problem Statement - RV-83-A-33- (1 Page)
36.	- 8/11/83	Allegation Data Form - (1 Page)
37.	11/19/83	Allegation Data Form - (1 Page)
38.	11/15/83	Memo from Denton to Martin with note from Martin to Bishop (2 Pages) Encl: Ltr from Purple to Files Subject Telephone call from Dr. Henry Myers, (2 Pages) Encl: Conversation Record - (1 Page)
39.	10/3/83	Pipe Support Design tolerance Clarification Form - (24 Pages)
40	-	Memo from Morrill to Bishop Subj Inspection Results, LLL Personnel Examination of Raceway Support Bolted Connections at Diablo (2 Pages)
41.	12/5/83	Ltr from Wade to Kirsch Subject: Inspection Status Report (9 Pages)
42.	6/1/79	Ltr from Spencer to Crane Subject: NRC Inspection - (39 Pages)
43.	7/5/84	Ltr from Lubbock to Moore Subject: Response to Footnote 21 of Memo and Order of 6/28/84 (ALAB-775) - (3 Pages)
44.	4/27/84	Ltr from Schuyler to Martin Subject Welding Base Plates to Fan Cooler Structure - (1 Page)
45.	-	Route Sheet with ASLA attached - (3 Pages)
46.	3/9/83	Field Warehouse Requisition - (29 Pages)
47.	8/25/83	Discrepancy Report - (5 Pages)
48.	9/3/83	Discrepancy Report - (2 Pages)
49.	9/3/83	Discrepancy Report - (2 Pages)
50.	9/3/83	Discrepancy Report - (2 Pages)
51.	9/3/83	Discrepancy Report - (5 Pages)
52.	9/30/83	Discrepancy Report - (5 Pages)

APPENDIX J

Release Documents in Entirety

<u>Number :</u>	<u>Date</u>	<u>Subject</u>
53.	-	Progress Report (1 Page)
54.	-	Progress Report (1 Page)
55.	-	Progress Report (1 Page)
56.	8/26/83	Telephone Call message with cover letter (facsimile) - (2 Pages)
57.	9/7/83	Telephone Calls (2) - (2 Pages)

GOVERNMENT ACCOUNTABILITY PROJECT

Institute for Policy Studies

1901 Que Street, N.W., Washington, D.C. 20009

(202) 234-9382

September 13, 1984

Director
Office of Administration
U.S. Nuclear Regulatory Commission
Washington DC 20555

FREEDOM OF INFORMATION
ACT REQUEST

FOIA-84-743
Rec'd 9-17-84

To Whom It May Concern:

Pursuant to the Freedom of Information Act (FOIA), 5 U.S.C. §552, the Government Accountability Project (GAP) request copies of any and all agency records and information, including but not limited to notes, letters, memoranda, drafts, minutes, diaries, logs, calendars, tapes, transcripts, summaries, interview reports, procedures, instructions, files, graphs, engineering analyses, charts, maps, photographs, agreements, handwritten notes, studies, data sheets, notebooks, books, telephone messages, computations, voice recordings, any other data compilations, interim and/or final reports, status reports, and any other records relevant to and/or generated in connection with the Safety Evaluation Report on the separation of the Diablo Canyon Nuclear Plant, Unit 1, and Unit 2, NRC, which provided the NRC Staff with information on whistleblower charges. We request that each responsive document be identified by the allegation number(s) to which it may relate.

If any of the materials covered by this request have been destroyed and/or removed, please provide all surrounding documentation, including but not limited to a description of the action(s) taken, relevant date(s), and justification(s) for the action(s).

GAP request that fees be waived, because " findings information can be considered as primarily benefitting the general public," 5 U.S.C. §552(a)(4)(A). GAP is a non-profit, non-partisan public interest organization concerned with honest and open government. Through legal representation, advice, national conferences, films, publications and public outreach, the project promotes whistleblowers as agents of government accountability. We are requesting the above information as part of an on-going monitoring project on the adequacy of the NRC's efforts to protect public safety and health at nuclear power plants.

For any documents or portions that you deny due to a specific FOIA exemption, please provide an index itemizing and describing the documents or portion of documents withheld. The index should provide a detailed justification of your grounds for claiming each exemption, explaining why each exemption is relevant to the document or portion of the document withheld. This index is required under Vaughn v. Rosen(I), 484 F.2d. 820 (D.C. Cir. 1973), cert. denied, 415 U.S. 977 (1974).

We look forward to your response to this request within ten days.

Yours truly,
Thomas Devine
Thomas Devine
Legal Director, GAP

Crystal Dixon
Crystal Dixon
Legal Intern

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

November 7, 1983



NOTE FOR: Files (LIMITED DISTRIBUTION)

FROM: Robert A. Purple, Deputy Director
Division of Licensing

SUBJECT: TELEPHONE CALL FROM DR. HENRY MYERS, SUBCOMMITTEE
ON ENERGY AND ENVIRONMENT

As a followup to our meeting last Friday, Dr. Myers called me today to further discuss the information that he had on Diablo Canyon deficiencies. He prefaced his conversation by stressing that he intended to give me this information only on the condition that by Friday of this week, I would call him to tell him what has been done to follow up on the information. He expressed reluctance to convey the information to me since he was not confident that I would take the matter seriously and make a vigorous effort to get to the bottom of things. He asked me to identify who the single person was who was in charge of resolving all of the Diablo Canyon allegations and determining their significance. I told him that since the issues could involve construction deficiencies, design control deficiencies and perhaps even matters for investigation of wrongdoing, the only single person in charge would be the Executive Director for Operations. He noted that, since most of the items appear to be related to construction deficiencies, he planned to call Jack Martin of Region V later today. (I subsequently telephoned Mr. Martin's office, who was unavailable, and relayed a summary of the following information to Tom Bishop of his staff.)

Dr. Myers did not wish to provide copies of the documents to us that we had seen last Friday in his office. He preferred instead to orally identify the areas that he believed the NRC should look into. I believe that he felt that by defining the areas in broad enough terms, the identity of the alleged would be more protected than if he gave us the documents. He warned me that by passing this information on to me that I now shared a personal responsibility for protecting the identity of the alleged and that if, as a result of our investigation of these issues, the identity of the alleged is made known that the responsibility for that compromise rested with me. He then outlined the following nine areas of inquiry that he believes the NRC should investigate.

1. Review all new conformance reports concerning the purchase of material from non-approved vendors over the last 2 or 3 years. Check all purchase orders against approved vendor lists.

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2. Review all NCR's vs DCN's and check the disposition thereof. Look at PG&E's DCN's vs the Foley and Pullman Companies' DCN's for discrepancies. } #61
3. Provide a description of deviations over the past 2 years in DCN's and revisions thereto regarding the control room pressure and ventilation system. }
4. Request all documentation from PG&E, Foley and Pullman regarding the upgrading of materials from non-essential to essential. — #63
5. Check documentation to establish Foley and Pullman record on certification of inspectors. Review NCR's against inspector control prior to 1983. Note those NCR's and their disposition. — #57
6. Are there any NCR's on Redhead stud anchors? — #58
7. Review inspection reports and NCR's by Foley and Pullman on testing of concrete and grout and the use of samples. — #64
8. Ask PG&E and Foley for all NCR's regarding wire traceability. Check work packages to determine if they clearly indicate the source of all wires. — #59
9. Ask for documentation establishing wire cable termination and pull test and inspections performed per Appendix B. — #62

Mr. Myers reiterated that he expected to hear from me within a few days with respect to the Agency's actions on these allegations.



Robert A. Purple, Deputy Director
Division of Licensing



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

JUL 16 1984

MEMORANDUM FOR: D. G. Eisenhut, Director
Division of Licensing

FROM: T. W. Bishop, Director
Division of Reactor Safety and Projects, Region V

SUBJECT: DIABLO CANYON ALLEGATIONS ASSIGNED FOR NUCLEAR REACTOR
REGULATION

Based on the Allegation Panel Review Board on July 12, 1984, it was determined that the following allegations are referred to NRR for close out responsibility.

- NRC Allegation Numbers: 194
- 368
- 351
- 479
- 484

Should you have questions or require additional information please do not hesitate to contact myself or my staff.

T. W. Bishop, Director
Division of Reactor Safety
and Projects

- cc:
- J. Martin, RV
 - ✓ D. Kirsch, RV
 - G. Knighton, NRR
 - H. Schierling, NRR
 - R. Volmer, NRR
 - T. Crowley, RV

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AFFIDAVIT

Covers
revised
petition
to page 26
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etc

REC'D FROM T. DEVINE
(OF GAP) on 2/3/84
5:20PM.
- B

My name is Harold Hession. I am submitting this affidavit freely and voluntarily without any threats, inducements, or coercion, to Mr. Thomas Devine, who has identified himself to me as the Legal Director of the Government Accountability Project of the Institute for Policy Studies. I am submitting this statement to evidence my concern over a comprehensive quality assurance (QA) breakdown for the work of Pullman Power Products at the Diablo Canyon Nuclear Power Plant. There is no possible justification for allowing this nuclear power plant to go critical until the Nuclear Regulatory Commission (NRC) confirms the full scope of QA breakdown; identifies the causes; and monitors completion of a corrective action program, including a full reinspection of safety-related work at the plant. In many instances, the reinspection may be the first legitimate quality control coverage the hardware has had.

I base this conclusion on my four and a half years experience at Diablo Canyon in Pullman's quality assurance/quality control (QC) program, including two and a half years, through 1982, during which I was the Internal Auditor. The basic lesson I learned is that the conclusions of a Nuclear Service Corporation audit of Pullman are more true today than when first published in 1977--the program does not meet the requirements of 10C.F.R. 50, Appendix B; and it does not have an operative corrective action system. The latter has been demonstrated by the further deterioration in corrective action from 1979-1983. While before, the system was merely failing to identify and solve problems, now it is actively covering them up. This has been especially true with respect to welding, non-destructive examination procedures (NDE), and hydrostatic tests--all of which I learned were consistently uncontrolled, and that some of the procedures for the first two items were not qualified by a testing process which proves the procedures actually work as claimed.

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The system also broke down for vendor quality assurance, where Pacific Gas and Electric (PG&E) management ordered Pullman inspectors to stop reporting cracked welds found in structural steel restraints supplied by vendors such as Boston Bergen and American Bridge.

As an auditor trying to work within the Pullman site and corporate QA system, I learned the cause of the QA breakdown and why it has not been corrected. Pullman QA Management does not want to know about QA/QC violations. Management's corrective action has been to harass, threaten, and intimidate QA/QC personnel who identify problems, and to dismiss those who persist. Although I exhaustively reported deficiencies, the major effect of my disclosures was to prompt orders from the QA manager to only look where I was told, and his angry threats to "get rid of me!" During one such exchange, he exclaimed Pullman's bottom line: we're not committed to building this plant to 10 C.F.R. 50, Appendix B. In that case, I do not see any legal basis for the NRC to allow this plant to operate.

I am not opposed to nuclear power. Rather, I believe in the technology enough to insist that it receive the proper respect. I began working in the nuclear power industry in 1974 at the Trojan Plant and have worked at the Humboldt Bay Plant. With the exception of two months in 1979, I worked at Diablo Canyon for Pullman from September, 1978 until Friday the 13th, 1984, when I was laid off. The layoff occurred the day after I finished a two-month series of disclosures to the NRC.

For my first three to four months on site, I was a documents reviewer. For nineteen months I worked as a weld inspector in the pipe rupture restraint program. In August, 1980, I was promoted to QA Internal Auditor.

My responsibility was to evaluate and monitor the entire QA/QC program for compliance with our legal obligations. This is how I learned that Pullman does not consider 10 C.F.R. 50 a legal obligation for work at Diablo Canyon.

In January, 1983, I was removed as internal auditor, but remained in the QA program to help close out Discrepancy Reports (DR) and Deficient Condition Notices (DCN), as well as to complete my pending audits. QA Manager, Harold Karner, restricted me to carrying out his specific assignments. The harassment was so intense that in mid-May, I resigned. Through my union, the next day I return to Diablo Canyon as a pipefitter. There simply had been too many headaches attempting to work within the corporate system. On my own time, at home, I finished organizing and summarizing my evidence of QA violations. In November, I completed an initial report. On November 28, I sent it to NRC Commissioner, Victor Gilinsky. On December 6, 1983, his office wrote that I would be contacted by the Office of Investigations (OI). Although OI never called, on January 6, 9, and 12, I was interviewed extensively by a series of NRC inspectors from Region V. On January 13, I was laid off.

This statement will summarize the information and list the allegations in three written reports already disclosed to the NRC. My affidavit also is to submit a written record for allegations which I have only described to the NRC in interviews and identify allegations not yet described to the NRC.

I. QUALITY ASSURANCE BREAKDOWN FOR WELDING

With a few exceptions, from the onset of construction, the welding program for structural steel essentially has been uncontrolled--in violation of legal requirements, as well as contract and design specifications. The techniques to circumvent quality assurance included unqualified welders;

unqualified welding procedures; use of welding procedures so irrelevant for the assigned work that, in effect, safety-related welding was widely conducted without procedures; reliance upon unqualified inspection procedures to check the quality of the welds; informal changes of contract specifications without the required administrative review or distribution; falsification of records; and harassment and intimidation of QA personnel who identified and attempted to obtain corrective action against the violations. The abuses occurred both during original construction, and during the current modifications due to the Bechtel/PG&E seismic design review program.

The list below represents a more detailed summary of the allegations and evidence that form the basis for the above conclusions.

1. Weld procedure Code 7/8 for piping and plates has been used improperly to weld numerous forms of structural steel on pipe supports. What happened is that Pullman substituted American Society of Mechanical Engineers (ASME) pipe welding procedures for the American Welding Society (AWS) structural steel procedures, as implemented. This practice exceeded the legally-approved limitations for use of the procedure. The limits were logical, since the two types of jobs have little in common. Pipe welding involves working around a circumference. In structural steel welding the axis of the weld is on a straight plane (Exhibit 1, at 2).

2. Code 7/8 has been used improperly to weld tube steel on pipe supports. Tube steel involves a different type of metal than the P-1 material covered by ASME procedures. This is significant, because the NRC has identified

use of the same metals as a precondition to use ASME procedures for AWS work. In fact, tube steel welding is so unique that the AWS Code has a special section for it (Id., at 2-3).

3. Code 7/8 was improperly used to weld threaded weld studs which bolt plates to civil steel on Class I safety-related pipe supports. The type of welding used for these studs is not listed within Code 7/8, and it bears almost no resemblance to the work legally covered by Code 7/8 (Id., at 2).

4. The welding for threaded studs did not even honor the requirements of Code 7/8, which calls for the use of a backing bar. Instead, process sheets operated by the construction department imposed backgrinding, which is a totally different operation (Id.).

5. Code 7/8 has been used to weld at least eight pipe support joint configurations, including flare bevel groove welds, and double bevel groove welds, not covered by Code 7/8. Each of these configurations represents a unique welding task and legally must have its own approved weld procedure specification detailing the joint configuration (Id., at 3).

6. Process sheets that guide quality control coverage did not consistently call for inspection to verify the fitup of flare bevel groove welds; one of the joint configurations not covered by the 7/8 procedure in the first place. That leaves the quality of the ensuing welds doubly unreliable. This uncontrolled work has been occurring as part of the current design modification construction work (Id.). I have read a PG&E memorandum asserting that QC fitup inspections are not required for flare bevel welds. That memorandum is not sufficient to overrule engineering

specification ESD 264, which requires inspections of groove welds and full penetration welds.

7. Code 7/8 has been improperly used on pipe rupture restraints to weld five types of metal different from the ASME approved P-1 material. These restraints prevent a pipe ruptured during an earthquake from whipping back and forth, which could damage the rest of the equipment (Id., at 4).

8. Code 7/8 was improperly used to weld two structural steel shapes on pipe rupture restraints that are not covered by the procedure--W shapes and tube steel (Id.).

9. Code 7/8 was improperly used for at least 11 joint configurations not covered by the procedure itself. These joint configurations were not generically prequalified per the AWS Code and were without Procedure Qualification Records and/or were not detailed on the Weld Procedure Specification (Id., at 4-5).

10. The result of the procedural breakdown was uncontrolled welding. To illustrate, in one example, pipe rupture restraint square groove welds were conducted without any established or documented procedure that applied to the work in question. In some instances, welds had been completely removed without any QC record of their disappearance. The records reflected QC accepted welds where none existed. For documented repairs, there was only erratic QC coverage due to unexplained procedural changes that deleted the requirement for nondestructive examinations (Id., Attachment 2).

11. Pullman has recognized the error of applying ASME welding procedures to AWS work in an uncontrolled manner and issued Welding Technique Specification No. AWS 1-1, in an attempt to clarify the proper use of Code 7/8 on AWS work. But the scope of corrective action was inadequate. It only covered the work in a weld crack repair program on pipe rupture restraints (Id., at 5-6). The misuse of Code 7/8 far exceeds the use of AWS 1.1. The crack repair program only covered about one-fourth of the pipe rupture restraints, and none of the pipe supports.

12. AWS 1-1 failed to fully correct the improper use of Code 7/8 for welding in the weld crack repair program. The procedure uses a steel not contained in the list of acceptable AWS base metals, without evidence that it had been individually qualified to prove its reliability (Id., at 6).

13. The above violation was approved on December 20, 1979, by V. J. Casey, who signed off as Cognizant Welding Engineer. Sixteen days earlier, however, he had been appointed Pullman's Assistant QA/QC manager, according to an interoffice memorandum. To my knowledge, Mr. Casey has never been listed on the Pullman organizational chart as a Cognizant Welding Engineer. The only way his approval would not represent a false statement is if he were simultaneously a construction and QA official. That would be a violation of the NRC's requirement for a QA program independent of construction (Id., at 6-7).

14. I also have serious reservations about Mr. Casey's qualifications, based on his judgment in the field.

He instructed me to measure fillet welds by the throat, when the AWS Code requires the measurements from

the leg of the weld. For approximately two months, I inspected welds to the wrong standard, because Mr. Casey gave me a makeshift gauge not designed to measure fillet welds. Other inspectors informed me that Mr. Casey has changed the rules on the spot for equipment anchor modifications in the containment. They stated his instructions were to work to a "relaxed" engineering specification ESD 243.

15. Through loopholes in its Engineering Specification ESD 223, Pullman improperly exempted itself from AWS design, fabrication, and erection requirements for all structural steel pipe support welding. Writing off the rules in this fashion violated the PG&E contract specifications. To my knowledge, there is no documented authorization from PG&E to deviate from the Code requirement, which is still in the contract (Id., at 7-9).

16. PG&E contract specifications on welder qualifications were changed without required review and authorized approval. The rules were changed through a cryptic, unexplained note. The changes involved the qualifications standard for all rupture restraint welders before July 10, 1979. The use of ASME qualification standards for welders doing unrelated AWS work mirrors the breakdown in welding procedures. Again, however, the 1979 corrective action only applied to rupture restraints (Id., at 9-12).

17. The PG&E contract requirement for Charpy, or notch impact strength tests, was waived for Code 7/8 and other welding procedures. Charpy tests are necessary to be sure the welds installed under the procedure can meet relevant design and professional code requirements for strength. Deleting this requirement was a serious step, which should have gone through the Contract Specification Change Notice process to assure proper engineering review and approval. Instead, in January, 1974, a PG&E piping superintendent

removed this significant QA check with a one-word penciled response, "No", when Pullman asked in a letter if weld procedures for rupture restraints required Charpy impact tests (Id., at 12-13).

18. In violation of still unrevised contract specifications, specific corrective action commitments on relevant Nonconformance Reports (NCR), and relevant procedures for the weld crack repair program, none of the full penetration welds less than 9/16 in. thick among rupture restraints were ultrasonically tested. This means that the welds in rupture restraints since July, 1979, were not fully covered by quality control tests in a significant number of cases. PG&E engineers accepted the loopholes to Pullman's program in July, 1979, again without the required review and approval, and without revising the relevant contract specification that was being ignored (Id., at 13-15).

19. Another weld procedure, Code 88/89 for carbon steel piping, has been used to weld pipe support structural steel shapes and plates during both original construction and repair work in the current design modifications. Structural steel shapes and plates are not covered by Code 88/89 (Id., at 16).

20. In violation of the contract specification, Code 88/89 has been used to weld carbon steel plates and structural steel shapes to rupture restraints with two welding processes, Shielded Metal-Arc Welding (SMAW) and Gas Tungsten Arc Welding (GTAW). GTAW is not covered by the relevant AWS Code (Id.)

21. In August, 1979, PG&E issued Welding Technique Specification No. AWS 1-3 to clarify the use of Code 88/89 for AWS welding. Unfortunately, the "solution" again repeated the problem. AWS 1-3 covers a welding process, (GTAW) and a base metal (A-515) not covered by the relevant AWS code provision (Id., at 16-18).

22. Pullman also substituted welding procedure Code 92/93 for pipe rupture restraints when the process sheets specified that the work would be done to Code 7/8. The Pullman Assistant QA manager accepted the switch in an August 15, 1978, memorandum without changing the process sheets-- which left a record of work to a different procedure than was actually used. (Id. at 18). The only records accurately reflecting the weld procedure used were the weld rod requisition forms (Id., at 21-22).

23. The informal approval of the welding procedure switch was based on a false premise--that both procedures were qualified to unlimited thickness and were technically equivalent. In fact, they only bear a passing resemblance. For example, Code 7/8 does not include a type of welding in Code 92/93 that is only universally approved by the AWS for welds up to 1/4 in. thickness. Nor did Code 92/93 have its own procedure qualification test to verify its reliability on the welds greater than 1/4 in. thick. In effect, that welding was uncontrolled and its quality is legally indeterminate. The two welding procedures are also different with respect to joint configurations, joint details, tacking the joints, weld processes to be used, backing bar requirements, and welding techniques, such as the allowable heat input from AMPS and maximum volts. The controls for clearly distinct special processes cannot be legally intermingled through a memorandum (Id., at 18-21).

24. Contrary to contract specifications, welders qualified to ASME-based Code 92/93 were used for structural steel welding without being properly qualified to the AWS Code. The switch was accepted on August 15, 1978, Interoffice Correspondence, rather than through an accountable procedure with review, authorized approval and a Contract Specification Change Notice (Id., at 20-21).

25. An April 14, 1983, Discrepancy Report on 1972 welding in the Spray Ring Piping System for the Unit No. 1 containment dome, DR #4713, failed to identify an organizational breakdown far more significant than the issue it disclosed (variations between the SMAW weld process used and the process reported in the process sheets). DR #4713 also revealed that the process sheets and rod requisition forms referenced different weld rods than had, in fact, been used. The response of the QA/QC manager was to accept the violation as is. The DR did not mention one of the most significant violations: the production department substituted an unauthorized, unapproved procedure and process for the procedure which had been properly selected and approved by the QA system and the third party authorized inspector from the State of California. This was done in order to avoid delays when QA issued the wrong weld rod for Weld Procedure 128. Production could not wait to correct the weld rods, so the foreman just changed the procedure. In other words, the production department's "solution" was to achieve compatibility by making the procedure as wrong as the weld rod. DR #4713 endorsed the procedure switch (id., at 23-25). If production can overrule the QA system so easily on such casual grounds, it means that controlled welding procedures occurred only when tolerated by the construction department. Under the circumstances there can be no basis for confidence that the quality of the welding was controlled. Most significant, in April, 1983 Diablo Canyon management was still satisfied with this result.

26. DR #4713 missed another equally significant violation: QC inspectors had approved all the welds after visual examination, although the GTAW and SMAW welding procedures do not look the same. The 1972 failure raises serious questions about the reliability of QC inspections at the

time. The failure of DR #4713 to even note the QC inspection failure demonstrates that 11 years later, the acceptance standards have not yet become realistic. Significantly, before it was issued, this DR was reviewed three times by Bechtel and PG&E management, which must assume responsibility for a QA report that failed to disclose, at all, the most significant QA violations (Id., at 25-28).

27. The breakdown in records for the weld rod and weld process sheets render it impossible to verify the qualifications of early welders by reconstructing weld rod and process records, as asserted by Pullman in response to 1977 Nuclear Services Corporation findings that the qualifications could not be established for welders in late 1972. I demonstrated this effect of DR #4713 by applying its findings to a case study on a welder whose qualifications were challenged in the original NSC audit (Id., at 28-30).

28. My attempts to perform my audit duties on welding led to sustained management hostility, including restrictions on my organizational freedom, harassment and intimidation, and retaliation through personnel actions. On January 28, 1983, the harassment reached a climax. I had already been removed as internal auditor on pretextual grounds (infra., at 23-4) and was doing research for pending audit reports that I had issued, in this case Unscheduled Internal Audit #35 on pipe rupture restrainers. I was at my desk reviewing the records on three full penetration welds that had been tested to the wrong nondestructive examination process. Mr. Karner approached and wanted to know what I was doing. When I told him, he asked if I had been directed to identify those problems. Because I was completing a pending audit of which Mr. Karner disapproved, I accurately answered, "No." He then shouted at me that I was no longer the internal auditor and could no longer identify

discrepancies unless he specifically ordered me to. At the time, I was still a quality assurance employee, helping to close out DCN's and DR's. Mr. Karner's orders to restrict my inquiries violated the requirement for organizational freedom in 10 C.F.R. 50, Appendix B.

29. During the January 28, 1983, confrontation, Mr. Karner also threatened that if I repeated this type of behavior, he would "get rid of me." From his demeanor, I was unsure whether he was referring to my presence on the job, or my presence--period. Mr. Karner's threats eventually convinced me to resign and to take a pipefitting job. The pervasive atmosphere of intimidation was too counter-productive for an employee to successfully uphold required QA/QC standards within Pullman's quality assurance program.

30. Although Pullman has gotten rid of me, the company has kept the problem of unqualified welding procedures. When I left in January, 1984, we were still working to the same welding procedures I had audited. Nothing has changed except that after all the notice, it is clear that Pullman and PG&E's violations are deliberate. There can be no excuse of ignorance. Corrective action has been nonexistent or ineffective. There were discussions on-site of attempting to qualify Code 7/8 after the fact, which would have been ineffective anyway since it was the sponsoring procedure for considerable work that it did not describe. As of my departure, however, even that halfway step had not occurred.

II. QUALITY ASSURANCE BREAKDOWN IN NONDESTRUCTIVE EXAMINATIONS

Nondestructive examinations to test the welds and other hardware were as unreliable as the procedures to conduct the welding in the first place. The indeterminate quality of the testing process leaves the quality of the

hardware in the same status--indeterminate, at best. In some cases, NDE results were compromised due to simple manipulation at management direction. This phenomenon allegedly occurred when Bechtel and PG&E had the NDE personnel do certain ultrasonic tests (UT) over with a different approach, after the tests had identified a large number of rejectable welds.

A good illustration of the quality assurance breakdown involves 1972 tests used to measure Seismic Class I valves on the reactor coolant pressure boundary for minimum wall thickness in response to an Atomic Energy Commission (AEC) directive. The UT procedure was not qualified by tests to determine its reliability, which was questionable anyway, because the procedure did not measure the entire surface of the valves. There is serious question whether all relevant valves were examined, in part due to conflicting information in the records. Not all the equipment used to measure the valves was traceable and calibrated. The former violation invalidates usage of the equipment. The latter affects the accuracy of UT results by up to 48 percent, when the AEC required 98 percent accuracy. Informal changes of contract specifications, without the required review and approval, again facilitated the QA violations. To my knowledge, corrective action has not occurred.

The unreliability of valve measurements was representative of a general QA breakdown for nondestructive examinations. In Internal Audit 101, I checked 21 such procedures--seven were deficient, representing three forms of nondestructive exams. To date, the most significant problem remain. The basic flaw was that records were not available to demonstrate that test procedures were qualified. After I traced the use of one procedure back to the steam generator feedwater nozzle, the QA manager ordered me not to find out where a related test procedure was used. The response to my disclosure of these problems was to sit on them for over a year. In some instances, there still

has not been effective corrective action. QA management reneged on solutions to which we had agreed. The situation became so frustrating, that I conducted an audit on corrective action and sent the results to Pullman corporate headquarters. The response was to reprimand me for breaking ranks, while the QA violations continued to be ignored. Below is a more detailed listing of related allegations.

31. In some instances, the unreliability of nondestructive examinations is due to manipulation of the test results in order to mask deficiencies. This allegedly occurred in 1982, with respect to tests involving around 230 Unit I full penetration welds--some in the containment--where UT examinations revealed large numbers of rejectable conditions. Witnesses described the defects to me as voids, slag, and lack of fusion in the roots of the welds--which raise questions about weld bonding. I was also informed that Bechtel and PG&E management responded by manipulating the UT procedure in a manner that would lower the number of rejected indications. The welds were then "accept(ed) as is" (Id., at 15).

In other instances, the QA violations are more deeply rooted. The case of Engineering Specification ESD 234 for ultrasonic measurement of valves on the reactor coolant pressure boundary is a microcosm of the breakdown. On January 18, 1982, I initially reported QA violations through Internal Audit #101. I tried again in November, with unscheduled Internal Audit #34. On January 2, 1984, I finished a report to Commissioner Gilinsky on this still uncorrected problem, which I have since forwarded to the NRC inspectors at Diablo Canyon. It is enclosed as Exhibit 2.

32. There is no evidence that the ultrasonic thickness measurement

procedure was qualified through tests to demonstrate the 98 percent level of accuracy required by the AEC. The valve measurements were conducted with an uncontrolled procedure, and therefore cannot be accepted as the basis for conclusions about the quality of the valves. In my audit, I could neither find evidence of a Procedure Qualification Record (PQR), nor a Procedure Qualification Test (PQT) (Exhibit 2, at 2-3).

33. There is no evidence of "procedure verification tests," required by ESD 235 for the transducers, that take into account the curves, ridges, and irregularities that exist on every valve and significantly affect the measurements (Id., at 3).

34. Management appears to have conducted the measurements without any qualification test, despite prior warning that the procedure was too unreliable to support its findings. An April 17, 1973, "Interoffice Correspondence" had disclosed:

3. The transducers available are adequate for flat smooth surfaces. There are no adapters, shoes or wedges available should they become necessary.
4. At this time, it appears the transducers supplied may not be the correct type for thickness readings. If this is true, we will have to order new transducers.
5. The effect of surface contour and roughness must be tested prior to making any reportable results.
6. There is no available equipment on the U.T. equipment for review.

It is doubtful that any meaningful results can be obtained at this time and it is definite that none can be reported until the above-mentioned problems are solved.

(Id., and related attachments)

35. Pullman QA manager Harold Karner improperly refused to take corrective action in January, 1982, when I disclosed the lack of procedure qualification records or tests for ESD 236 and ESD 244, the UT Thickness Gauge Procedure. The problem remains uncorrected. His excuse was that these procedures were only nondestructive measurements rather than nondestructive tests, and therefore did not represent "special processes" whose quality must be controlled (Id., at 4).

That semantic distinction is irrelevant. The reason to require reliable, controlled procedures is to assure the quality of sensitive, safety-related hardware. Indeed, in 10 C.F.R. 50, Appendix B, Criterion X, the terms "examinations, measurements, or tests" are used interchangeably. The safety-related purpose for qualified NDE procedures is magnified for ESD 236. ESD 236 was instituted in response to an AEC directive to the nuclear industry after discovery of valve problems at a series of plants.

36. Mr. Karner's manipulation of definitions is wrong. UT measurements constitute a special process which must be qualified. They are a special process because they are uniquely created to perform a specific quality-related function. Further, PG&E contract specifications and 10 C.F.R. 50, Appendix B, Criteria IX, "Control of Special Processes," identify nondestructive testing as an example of special processes, not as the boundary of the concept.

37. UIA #34 of 254 Valve Wall Thickness Data Reports demonstrated that the Data Reports are incomplete and, therefore, are not traceable, as required. For example, none listed the size, shape, or manufacturer's designation for the transducers that performed the wall thickness. The ESD

236 Documentation Packages do not provide any information on the testing equipment beyond the serial numbers. In some cases, there were not even serial numbers for the UT machines and the micrometers used as a mechanical backup measuring device (Id., at 5-6).

38. The Data Reports offered unreliable, inconsistent information. For instance, 19 reports listed two different UT machines as having conducted the same valve measurement. Serial numbers for UT thickness equipment and micrometers could not be verified independently. Ten percent of the valves checked physically had serial numbers different from those listed in the Data Reports. In many Data Reports, original information had been whited-out and altered without signature or explanation (Id., at 6).

39. Necessary records to demonstrate calibration of the measuring equipment were not consistently available. To demonstrate the potential effects, on three UT measurements whose accuracy was tested, the pre- and post-calibration checks showed variations of 10 percent, 48 percent, and 2.6 percent (Id., UIA #34, Attachment 5). The maximum error permitted by the AEC was 2 percent.

40. The AEC acceptance standards were violated when valve measurements from equipment that failed minimum reliability standards (#39, supra) were used to accept the valves as sufficiently thick (Id.).

41. Forty-two Data Reports disclosed that the valves were below the minimum thickness, but on the paperwork they were marked as "accepted" without explanation (Id.).

42. In 11 cases, the measurements were incomplete. The records simply skip results for required areas of the valve, such as the flat pad at the bottom (Id.).

43. In 14 valve locations, there was no documented evidence that the valves had been examined at all (Id.).

44. There was no documentation to indicate that weld repairs on the valves were controlled, as required by the AEC. To illustrate the absence of verifiable controls, the Data Reports do not have a requirement to list whether valves were weld-repaired, or the weld procedure used (Id., at 7).

45. During my research for UIA #34, I discovered that none of the valves meet AEC and PG&E design requirements. Westinghouse, the manufacturer, had explicitly declared that they "were not designed to meet the minimum wall thickness requirements of ANSI B16.5"--one of the relevant professional codes listed by the AEC in 1972. By comparing Westinghouse's communication with PG&E contract specifications, I learned that the valves also do not meet the design requirements in the contract (Id.).

46. To my knowledge, there still has not been any corrective action on this problem. If there had been good faith attempts, I should have been contacted as the originator of the audit. I remain available to help follow through.

47. Similar to UT thickness measurement procedures, nondestructive test procedures lacked documentation of Procedure Qualification Records or Tests. In IA #101, I found this flaw in seven procedures out of 21 examined. Beyond the UT thickness procedures, there were five cases where no evidence existed that NDE procedures had been qualified. As a result, the quality of work examined under those procedures remains indeterminate. These included: 1) ESD 234, for UT Inspection of Groove Welds on pipe rupture restraints prior to 1979; ESD 241, for UT examination of Safety Yoke Rods on Safety

Valves; ESD 246, for Magnetic Particle testing, with unknown use; ESD 247, for Magnetic Particle examination of welds in the crack repair program on Unit #1 Steam Generator Feedwater Nozzles; and ESD 270, for Liquid Penetrant examinations, with unknown use. On January 12, 1984, I completed and delivered to NRC inspectors, a draft report to Commissioner Gilinsky on IA 101. It is enclosed as Exhibit 3.

48. The corrective action for procedure ESD 234, consisted of unreliable, "after-the-fact" Procedure Qualification Tests, whose use was not controlled and accomplished using qualified procedures. Ironically, this is the same flaw the late PQT were supposed to correct. Further, there is no evidence that management reviewed and approved the procedures for the PQT (Id., at 2-3).

49. QA Manager Harold Karner improperly prevented any corrective action for the lack of procedure qualification records on ESD 270. Instead, he directed that the Procedure Qualification Records for a similar procedure, ESD 210, should be used for ESD 270. That is unacceptable. If the two procedures have separate numbers, there are at least some dissimilarities. Those unique features of ESD 270 inherently will not have a proven demonstration of their ability to identify defects. This QA violation remains ignored.

50. No investigation was performed to determine where ESD 270 was used. Instead, the QA manager told me to just write up what I had learned already as an audit finding.

51. ESD 241 for UT of the safety valve yoke rods involves the most significant violations. In addition to the lack of a PQR, the hardware was tested from December 17-20, 1973, before the UT procedure itself was even issued on December 26, 1973, and prior to approval of the UT procedure

by PG&E on February 12, 1974. The testing was totally uncontrolled for the yoke rods on these valves, which I believe control the release of radiation from the containment (Id., B at 4).

52. ESD 241 was deficient because it violated instructions from Dresser, the vendor for bolts and studs. The Dresser instructions required the rods to be examined prior to threading. At Diablo Canyon, the UT's were conducted after the threading. Further, ESD 241 did not use the Dresser instructions to determine the reference point for sensitivity and the criteria to report questionable items (Id., at 4-5).

53. The existing documentation for the tests fails to meet the standards both of ESD 241 and the Dresser Instructions. Required information on the testing surface and instrument calibration was not included (Id., at 5).

54. Both ESD 241 and the UT inspection records failed to reflect compliance with a PG&E-imposed requirement for backup inspection "with the liquid dye penetrant technique to check the yoke rod ends for indications of cracking that might extend into the threaded area of the yoke ends" (Id., at 5-6).

55. No DR was issued to PG&E on ESD 241, although this corrective action had been agreed to both by Mr. Karner and the NDE supervisor. Mr. Karner improperly reneged on the basis of a memorandum from John Guyler,

Mr. Guyler dismissed the detailed, documented DR which I had proposed with the following assertion: "PPP has accomplished this per instruction from PG&E. It is evident that a nonconformance does not exist and a DR is not necessary" (Id., at 3-4). Mr. Guyler's response was inadequate. First, the procedure violated PG&E instructions (see #54, supra). Second,

even PG&E does not have the authority to validly instruct Pullman to violate 10 C.F.R. 50, Appendix B, Criterion IX--"Special Processes." Third, Mr. Guyler did not document his asserted conclusion.

56. Overall, Pullman violated NRC reporting requirements and PG&E contract specifications by only reporting the deficiencies for two out of the seven nondestructive procedures to PG&E on Discrepancy Reports (Id., at 6).

57. PG&E dispositioned the DR for ESD 246 "accept as is", although there is no information indicating where the nondestructive test was conducted. Since the identity of the affected hardware could also impact on the evaluation criteria, PG&E's acceptance was premature (Id., at 7).

58. The reason the location of work tested under ESD 246 could not be identified is that Mr. Karner improperly prevented me from looking. After I learned that ESD 247 was used for welds in the crack repair program on feedwater nozzles in the Unit I Steam Generator, he ordered me not to check where ESD 246 had been used (Id., at 6).

59. PG&E improperly dispositioned the DR on ESD 247 "accept as is", although the Magnetic Tests in the procedure were referenced to AHSI standards, rather than the relevant ASME Code Section I; and although the qualifications of the MT personnel conducting the test cannot be verified from the records available (Id.).

60. The corrective action for ESD 246 and 247 involved procedure qualifications after-the-fact (Id., at 7). After-the-fact procedure qualifications should not excuse PG&E from accountability under NRC rules. At best, it means that the damage has been minimized. But it also inherently means that

10 C.F.R. 50, Appendix B, was violated, because special processes were conducted under uncontrolled conditions.

61. Even if it is acceptable to conduct procedure qualification tests after the fact, the tardy test must be performed under controlled circumstances. In this case, PQT's were conducted with different equipment than had been used originally (Id.). No documentation was supplied to support the asserted Corrective Action Response that the new equipment made the results more conservative.

62. QA Manager Karner was responsible for the deliberate failure to provide reasonably prompt corrective action for IA 101. On January 18, 1982, I initially disclosed IA 101; on March 23, 1982, it was finalized after I provided Mr. Karner with additional information which he had requested. On April 6, 1982, corrective action for the first finding in the audit on lack of procedure qualification tests was approved. Before implementation, however, he changed his mind. Although the official time limit for corrective action is ten days, the audit was not closed out for over another year, despite my repeated memoranda and attempts to formally notify Mr. Karner of his obligation to address the issue of unqualified NDE procedures (Id., at 8-11).

63. Pullman corporate QA Director A. Eck was notified of the failure to take corrective action and improperly refused to help. Instead, he reprimanded me for bringing the matter to his attention. On June 14, 1982, I notified Mr. Eck, through an Interoffice Correspondence, of the overdue corrective action. He did not respond. On July 6, 1982, I performed and submitted Unscheduled Internal Audit #31 to Mr. Eck on the lack of corrective action required by ESD 263 within 10 days. This time I received a response. Both Mr. Eck and Mr. Karner reprimanded me for submitting the audit to Mr. Eck directly, rather than letting it proceed through the chain of command.

This violated ESD 263, they explained. My audit was voided. Both individuals neglected to mention the violation of ESD that I had raised - the QA violations were not getting fixed (Id., at 9-10).

64. In January 1983, I was further punished for Mr. Karner's improprieties. I was removed as internal auditor because only 5 instead of the required 18 audits had been closed out. Part of the problem was due to circumstances beyond my control. Mr. Karner or supervisors were sitting on some of my audits beyond the required deadline. Mr. Karner also was loading me down with ancillary assignments and unscheduled audits were not counted.

65. On January 28, 1983, during the meeting in which Mr. Karner threatened to get rid of me for looking at quality -related issues without being assigned (Supra, Nos. 27-28), I informed Mr. Karner that he had violated 10 C.F.R. 50, Appendix B. He responded twice that we are not committed to 10 C.F.R. 50, Appendix B, and that it was "O.K." for him to violate the Code of Federal Regulations and related contract specifications.

III. BREAKDOWN IN QUALITY ASSURANCE FOR HYDROSTATIC TESTS.

Hydrostatic testing at Diablo Canyon from 1975 to 1978 does not have the necessary QA documentation to prove the reliability of the tests. In hydrostatic tests, water is run through the plant at higher pressures than normal to see if the piping is reliable.

In February 1981, I conducted Internal Audit 86, in which I learned that nearly all hydrostatic piping tests for a year, during 1980 and 1981 were conducted without required QC documentation. In April 1982 NRC inspection identified that documentation problems identified

in Internal Audit-86 were not properly corrected. I became convinced that serious problems may exist with the hydrostatic tests. In March 1983 I completed Internal Audit 106, which examined the records for 79 original hydrostatic tests and 118 retests conducted from 1975 onward. I learned that the test documentation did not have evidence of required QC oversight, QA records, consistent procedures, or controlled test conditions. In short, there has been a generic breakdown in the QA requirements for hydrostatic tests. They must be redone. Internal Audit 106 is enclosed as Exhibit 4. My specific allegations follow.

66. The procedures for hydrostatic tests conducted before January 27, 1975 are fundamentally inadequate, due to their failure to include documentation requirements, and due to lost pages, the inability to even entirely reconstruct the procedure requirement.

67. Almost all hydrostatic tests and retests from 1975 onward lack required QA documentation. The most significant omission involves QC coverage documented on a piping system closeout - F98 Department Release. This activity is necessary to assure that departments performing the test comply with procedure checklists. Unfortunately, departments only complied sporadically with the requirement to complete and maintain the form which demonstrates compliance with the test procedure. In other cases, there is not necessary backup documentation to verify the conclusions in the release. (Exhibit 4, AAR #1).

68. From December 1977 - April 1978, in 28 cases Pullman, test requirement forms did not have information necessary under the

procedure ESD 229. Fundamental data, such as the type of fluid, pressure and temperature, simply is missing (Id., AAR #2).

69. In 28 cases, Pullman's HT procedure data form ~~does~~ not match PG&E requirements. This form is the guide used to conduct the test, so the distinctions translated into different test conditions that disqualify the results from Pullman's hydrostatic test. To illustrate, in one test Pullman's procedure only had a pressure of 2485 PSIG, when PG&E's acceptable minimum was 2812 PSIG.

70. The absence of backup documentation continued after 1978. From March 1978 to April 1980, there were 14 hydrostatic retests without a signed QC field pipe release, despite the conclusion by Quality Engineering in the test records that QC had verified the results (Id. AAR #3).

71. The problems with hydrostatic tests offer another example of management harassment of QA personnel. During the May 1982 NRC inspection, I spoke extensively with NRC representatives. After the interview Mr. Karner expressed anger at the length of the meeting. At a later meeting, during this general time frame, he threaten to get rid of me.

IV. BREAKDOWN IN VENDOR QUALITY ASSURANCE.

Although I was not as actively involved with vendor QA as with special process and hydrostatic test procedures, I observed the symptoms of a generic QA breakdown after becoming familiar with two examples of QA violations involving vendors. One case involved a vendor that calibrates micrometers, a precision measuring device for Pullman tools and the impact of weld repairs, among other functions. Although the vendor had a clean bill of health and was on the Approved Vendors

List (AVL) until my October 1981 audit, there was virtually no quality assurance program. Unfortunately, corrective action was solely prospective - to remove the firm from the AVL. The damage that already has been done will remain.

The second case involves 1980 and 1982 orders by PG&E for Pullman inspectors to stop reporting the large number of cracked shops welds found in Boston Bergen and American Bridge work. These hardware defects should have been reported on DR's, but instead were ordered to be ignored because they came from a vendor. Specific allegations follow.

72. The reliability of Pullman's Approved Vendors List is indeterminate, due to the inclusion of Microsurface Engineering. This firm only had a token quality assurance program, yet had been approved and passed previous vendor audits. My audit demonstrated that Microsurface did not conduct audits, did not have a written procedure for calibration, conducted uncontrolled inspections, lacked traceability for use on Pullman tools, failed to disclose laboratory standards for calibration, and did not have required documentation for training of laboratory personnel. The violations were so ingrained and pervasive that it is not credible to conclude they only sprang up since the vendor passed an audit the previous year.

73. Corrective action for the Microsurface QA violation improperly was restricted to the prospective step of removing the firm from the AVL. This was inadequate, because the accuracy of measurements made with Microsurface tools is indeterminate. The effects of previous violations will remain undisturbed.

74. In July 1979 Pullman inspectors began finding significant quantities of cracks in welds received from two vendors, Boston Bergen and American Bridge. Until 1980 Pullman inspectors wrote 19 Discrepancy Reports on the welds, which displayed a consistent pattern of linear indication. The DR's are enclosed as Exhibits 5-24. On April 3, 1980, however, Mr. Marvin Leppke of PG&E issued a memorandum directing Pullman to stop issuing Discrepancy Reports on these "shop" welds. The memorandum is enclosed as Exhibit 25.

75. In 1982 PG&E repeated the improper restrictions on QA enforcement against the same shop welds. This time PG&E instructed Pullman to delete shop welds from the formal walkdown program that represents a final visual check on quality. Relevant supporting documentation is enclosed as Exhibit 26.

V. RECORDS FALSIFICATION

Beyond instances of contradictory and impossible information in the records, in some cases I am sufficiently familiar with the circumstances of false records to state that they were intentionally falsified. Examples involve the qualifications tests for QC inspectors. As a prospective welding inspector I failed one of my initial test and was then given a copy of the test to study to assure passing on the second attempt. Another inspector was certified after taking a test which upon review months later he was found to have failed. He was retested at that time and passed with the assistance of coaching. The test was backdated to the original test date to cover work performed during the intermin period. The latter example occurred in 1980.

VI. CAUSES OF THE QUALITY ASSURANCE BREAKDOWN.

77. The most significant cause for the QA breakdown is the environment of repression and the predictable retaliation against QA personnel who diligently try to identify and correct QA violations. The problem goes well beyond the loss of organizational freedom. Upholding the Atomic Energy Act at Diablo Canyon can represent professional suicide. Most significant, the sacrifice is for nothing. The violations remain, uncorrected. My own experience is a case study. Mr. Karner threatened to "get rid of" me on three occasions when I persisted in attempts to obtain corrective action. Mr. Karner restricted my freedom as an inspector until I could only look at specific problems assigned by him. I was reprimanded, verbally and in writing, for communicating with corporate QA management about such a fundamental violation as the failure to take corrective action against unqualified NDE procedures on safety related work. To add insult to injury, in January 1983 I was demoted for not finishing enough assignments. The demotion was due in part to Mr. Karner's refusal to act on my audits, which made it impossible in some cases for me to finish my assignments.

78. The final act of reprisal against me occurred on January 13, 1984. I was laid off from my job as a pipefitter, the day after making my third disclosure to the Nuclear Regulatory Commission. NRC inspectors already had told me that site management had a copy of my first report on welding procedures, and that Bechtel was studying it. On Friday, 50 pipefitters were laid off, supposedly due to a lack of parking space. The usual practice for these layoffs is to let workers from the local union stay until last. In this instance 46 out of the 50 employees laid off were "travel cards"

from out-of-town unions. Although more travelers were available, four employees from the local were swept out with the travelers. One of the four was having conflicts with his supervisor and one had an absenteeism problem. The other two were my partner and myself. My foreman protested to the supervisor not to lay off my partner and me, and asked for permission to pick someone else. The supervisor referred him to the resident construction manager, who refused the request and told the job steward that we had to be the ones laid off. My foreman and the job steward recounted these events to me on the day of the layoff. That day the job steward also informed me of the perception of site that my layoff was due to "politics" and was decided "higher up". On January 25, 1984, the day after retaliation was widely discussed at Congressional hearings, management called me back to work but not my partner. The pattern represented by my case illustrates why a significant number QA violations have gone unreported, and why the quality of Diablo Canyon is indeterminate. Those who persist in reporting the violations are dismissed, or harassed relentlessly until they resign, or give up and stop trying.

79. Another cause for the QA breakdown is subordination of PG&E's and Pullman's QA department to construction. Until recently, PG&E site QC did not review Pullman Discrepancy Reports. PG&E's Resident Mechanical Engineer, a construction official, reviewed and approved corrective action to discrepancies. As of May 1983, Pullman Internal Audits were not submitted to PG&E site QC for review but instead submitted to the Resident Mechanical Engineer.

80. Another cause for the QA violations was lack of resources. To illustrate, from August 1980 to September 1982, Mr. Karner was the only permanent employee in the QA/QC site management. He did not have an assistant QA Manager, and the QC Supervisor was a temporary employee.

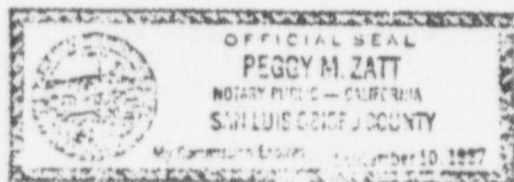
81. The QA breakdown was not due to PG&E ignorance. On

repeated occasions, I identified many of the issues in this affidavit to a variety of officials within the PG&E supervisory and management staff. Although some officials listened and expressed agreement and/or sympathy, none of the violations were corrected. I believe that PG&E and Pullman have been gambling that the NRC will not enforce the QA laws, even if they are caught. For the sake of the public's health and safety, I hope that the NRC calls their bluff.

I have read the above 31 page affidavit, and it is true, accurate and complete to the best of my knowledge and belief.

Harold C. Hudson
Harold Hudson

SUBSCRIBED AND SWORN this 1st day of January, 1984, in San Luis Obispo, California.



Peggy M. Zatt
NOTARY PUBLIC
My Commission Expires: J

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PACIFIC GAS AND ELECTRIC COMPANY

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J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

March 8, 1984

PGandE Letter No.: DCL-84-097

Mr. John B. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission, Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

FILE COPY

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
SECY-84-61, Item 132
Welding of Attachment Plates to CCW System Piping

Dear Mr. Martin:

On January 27, 1984, NRC Region V representatives requested information regarding welding of doubler plates on the component cooling water system piping at the heat exchangers. The NRC requested (1) a description of the basis for acceptance of welds made on the component cooling water system piping while the system was filled with water, and (2) the Pullman Power Products Field Process Sheets associated with Drawing No. HGR 18-SR dated November 5, 1983. PGandE's response is provided in the enclosures.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

Enclosures

cc: T. W. Bishop
D. G. Eisenhut
H. E. Schierling
Service List

1984 MAR -9 PM 2:04

RECEIVED

~~8404020097~~ 2PR

05/01/84-84 IE-23
5 23. ~~11-11~~

ENCLOSURE 1

WELDING OF DOUBLER PLATES ON CCW SYSTEM PIPING

The following discussion provides the basis for acceptance of welds made on the component cooling water (CCW) system piping while filled with water.

The review and acceptance of welding to water-filled lines was performed by the cognizant engineer prior to any welding being performed. Welding to the CCW system piping, while filled, was the preferred method due to environmental considerations associated with draining and disposal of chromated water held in the system.

The weld procedure used was Pullman Power Products Weld Procedure 7/8 which is applicable to P1 materials. The CCW pipe is A-53, Grade B material and the attachment plates are A-515, Grade 70 material, both classified as P1 material in ASME Section IX. The weld procedure requires a minimum preheat of 50°F. The CCW system was at a temperature well above 50°F; therefore, preheat requirements were satisfied.

The main concern with welding to water-filled lines is the possibility of cold cracking. Since the primary agent which can cause cold cracking in the weldment is hydrogen, the weld procedure used dictates a low hydrogen weld rod (E 7018) which minimizes hydrogen and, therefore, minimizes the possibility of formation of cold cracks.

The sections welded were thin sections (0.375" pipe wall and 0.375" to 0.625" attachment plates) which assures a relatively even temperature gradient during the welding process and eliminates the possibility of cracking occurring.

Because of the above, welding to the CCW piping while the system is filled with water is acceptable.

ENCLOSURE 2

The following Pullman Power Products Field Process Sheets and related documentation are associated with Drawing No. HGR 18-5R dated November 5, 1983, and welding of attachment plates to the component cooling water piping (the information listed below has been provided to NRC Region V representatives).

- | | | | | |
|-----|--|-----------------------|-------------------|------------------------------|
| 1. | PPP-FPS | HGR 18-5R | Field Weld X1377A | Date 11/05/83 |
| 2. | PPP-FPS | HGR 18-5R | Field Weld X1377B | Date 11/05/83 |
| 3. | PPP-FPS | HGR 18-5R | Field Weld X1377C | Date 11/05/83 |
| 4. | PPP-FPS | HGR 18-5R | Field Weld X1377D | Date 11/05/83 |
| 5. | DC-1-E-P-9041-R-0 | | SK-18-SR | Sheets 14, 15 and 16 |
| 6. | PPP-FPS | HGR 18-5R | Field Weld X1414A | Date 11/05/83 |
| 7. | PPP-FPS | HGR 18-5R | Field Weld X1414B | Date 11/05/83 |
| 8. | PPP-FPS | HGR 18-5R | Field Weld X1414C | Date 11/05/83 |
| 9. | PPP-FPS | HGR 18-5R | Field Weld X1414D | Date 11/05/83 |
| 10. | PPP-FPS | HGR 18-5R | Field Weld X1414E | Date 11/05/83 |
| 11. | PPP-FPS | HGR 18-5R | Field Weld X1414F | Date 11/05/83 |
| 12. | PPP-FPS | HGR 18-5R | Field Weld X1414G | Date 11/05/83 |
| 13. | PPP-FPS | HGR 18-5R | Field Weld X1414H | Date 11/05/83 |
| 14. | Pipe Support Design Tolerance Clarification Form,
Seq. No. TC-1-8578 dated 07/02/83, with 08/12/83 comments | | | |
| 15. | PPP-FPS | Mark No. DCN 1604-006 | | Date 11/05/83 |
| 16. | Deficient Condition Notice No. 1604-006 | | | Date 11/02/83 |
| 17. | PPP Liquid Penetrant Examination Record ISO 1-14-5
DCN 1604-006 R-0/1-K-104-20 | | | Date 08/11/83 |
| 18. | PPP Thickness Report ISO 1-14-5 HGR 18-5R
Part Serial No. DCN 1604-006-R-0 Serial No. 1086 | | | Date 08/11/83 |
| 19. | Pipe Support Design Tolerance Clarification Form,
Seq. No. TC-1-8578, dated 07/02/83 | | | |
| 20. | Field Sketch DCN 1604-006 Sheet 2 of 2 | | | |
| 21. | DC-1-E-P-9041 Rev 1 | | SK-18-512 | Sheets 14, 15,
16 and 16x |

PACIFIC GAS AND ELECTRIC COMPANY

PG&E + 77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6987

J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

Denny

March 8, 1984

PGandE Letter No.: DCL-84-097

Mr. John B. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission, Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
SECY-84-61, Item 132
Welding of Attachment Plates to CCW System Piping

Dear Mr. Martin:

On January 27, 1984, NRC Region V representatives requested information regarding welding of doubler plates on the component cooling water system piping at the heat exchangers. The NRC requested (1) a description of the basis for acceptance of welds made on the component cooling water system piping while the system was filled with water, and (2) the Pullman Power Products Field Process Sheets associated with Drawing No. HGR 18-SR dated November 5, 1983. PGandE's response is provided in the enclosures.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

J. O. Schuyler

Enclosures

cc: T. W. Bishop
D. G. Eisenhut
H. E. Schierling
Service List

1984 MAR -9 PM 2:00

RECEIVED
MAR 9 1984

~~8404020097~~ 840308
PDR ADDCK 05000275
P PDR

3cc

IF-28

ENCLOSURE 1

WELDING OF DOUBLER PLATES ON CCW SYSTEM PIPING

The following discussion provides the basis for acceptance of welds made on the component cooling water (CCW) system piping while filled with water.

The review and acceptance of welding to water-filled lines was performed by the cognizant engineer prior to any welding being performed. Welding to the CCW system piping, while filled, was the preferred method due to environmental considerations associated with draining and disposal of chromated water held in the system.

The weld procedure used was Pullman Power Products Weld Procedure 7/8 which is applicable to P1 materials. The CCW pipe is A-53, Grade B material and the attachment plates are A-515, Grade 70 material, both classified as P1 material in ASME Section IX. The weld procedure requires a minimum preheat of 50°F. The CCW system was at a temperature well above 50°F; therefore, preheat requirements were satisfied.

The main concern with welding to water-filled lines is the possibility of cold cracking. Since the primary agent which can cause cold cracking in the weldment is hydrogen, the weld procedure used dictates a low hydrogen weld rod (E 7018) which minimizes hydrogen and, therefore, minimizes the possibility of formation of cold cracks.

The sections welded were thin sections (0.375" pipe wall and 0.375" to 0.625" attachment plates) which assures a relatively even temperature gradient during the welding process and eliminates the possibility of cracking occurring.

Because of the above, welding to the CCW piping while the system is filled with water is acceptable.

ENCLOSURE 2

The following Pullman Power Products Field Process Sheets and related documentation are associated with Drawing No. HGR 18-5R dated November 5, 1983, and welding of attachment plates to the component cooling water piping (the information listed below has been provided to NRC Region V representatives).

- | | | | | |
|-----|--|-----------------------|-------------------|------------------------------|
| 1. | PPP-FPS | HGR 18-5R | Field Weld X1377A | Date 11/05/83 |
| 2. | PPP-FPS | HGR 18-5R | Field Weld X1377B | Date 11/05/83 |
| 3. | PPP-FPS | HGR 18-5R | Field Weld X1377C | Date 11/05/83 |
| 4. | PPP-FPS | HGR 18-5R | Field Weld X1377D | Date 11/05/83 |
| 5. | DC-1-E-P-9041-R-0 | | SK-18-SR | Sheets 14, 15 and 16 |
| 6. | PPP-FPS | HGR 18-5R | Field Weld X1414A | Date 11/05/83 |
| 7. | PPP-FPS | HGR 18-5R | Field Weld X1414B | Date 11/05/83 |
| 8. | PPP-FPS | HGR 18-5R | Field Weld X1414C | Date 11/05/83 |
| 9. | PPP-FPS | HGR 18-5R | Field Weld X1414D | Date 11/05/83 |
| 10. | PPP-FPS | HGR 18-5R | Field Weld X1414E | Date 11/05/83 |
| 11. | PPP-FPS | HGR 18-5R | Field Weld X1414F | Date 11/05/83 |
| 12. | PPP-FPS | HGR 18-5R | Field Weld X1414G | Date 11/05/83 |
| 13. | PPP-FPS | HGR 18-5R | Field Weld X1414H | Date 11/05/83 |
| 14. | Pipe Support Design Tolerance Clarification Form,
Seq. No. TC-1-8578 dated 07/02/83, with 08/12/83 comments | | | |
| 15. | PPP-FPS | Mark No. DCN 1604-006 | | Date 11/05/83 |
| 16. | Deficient Condition Notice No. 1604-006 | | | Date 11/02/83 |
| 17. | PPP Liquid Penetrant Examination Record ISO 1-14-5
DCN 1604-006 R-0/1-K-104-20 | | | Date 08/11/83 |
| 18. | PPP Thickness Report | ISO 1-14-5 | HGR 18-5R | |
| | Part Serial No. DCN 1604-006-R-0 | | Serial No. 1086 | Date 08/11/83 |
| 19. | Pipe Support Design Tolerance Clarification Form,
Seq. No. TC-1-8578, dated 07/02/83 | | | |
| 20. | Field Sketch | DCN 1604-006 | Sheet 2 of 2 | |
| 21. | DC-1-E-P-9041 Rev 1 | | SK-18-512 | Sheets 14, 15,
16 and 16x |

#132

COPY

PACIFIC GAS AND ELECTRIC COMPANY

PG&E +

77 BEALE STREET, SAN FRANCISCO, CALIFORNIA 94106

TELEPHONE (415) 781-4211

March 8, 1984

PGandE Letter No.: DCL-84-097

Mr. John B. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission, Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

Re: Docket No. 50-275, OL-DPR-76
Diablo Canyon Unit 1
SECY-84-61, Item 132
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Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

ORIGINAL SIGNED BY

J. O. Schuyler

Enclosures

cc: T. W. Bishop
D. G. Eisenhut
H. E. Schierling
Service List

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ENCLOSURE 1

WELDING OF DOUBLER PLATES ON CCW SYSTEM PIPING

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Because of the above, welding to the CCW piping while the system is filled with water is acceptable.

ENCLOSURE 2

The following Pullman Power Products Field Process Sheets and related documentation are associated with Drawing No. HGR 18-5R dated November 5, 1983, and welding of attachment plates to the component cooling water piping (the information listed below has been provided to NRC Region V representatives).

- | | | | | |
|-----|--|-----------------------|-------------------|------------------------------|
| 1. | PPP-FPS | HGR 18-5R | Field Weld X1377A | Date 11/05/83 |
| 2. | PPP-FPS | HGR 18-5R | Field Weld X1377B | Date 11/05/83 |
| 3. | PPP-FPS | HGR 18-5R | Field Weld X1377C | Date 11/05/83 |
| 4. | PPP-FPS | HGR 18-5R | Field Weld X1377D | Date 11/05/83 |
| 5. | DC-1-E-P-9041-R-0 | | SK-18-SR | Sheets 14, 15 and 16 |
| 6. | PPP-FPS | HGR 18-5R | Field Weld X1414A | Date 11/05/83 |
| 7. | PPP-FPS | HGR 18-5R | Field Weld X1414B | Date 11/05/83 |
| 8. | PPP-FPS | HGR 18-5R | Field Weld X1414C | Date 11/05/83 |
| 9. | PPP-FPS | HGR 18-5R | Field Weld X1414D | Date 11/05/83 |
| 10. | PPP-FPS | HGR 18-5R | Field Weld X1414E | Date 11/05/83 |
| 11. | PPP-FPS | HGR 18-5R | Field Weld X1414F | Date 11/05/83 |
| 12. | PPP-FPS | HGR 18-5R | Field Weld X1414G | Date 11/05/83 |
| 13. | PPP-FPS | HGR 18-5R | Field Weld X1414H | Date 11/05/83 |
| 14. | Pipe Support Design Tolerance Clarification Form,
Seq. No. TC-1-8578 dated 07/02/83, with 08/12/83 comments | | | |
| 15. | PPP-FPS | Mark No. DCN 1604-006 | | Date 11/05/83 |
| 16. | Deficient Condition Notice No. 1604-006 | | | Date 11/02/83 |
| 17. | PPP Liquid Penetrant Examination Record ISO 1-14-5
DCN 1604-006 | | R-0/1-K-104-20 | Date 08/11/83 |
| 18. | PPP Thickness Report ISO 1-14-5 HGR 18-5R
Part Serial No. DCN 1604-006-R-0 | | Serial No. 1086 | Date 08/11/83 |
| 19. | Pipe Support Design Tolerance Clarification Form,
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| 20. | Field Sketch DCN 1604-006 | | Sheet 2 of 2 | |
| 21. | DC-1-E-P-9041 Rev 1 | | SK-18-512 | Sheets 14, 15,
16 and 16x |

 **EG&G ENERGY MEASUREMENTS GROUP**

San Ramon Operations

2801 OLD CROW CANYON ROAD, SAN RAMON, CA • TEL (415)837-5381 • MAIL BOX 204, SAN RAMON, CA 94583

In reply please refer to: WOW: 84-06

5 December 1983

Mr. Dennis Kirsh
U. S. Nuclear Regulatory Commission
1450 Maria Lane, Suite 210
Walnut Creek, California 94596

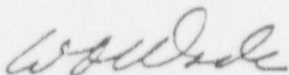
Subject: INSPECTION STATUS REPORT
Reference: Memo; D. Kirsh to W. Wade dated 30 November 1983

This report provides the information requested in the reference memo. Attachment 1 tabulates the information by category with the exception of concrete expansion - anchor bolt data which is not available. Anchor bolts were inspected against the appropriate Foley or Pullman specifications (QCP9, QCPE9, and ESD 223) when they were used for the installation.

Aside from population data, the information was derived from records maintained for the inspections conducted under FIN B-8552. The inspections were conducted between July and November 1983 and some are incomplete. As a consequence, a description of the discrepancy and an assessment of the significance is provided only for completed inspections.

Attachment 2 illustrates the information stored in the data file for this project. The computer was asked to list all completed inspection items having a discrepancy for which a quality assurance (QA) report and/or a citation has been initiated. Incomplete inspection items for which QA reports have been initiated were also added since these reports provide the descriptive information needed to assess significance.

If further explanation or additional information is required please contact me at my office in San Ramon.



W. O. WADE
MECHANICAL ENGINEERING DEPARTMENT

WOW:cog

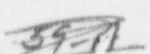
Distribution:

LLNL
G. Cummings
M. Eli
R. Bogdanowicz

EG&G/SRO
R. Pong
A. Debeling
C. Morton

NRC
T. Bishop
P. Narbut
P. Morrill

~~8 7050 7055~~
ape

5 41


DEC. 5, 1983

SUMMARY of DIABLO CANYON INSPECTION *
 of '82 MODIFICATIONS FROM ^{the} INDEPENDENT DESIGN VERIFICATION PROGRAM

CATEGORY	NUMBER OF ITEMS INSPECTED	NUMBER OF DISCREPANC. (INSPECTION COMPLETED)	NUMBER OF DISCREPANC. (INSPECTION INCOMPLETE)	NUMBER OF NON-DISCREP. (INSPECTION COMPLETED)	NUMBER OF MODIFIED SAFETY-RELATED ITEMS IN POPULATION	NUMBER OF SAFETY-RELATED ITEMS IN POPULATION	DISCREPANCY	SIGNIFICANT
ANCHOR BOLTS	-	-	-	-	-	-	M0261 - IMPROPER WELD.	N
DUCTURE RESTRAINTS	11	0	3	8	22	332	-	
ANCHOR BOLTS	-	-	-	-	-	-	M0330 - WELD LOCATION.	N
VVAC SUPPORTS	14	3	1	10	604	1124	M0331 - PROTECTIVE PAINT.	N
ANCHOR BOLTS	-	-	-	-	-	-	M0344 - THREAD ENGAGEMENT	N

* INSPECTION TEAM FROM LAWRENCE LIVERMORE NATIONAL LABORATORY.

DEC. 5, 1983

SUMMARY of DIABLO CANYON INSPECTION*

of '82 MODIFICATIONS FROM ^{THE} INDEPENDENT DESIGN VERIFICATION PROGRAM

CATEGORY	NUMBER OF ITEMS INSPECTED	NUMBER OF DISCREPANC. (INSPECTION COMPLETED)	NUMBER OF DISCREPANC. (INSPECTION INCOMPLETE)	NUMBER OF NON-DISCRIP. (INSPECTION COMPLETED)	NUMBER OF MODIFIED SAFETY-RELATED ITEMS IN POPULATION	NUMBER OF SAFETY-RELATED ITEMS IN POPULATION	DISCREPANCY	STATUS
PIPE SUPPORTS	280	11	6	263	4969	7114	M0023 - AS BUILT ORIENTATION. M0025 - LOOSE ANCHOR. M0029 - TURNBUCKLE LOCKNUTS MISSING. M0047 - NO U-BOLT LOCKNUTS. M0085 - WELD PASS SEPARATION - ANCHOR BOLT ALIGNMENT. M0087 - MISSING WELD. M0088 - UNDOE SIZE WELD. M0138 - STRUT ALIGNMENT M0160 - MISPLACED WELD. M0200 - STRUT ALIGNMENT.	N N Y N N N N N N N N

* INSPECTION TEAM FROM LAWRENCE LIVERMORE NATIONAL LABORATORY.

DEC. 5, 1983

SUMMARY of DIABLO CANYON INSPECTION *
 of '82 MODIFICATIONS FROM ^{the} INDEPENDENT DESIGN VERIFICATION PROGRAM

CATEGORY	NUMBER OF ITEMS INSPECTED	NUMBER OF DISCREPANC. (INSPECTION COMPLETED)	NUMBER OF DISCREPANC. (INSPECTION INCOMPLETE)	NUMBER OF NON-DISCREP. (INSPECTION COMPLETED)	NUMBER OF MODIFIED SAFETY-RELATED ITEMS IN POPULATION	NUMBER OF SAFETY-RELATED ITEMS IN POPULATION	DISCREPANCY	SIGNIFICANT
STRUCTURAL MEMBERS	58	6	4	48	2130	—	S0003 - WALL PLATE GAF - SPALLED CONCRETE AT ANCHORS. S0046 - ANCHOR BOLT ALIGNMENT. S0049 - INSUFF. WELD LENGTH. S0061 - WELD REINFORCEMENT. S0062 - WELD REINFORCEMENT	N
ANCHOR BOLTS	—	—	—	—	—	—	S0063 - LACK OF FUSION, SLAG INCLUSION, STITCH WELD SAGGING, BASE METAL DAMAGE.	Y

* INSPECTION TEAM FROM LAWRENCE LIVERMORE NATIONAL LABORATORY.

ATTACHMENT 11

LOS NUM	LOC	U N I T	ITEM	PART NUMBER	START DATE	COMPLETE DATE	CRIT	CONTACTS	AFF	STATUS	STATUS DATE	MAN INSP HRS	
0019	AUX BLDG	1	RACEWAY SUPPORT	14/CSR-127-3480	7/13/83	10/19/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL MORRISON	BE FD PB	PHYSICAL MVR-E2625 ACCEPTED	9/23/83 9/23/83 10/19/83	MWE MWE MWE	8.0 7.0
0020	AUX BLDG	- 1	RACEWAY SUPPORT	10/CSR1274328	7/13/83	10/31/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL MORRISON	BE FD PB	RECORDS MVR-E2625 ACC-W/D-BA	9/23/83 9/23/83 10/31/83	MWE MWE MWE	8.0 5.0
0022	AUX BLDG	1	RACEWAY SUPPORT	12/H-115-6-105	7/13/83	8/29/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL HERNANDEZ	BE FD MR	CITATION MVR-E2618 ACCEPTED	8/20/83 8/20/83 8/29/83	MWE MWE MWE	2.0 5.0
0026	AUX BLDG	1	RACEWAY SUPPORT	K-154-1-112	8/05/83	10/15/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL MORRISON	BE FD PB	PHYSICAL MVR-E2653 ACC-W/D-BA	9/15/83 9/15/83 10/15/83	MWE MWE MWE	5.0 8.0
0027	AUX BLDG	1	RACEWAY SUPPORT	9/K-140-4-140	8/05/83	10/15/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL MORRISON	BE FD PB	PHYSICAL MVR-E2653 ACC-W/D-BA	9/15/83 9/15/83 10/15/83	MWE MWE MWE	5.0 7.0
0028	AUX BLDG	1	RACEWAY SUPPORT	9/K-140-4-136	8/05/83	10/15/83	QCP 3 QCP 5A QCP 9 QCP E9	MONTEROLA CAMPBELL MORRISON	BE FD PB	PHYSICAL MVR-E2653 ACC-W/D-BA	9/15/83 9/15/83 10/15/83	MWE MWE MWE	5.0 8.0
0032	CONTAINMENT	1	RACEWAY SUPPORT	246-140-8-E3008	10/15/83		QCP 3 QCP 5A QCP 9 QCP E9	MORRISON CAMPBELL	PB FD	PHYSICAL MVR-E-2698	10/20/83 10/20/83	MWE MWE	5.0
0033	CONTAINMENT	1	RACEWAY SUPPORT	10/F-140-5-965	10/15/83		QCP 3 QCP 5A QCP 9 QCP E9	MORRISON CAMPBELL	PB FD	PHYSICAL MVR-E-2699	10/20/83 10/20/83	MWE MWE	5.0
0039	PENETRAT BLDG	1	RACEWAY SUPPORT	146EW1151313	10/18/83	10/31/83	QCP 3 QCP 5A QCP 9 QCP E9	MORRISON CAMPBELL	PB FD	PHYSICAL MVR-E-2703 ACC-W/D-BA	10/20/83 10/20/83 10/31/83	MWE MWE MWE	3.0 2.0
0043	TURBINE BLDG	1	RACEWAY SUPPORT	11/C-104-B-10	10/19/83	11/17/83	QCP 3 QCP 5A QCP 9 QCP E9	MORRISON CAMPBELL	PB FD	PHYSICAL RECORDS	10/19/83 10/19/83	RMB MWE	7.0 6.0

E0044 TURBINE BLDG	1 RACEWAY SUPPORT 15/A-11	44	10/19/83 11/15/83	QCP 3 QCP 5A QCP 9 QCP E9	MORRISON CAMPBELL	P6 FD	DIMENSION RECORDS MVR E-2704 MVR E-2706 ACC-W/O-BA	10/19/83 RMB 10/19/83 MWE 10/31/83 10/31/83 11/15/83 RMB	7.0 6.0 1.0	
E0075 TURBINE BLDG	1 RACEWAY SUPPORT 45/A-119-5-48		10/26/83 11/01/83	QCP 3 QCP 9 QCP E9	MORRISON MELLO	P6 FD	RECORDS PHYSICAL MVR-E-2711 ACC-W/O-BA	10/26/83 RMB 10/26/83 10/26/83 11/01/83 RMB	1.0 1.0 1.0	
E0077 TURBINE BLDG	1 RACEWAY SUPPORT 50/A-107-7-88		10/27/83 11/02/83	QCP 3 QCP 5A QCP 9 QCP E9	MORRISON MELLO	P6 FD	RECORDS PHYSICAL MVR-E-2713 ACC-W/O-BA	10/27/83 RMB 10/27/83 10/27/83 11/02/83 RMB	1.0 1.0 1.0	
E0078 TURBINE BLDG	1 RACEWAY SUPPORT 50/A-119-2-15		10/27/83 11/02/83	QCP 3 QCP 5A QCP 9 QCP E9	MORRISON MELLO	P6 FD	RECORDS PHYSICAL MVR-E-2714 ACC-W/O-BA	10/27/83 RMB 10/27/83 10/27/83 11/02/83 RMB	1.0 1.0 1.0	
E1002 AUX BLDG	1 RACEWAY SUPPORT CSR-127-4-56		11/08/83 11/17/83	QCP E9	CAMPBELL MORRISON	FD P6	MVR-E-2729	11/17/83 RP	3.0	
E1014 CONTAINMENT	1 RACEWAY SUPPORT H-85-1-42		11/08/83 11/17/83	QCP E9	CAMPBELL MORRISON	FD P6	MVR-E-2729	11/17/83 RP	3.0	
M0023 CONTAINMENT	1 PIPE HANGER 12-196SL		7/07/83 10/12/83	ESD 223	TINKLE BAUDIUSO	P6 P6	RECORDS MVR-M-4542 ACCEPTED	9/02/83 MWE 9/02/83 MWE 10/12/83	8.0 6.0	
<i>*M0025 (see next page)</i>										
M0029 N/A	1 PIPE HANGER 46-9V		7/11/83 7/11/83	ESD 223	HOWELL TINKLE	BE P6	CITATION	7/11/83 ASD RP	1.0 1.0	
M0047 N/A	1 PIPE HANGER 22-396SL		7/13/83 7/13/83	ESD 223	TINKLE HOWELL	P6 BE	DR-5184	7/13/83 ASD RP	2.0 1.0	
M0085 AUX BLDG	1 PIPE HANGER 555-172R		7/19/83 9/02/83	ESD 223	TINKLE GIACOLONI BAUDIUSO	P6 BE P6	PHYSICAL WELD MVR-M4511 ACCEPTED	8/20/83 8/20/83 MWE 8/20/83 MWE 9/02/83	5.0 1.0	
M0087 CONTAINMENT	1 PIPE HANGER 57N-38R		7/20/83 9/02/83	ESD 223	BAUDIUSO TINKLE HOWELL	P6 P6 BE	WELD RECORDS MVR-M4511 ACCEPTED	8/20/83 MWE 8/20/83 8/20/83 9/02/83 MWE	5.0 1.0	
M0088 CONTAINMENT	1 PIPE HANGER 57N-28V		7/20/83 9/02/83	ESD 223	TINKLE GIACOLONI BAUDIUSO	P6 BE P6	WELD MVR-M4511 ACCEPTED	8/20/83 MWE 8/20/83 9/02/83 MWE	5.0 1.0	
<i>*M0138 (see next page)</i>										
M0160	1 PIPE HANGER 73-39R		8/09/83 9/15/83	ESD 223	TINKLE BADICO DOLE	P6 P6 P6	MVR M-4533	9/15/83 RGS CHM	1.0 1.0	
M0200	1 PIPE HANGER 92-103R		8/17/83 9/15/83	ESD 223	TINKLE BADICO DOLE	P6 P6 P6	DR 5144	9/15/83 EWR CHM	1.0 3.0	
M0261 N/A	1 PIPE HANGER 22-547SL		8/24/83 8/24/83	ESD 223	TINKLE LORTIE	P6 BE	MVR 4542	8/24/83 ASD	1.0	
M0330	1 HVAC SUPPORT SKC-HV570		8/11/83 9/20/83	QCP 40	FERESTEDT O'CONNOR	FO P6	IR6827-71	9/20/83 RGS CHM	1.0 3.0	

0331	1 HVAC SUPPORT	5KC-HV568	8/11/83	9/26/83	DCP 40	BERGESTEDT O'DONNOR	FD PE	1R8827-71	9/20/83	R65 CHM	1.0 3.0
0344	1 HVAC SUPPORT	5KC-HV367	8/11/83		DCP 40	NOVACK CARLEON BERGESTEDT	FD FD FD	1R8827-73	9/20/83	R65 CHM	1.0 2.0
0003	CONTAINMENT	1 ANNULUS	6181-C1-13-610	7/14/83	DCP 3 DCP 5A DCP C7 DCP 9	KOHLER KITCHEN BERG	BE PE FG	PHYSICAL	9/15/83		
50046	N/A	1 SWITCH GEAR	6422-T1-13-871	8/25/83	8/31/83	DCP 3	PALARMO	PE	NCR5422272	9/15/83	MWE 5.0
50049	N/A	1 SWITCH GEAR	6422-T1-13-874	8/25/83	8/31/83	DCP 3	PALARMO	PE	NCR 5422-255	8/31/83	AGD 1.0
50061	FUEL HANDLING	1 FUEL HANDLING	6180-F1-13-026-016	9/22/83	10/20/83	DCP 3 DCP 5A DCP C7	KOHLER TINGLEY CANNING MUNRO	BE FD FD BE	WELD NCR-8833 ACC-W/D-BA	10/14/83 10/14/83 10/20/83	MWE 3.0 MWE 2.0
50062	FUEL HANDLING	1 FUEL HANDLING	6180-F1-13-026-116	9/22/83	10/20/83	DCP 3 DCP 5A DCP C7	KOHLER TINGLEY CANNING MUNRO	BE FD FD BE	WELD NCR-8833 ACC-W/D-BA	10/14/83 10/20/83	MWE 3.0 MWE 2.0
50063	TURBINE BLDG	1 TURBINE BLDG	6424-T1-13-794	11/01/83	DCP 3 DCP 5A DCP C7 DCP 9	KOHLER HARRISON BERG MARTINSON KIRSCH	BE BE FD FD NR	WELD NCR 5422-332 NCR 5422-333 NCR 5422-341 NCR 5422-351 CITATION	11/01/83 11/03/83 11/03/83 11/03/83 11/03/83 11/03/83 11/10/83 11/10/83 11/18/83	MWE 16.0 RMB MWE MWE MWE 10.0 MWE 10.0	
M0025	AUX BLDG	1 PIPE HANGER	855-66R	7/07/83	9/15/83	ESD 223	TINKLE SMITH BAUDIUSD	PE BE PE	PHYSICAL	9/02/83	MWE MWE
M0138	TURBINE BLDG	1 PIPE HANGER	384-393R	8/02/83	9/15/83	ESD 223	TINKLE HOWELL	PE BE	PHYSICAL DR-5144 ACCEPTED	9/02/83 9/02/83 9/05/83	MWE MWE MWE

HH

To: Hon. Victor Gilinsky, Commissioner
United States Nuclear Regulatory Commission
1717 H Street
Washington, D.C. 20555

From: Harold Hudson - Former Pullman Power Products Quality Assurance Inspector, Quality Control Inspector, Quality Assurance Program Internal Auditor and Lead Auditor.

Date: 1-2-84

#121 Subject: Report #2 - Quality Assurance Deficiencies in the Ultrasonic Measurement of Reactor Coolant Pressure Boundary Valves for Minimum Wall Thickness Requirements as Requested by the Atomic Energy Commission in their Letter of 6-20-72 to Pacific Gas and Electric Company at the Diablo Canyon Nuclear Plant.

The U.S. Atomic Energy Commission, in 1972, requested Pacific Gas and Electric Company to verify at the Diablo Canyon Nuclear Plant that valves important to nuclear safety installed or to be installed at the facility meet the minimum wall thickness requirements of the specified codes or standards. Major Quality Assurance Program Deficiencies have been identified in the PG&E/W.W. Kellogg (Pullman Power Products) Quality Assurance Records for the Ultrasonic thickness measurement of these valves. The Nuclear Regulatory Commission should review these deficiencies to determine if the use of these valves important to nuclear safety will effect the safe operation of Unit #1 and #2 reactors at the Diablo Canyon Nuclear Plant.

The U.S. Atomic Energy Commission Region V letter, dated 6-20-72, referencing Dockets No. 050-0133, #050-0275 and #050-0323 (see attached Pullman Power Products' Unscheduled Internal Audit # 34, Quality Audit Checklist, page 1) states: "Information obtained during inspections conducted by the Directorate of Regulatory Operations has disclosed a number of facilities have been equipped with valves with wall thickness below the minimum requirements specified by the applicable codes, standards and procurement specifications. In other instances, licenses have not been able to document whether or not their valves met minimum wall thickness requirements". The A.E.C. letter requested PG&E "to verify, through manufacturers records or other suitable means, that valves important to nuclear safety installed or to be installed at your facility meet the minimum wall thickness requirements of the specified codes or standards." The A.E.C. letter indicated that "sufficient demonstration of acceptable wall thickness" would be "documented results of ultrasonic measurement of wall thickness with comparison to specific minimum wall thickness, and documentation that the UT measurement technique is demonstrated to have a maximum error in repeatability and accuracy of not more than 2% of the wall thickness".

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Because PG&E did not have manufacturers (Westinghouse) records concerning valve minimum wall thickness it was decided to ultrasonically measure the valves to determine minimum wall thickness.

PG&E initiated Discrepancy Report #103-R1 (see attached U.I.A. #34, Quality Audit Checklist, page 4) which stated that the individual valves to be measured would be as shown on Westinghouse Letter #PG&E 2080 (see attached U.I.A. #34, Quality Audit Checklist, page 5). The valves identified in the Westinghouse letter are called out as "class 1 valves which make up the reactor coolant pressure boundary" and are part of piping systems designated by PG&E as "Seismic Class 1". M.W. Kellogg (Pullman Power Products) initiated Engineering Specification Diablo (ESD) #236, Ultrasonic Thickness Measurement of Boundary Valves (see attached U.I.A. #34, Quality Audit Checklist, page 13), which was approved by PG&E, to implement the valve body wall thickness measurement by ultrasonic method as requested by the A.E.C.

There are major Quality Assurance Program Deficiencies in the Quality Assurance Records for the ultrasonic thickness measurement of Unit #1 and #2 boundary valves as performed by M.W. Kellogg (Pullman Power Products). There is no documented evidence that the ultrasonic thickness measurements were controlled and accomplished using a qualified procedure. In addition, an audit of 254 Valve Wall Thickness Data Reports found that the traceability of the thickness readings obtained and the calibration of test equipment cannot be assured by the existing documentation.

- A. The ultrasonic thickness measurement of Reactor Coolant Pressure Boundary Valves has not been controlled and accomplished using a qualified procedure.
 1. There is no evidence of a Procedure Qualification Record (PQR) documenting that the ultrasonic measurement procedure (ESD 236) is qualified by a proven demonstration (procedure qualification test) of valve wall thickness measurement. This is a non-conformance to 10CFR50 Appendix B IX and XVII, and PG&E Contract Specification #8711.4.3.23 and 4.3.29 (referenced in ESD 236).
 2. There is no evidence of a Procedure Qualification Record documenting that the ultrasonic measurement technique (ESD 236 Procedure) is demonstrated to have a maximum error in repeatability and accuracy of not more than 2% of the wall thickness as required by the A.E.C. letter of 6-20-72 (page 2, paragraph 2). It is alleged that PG&E/M.W. Kellogg (Pullman Power Products) did not perform a Procedure Qualification Test that demonstrated that ESD 236 had a maximum error in repeatability and accuracy of not more than 2% of the wall thickness. There is no documentation (PQR) in the ESD236 Documentation Packages that records the Procedure Qualification Test. Without the PQR, PG&E/M.W. Kellogg (Pullman Power Products) does not comply with the A.E.C. requirement for documentation.

3. There is no documented evidence of "procedure verification tests" as required by ESD 236.6.7 (see attached U.I.A. #34, Quality Audit Checklist, page 15) to determine that transducers will be of suitable frequency, size, and adopted with shoes, wedges, or saddles as each valve measurement requires. It is alleged that PG&E/M.W. Kellogg (Pullman Power Products) did not perform "procedure verification test" to determine transducer requirements. Without "procedure verification tests" documentation there is no assurance that the transducers used were of a suitable frequency, size, and adopted with shoes, wedges, or saddles as each valve measurement requires. *See Audit Action Required (A.A.R.) #1, U.I.A. #34.*

Complicating the issue is an M.W. Kellogg Inter-office Correspondence, dated 4-17-73 (see attached U.I.A. #34, attachment #6A), that states: "3. The transducers available are adequate for flat smooth surfaces. There are no adaptors, shoes or wedges available should they be necessary"; "4. At this time, it appears the transducers supplied may not be the correct type for thickness readings. If this is true, we will have to order new transducers"; "5. The effect of surface contour and roughness must be tested prior to making any reportable results".

The absence of documented "procedure verification test" to determine the proper transducers to be used, and the IOC report of the absence of adaptors, shoes or wedges, and that transducers supplied may not be the correct type, raise serious QA questions about the transducers used to perform the UT measurement.

There is no documented evidence of the testing of surface contour and roughness for effect as referred to in the IOC. This testing should have been a part of the "procedure verification tests" for which there are no records.

The IOC concludes "It is doubtful that any meaningful results can be obtained at this time and it is definite that none can be reported until the above mentioned problems are solved". Without documented records of "Procedure Qualification Tests" and/or "procedure verification tests", there is no assurance that these problems were resolved.

4. Pullman Power Products Internal Audit #101 (see attached), dated 1-18-82, identified that ESD 236 (UT Thickness Measurement of Boundary Valves) and ESD 244 (UT Thickness Gauge Procedure) did not have any evidence that the special processes were

controlled and accomplished using qualified procedures or that qualification records were maintained to document and assure quality of material and work. There were no "Procedure Qualification Records" on file for these two procedures. It was determined in I.A. #101 by the Pullman QA/QC Manager H. Karner that these two ultrasonic procedures were not nondestructive testing procedures but were used to measure material thickness and therefore did not require "Procedure Qualification Records" (Procedure Qualification Tests).

This is not a valid determination. 10CFR50 Appendix B IX (Control of Special Processes) states "Measures shall be established to assure that special processes, including welding, heat treating and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, etc, and other special requirements". PG&E C.S. # 8711 Section 4.3.23 (Qualification of Processes and Personnel) states "Contractor shall assure that special processes such as welding, heat treating, and nondestructive testing are controlled in accordance with applicable codes, standards, specifications, etc, and that special processes are accomplished by qualified personnel using qualified procedures". All special processes, not just welding, heat treating and nondestructive testing, are to be controlled and accomplished using qualified procedures (Procedure Qualification Test). The determination that ESD 236 and ESD 244 were not nondestructive testing procedures does not exclude the procedures from qualification requirements for special processes.

The ultrasonic measurement of Reactor Coolant Pressure Boundary Valves for body wall thickness (curved surfaces) is a special process. ESD 236, as well as ESD 244, did not conform to 10CFR50 Appendix B IX and PG&E C.S. #8711.4.3.23 requirements for special processes to be controlled and accomplished using qualified procedures. M.W. Kellogg's (Pullman Power Products) ESD236 and ESD 244, do not conform to 10CFR50 Appendix B XVII and PG&E C.S. #8711.4.3.29 requirements to maintain records, such as qualification of procedures and equipment, adequate to document and assure quality of material and work.

Pullman Power Products' QA/QC Manager H. Karner was wrong in his determination that ESD 236 and ESD 244 did not require Procedure Qualification Records (Procedure Qualification Tests). It is alleged that

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this is hopeless rationalization by the QA/QC Manager to cover up a serious breach in the Quality Assurance requirements for special processes as required by 10CFR50 Appendix B and PG&E C.S. #8711.

No corrective action of any sort has been initiated by Pullman Power Products concerning the use of ESD 236 and ESD 244 without Procedure Qualification Records (Procedure Qualification Tests). The Nuclear Regulatory Commission should investigate this Quality Assurance Deficiency and assure a proper corrective action. Without a Procedure Qualification Record there is no assurance that the ultrasonic thickness measurement of Reactor Coolant Pressure Boundary Valves have been controlled and accomplished using a qualified procedure.

- B. Pullman Power Products' Unscheduled Internal Audit #34 (see attached) of 254 Valve Wall Thickness Data Reports found that traceability of the thickness readings obtained could not be assured as required by ESD 236.4.1 and that traceability for certification of equipment calibration from the manufacturer or any calibration organization could not be assured as required by ESD 236.4.2. The Valve Wall Thickness Data Reports did not provide the proper information necessary for traceability (see attached U.I.A. #34 for complete audit findings). The more significant Quality Assurance Discrepancies are listed below:
1. None of the 254 Data Reports audited listed the size, shape, or type designation (manufacturer's designation or description) of the transducer used to perform the valve wall thickness measurement as required by ASTM E114-63, 6.1.2 (referenced in ESD 236.3.2 and 5.1). See A.A.R.# 1.
 2. Most of the Data Reports do list a transducer serial number but ESD 236 Documentation Packages do not provide any information or description for transducers by serial number.
 3. Seven Data Reports do not list a serial number of the UT thickness tester used to make the measurements. See A.A.R.# 2.
 4. Nineteen Data Reports did not list the testing frequency or nominal frequency of the transducers used to make the inspections. See A.A.R.# 1.
 5. Nineteen Data Reports list both the Nortec NDT-120, SN# 12224, and the Branson Sonoray Model 303B, SN# 18060, as the UT thickness tester used to make the valve measurements. But there is only one set of calibration information and valve body wall measurement results for each Data Report. The actual UT equipment used to make the valve measurements cannot be determined for the purpose of traceability. See A.A.R.# 2.

6. Two hundred and seven Data Reports referenced serial numbers for UT thickness tester equipment that could not be traced to documentation for certification of equipment calibration from either the manufacturer or any other calibration organization as required by ESD 236.4.2. See A.A.R.#2.
7. Fourteen Data Reports do not list serial numbers for the micrometers used to check the calibration accuracy on the valves by a mechanical means. The micrometers used to make the valve measurements cannot be determined for the purpose of traceability. See A.A.R.#3.
8. Eighty four Data Reports referenced serial numbers for micrometers that could not be traced to documentation for certification of equipment calibration from either the manufacturer or any other calibration organization as required by ESD 236.4.2. See A.A.R.#3.
9. Six Data Reports do not list any information concerning the step-wedge blocks used for calibrating the UT tester equipment. See A.A.R.#4.
10. Eleven Data Reports do not list pre or post operation calibration information. See A.A.R.#4.
11. Forty two Data Reports indicated the valves as below the minimum allowed wall thickness but the Data Report forms were signed in the item #7 space that indicated the valves were physically marked as acceptable. See A.A.R.#6.
12. Many Data Reports were found to have original information whited out and new information inserted. There are no signatures of persons making the changes or explanations for the changes. See A.A.R.#6.
13. Eleven Data Reports did not have a complete measurement inspection of all areas of the valves as required by the procedure. There is no documentation authorizing the incomplete measurements. See A.A.R.#7.
14. Fourteen valve locations, listed by Westinghouse Letter #PG&E2080 to be measured, had no documented evidence(Data Reports) of being UT examined. See A.A.R.#7.
15. Two of the 20 valves physically checked had serial numbers that did not match the Data Report serial numbers. See A.A.R.#8.

- C. The Atomic Energy Commission letter of 6-20-72, page 3, paragraph 6 (see attached U.I.A. #34, Quality Audit Checklist, page 3) states: "In certain instances, you may wish to repair valves found to have wall thickness below the specified minimum. In such instances, you are requested to provide to this office for our review the proposed repair procedure, including a description of techniques to be used to verify the acceptability of the repaired components".

There is no documented evidence in the ESD 236 Documentation Packages that M.W. Kellogg (Pullman Power Products) or PG&E complied with this A.E.C. requirement.

1. There are 47 Data Reports that indicate that valves were below minimum wall requirement. U.I.A. #34, A.A.R. #8 (see attached) identified two valves (Locations # 2-PCV-455A and # 2-PCV-455B) that were weld repaired to meet minimum wall requirements. But the ESD 236 Documentation Packages do not specify which of the valves were weld repaired. It is an item of concern, that the NRC should investigate, as to which valves were weld repaired or replaced.
2. The ESD 236 Documentation Packages do not provide any information as to the weld procedure used to weld repair valves in Locations #2-PCV-455A and # 2-PCV-455B and any other valves that might have been weld repaired. There is no documentation available that assures that the A.E.C reviewed and approved the weld procedures used or the description of techniques used to verify the acceptability of the repaired valves. The NRC should determine what valves were weld repaired; if the weld procedure used was acceptable; and if the technique used to verify acceptability was adequate.

There is no assurance in the ESD 236 Documentation Packages that valves weld repaired meet the A.E.C. requirements.

- D. In reviewing the A.E.C. Letter of 6-20-72 and the Westinghouse Letter # PG&E 2080 of 7-25-72, a question is raised as to what is the relevant code and/or standard the "Reactor Coolant Pressure Boundary Valves" should conform to in relation to "specified minimum wall thickness"?

Page 2, paragraph 4, of the A.E.C. Letter (see attached U.I.A. # 34, Quality Audit Checklist, page 2) states: "Specified Minimum Wall Thickness", as used above, means the wall thickness required by the relevant codes and standards (e.g. ASA B31.1 (1955); USAS B31.1.0 (1967);

USAS B16.5; MSS-SP-66) in effect on the date of the purchase order".

Page 1 of the Westinghouse Letter (see attached U.I.A. #34, Quality Audit Checklist, page 5) states: "Note that the pressurizer safety valves for Diablo Canyon Units 1 and 2 were designed to meet the requirements of Article 9 of the ASME Boiler and Pressure Vessel Code, Section III (1968 Edition). The valves were not designed to meet the minimum wall thickness requirements of ANSI B16.5".

The Westinghouse supplied reactor coolant pressure boundary valves (pressurizer safety valves) were designed to meet the requirements of Article 9 of the ASME Boiler and Pressure Vessel Code, Section III (1968 Edition). This code is not referenced in the A.E.C. Letter which specifies relevant codes and standards. Westinghouse states the valves were not designed to meet the minimum wall thickness requirements of ANSI B16.5 (USAS B16.5) which is referenced in the A.E.C. Letter as one of the relevant codes. This raises the question of whether the Diablo Canyon reactor coolant pressure boundary valves (pressurizer safety valves) meet the A.E.C. (NRC) code requirements. The NRC should investigate this issue to assure that the Diablo Canyon reactor coolant pressure boundary valves (pressurizer safety valves) comply with the relevant codes and standards as established by the A.E.C. (NRC) for valves within the reactor coolant pressure boundary, as defined in subsection 50.55 (a) (codes and standards) of 10CFR 50.

The Westinghouse supplied "pressurizer safety valves" (reactor coolant pressure boundary valves) do not comply with PG&E C.S. #8711 Section 2.2.1 Code requirement to be designed, manufactured, and fabricated to ANS B31.1.

PG&E C.S. #8711.2.2.1 states "The reactor coolant piping and pressurizer surge lines of the reactor coolant systems have been designed, manufactured, and fabricated to ANS B31.1 with applicable Nuclear Code Cases and will be furnished by Westinghouse". C.S. #8711 Section 2.1 and 2.16 states reactor coolant system except for main coolant loops and pressurizer surge line are to be designed, fabricated, and erected per ASME Boiler Code Section I.

The Westinghouse supplied "pressurizer safety valves" (reactor coolant pressure boundary valves) as referenced in the Westinghouse Letter #PG&E 2080 do not comply with the PG&E Code Requirement to be designed, manufactured, and fabricated to ANS B31.1. This is a nonconformance

to PG&E C.S. #8711 Section 2.2.1. The Westinghouse supplied valves were designed to meet Article 9 of ASME Boiler and Pressure Vessel Code, Section III (1968 Edition).

Note: PG&E C.S. #8711 Section 1.1.1 defines piping to include valves, hangers and supports. Valves are considered part of the piping system.

The apparent nonconformance of Westinghouse supplied "pressurizer safety valves" (reactor coolant pressure boundary valves) to PG&E C.S. #8711 Code Requirements indicates noncompliances to 10CFR50 Appendix B Section III Design Control, Section IV Procurement Document Control, Section VII Control of Purchased Material, Equipment or Services, and Section XV Nonconforming materials, Parts or Components.

The Nuclear Regulatory Commission should investigate this nonconformance of Westinghouse supplied valves to PG&E Code Requirements for the reactor coolant piping and pressurizer surge lines of the reactor coolant systems to assure that the properly designed, manufactured and fabricated valves have been installed at the Diablo Canyon Nuclear Plant and that the appropriate 10CFR50 Appendix B requirements have been complied with.

This report, Pullman Power Products' Unscheduled Internal Audit #34, and Internal Audit #101 have identified significant Quality Assurance Program Deficiencies in the PG&E/M.W. Kellogg (Pullman Power Products) Quality Assurance Records for the ultrasonic thickness measurement of Unit #1 and #2 Reactor Coolant Pressure Boundary Valves as requested by the Atomic Energy Commission. 10CFR50 Appendix B XVII specifies that "sufficient records shall be maintained to furnish evidence of activities affecting quality". This requirement has not been implemented. In addition, a question has been raised as to what code or standard the Reactor Coolant Pressure Boundary Valves (pressurizer safety valves) should be designed, manufactured, and fabricated to. The Nuclear Regulatory Commission should investigate the identified deficiencies to determine if the use of these valves which are important to nuclear safety will effect the safe operation of the Diablo Canyon Nuclear Plant.

Sincerely,

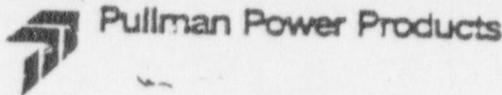
Harold Hudson
Phone 805-528-5970

LIST OF ATTACHMENTS

1. Pullman Power Products' Unscheduled Internal Audit #34 - ESD 236 Quality Assurance Records.
 - A. Quality Audit Summary Report.
 - B. Audit Action Request (A.A.R.) Nos. 1 thru 8.
 - C. U.I.A. #34 Attachments Nos. 1 thru 10.
 - D. Quality Audit Checklist (Program Requirements and Observations).

2. Pullman Power Products' Internal Audit #101 - Organization.
 - A. Quality Audit Summary Report.
 - B. Audit Action Request (A.A.R.) No. 1.
 - C. Quality Audit Checklist (Program Requirements and Observations).
 - D. I.A. #101 Attachemnts.
 1. Interoffice Correspondence of July 28, 1982 and attachments.
 2. Interoffice Correspondence of September 15, 1982.

3. PG&E Contract Specification #8711.
 - A. Section 1.1.1 - Outline of Work.
 - B. Section 2.2.1 and 2.16 - Description of Work.



**ADVANCE COPY
 AUDIT REPORT**

QUALITY AUDIT SUMMARY REPORT

IT NO.: Unscheduled #34

FILE NO.: XVII

AUDIT DATE 11-18-80

ACTIVITY AUDITED

QUALITY ASSURANCE RECORDS

APPLICABLE DOCUMENTS 10CFR503 XVII
 A.E.C. Letter 6-20-72, PG&E DR#103-R1, ESD236
 Westinghouse Letter #PG&E2080

PURPOSE OF AUDIT

Unscheduled

P. Dawson, current supervisor but not supervisor at time QA Records initiated.

DISTRIBUTION

TITLE	NAME
VICE PRESIDENT QA	E.F. GERWIN
DIRECTOR OF QA	A.A. ECK
RESIDENT CONSTR. MGR.	J.W. RYAN
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A.N.I.	R. SANDERSON
FIELD QA/QC MANAGER	H. KARNER
V.P. MECH. CONSTR.	P.L. EVANS
PG&E	J. ARNOLD
FILE	

CODE A.A.R. #

SUMMARY

ESD 236 QUALITY ASSURANCE RECORDS

ESD 236, Ultrasonic Thickness Measurement of Boundary Valves, was identified on Internal Audit #101 as not having a Procedure Qualification Record. It was determined that ESD 236 was not a nondestructive testing procedure and did not require a P.Q.R. Subsequent investigation revealed that measurement of the Boundary Valves was performed to assure minimum wall thickness as required by the U.S. Atomic Energy Commission in their letter of 6-20-72 for "valves important to nuclear safety". PG&E initiated Discrepancy Report #103-R1 which stated that the individual valves to be measured would be as shown on Westinghouse letter #PG&E 2080. The valves identified in the Westinghouse letter are called out as "Class I valves which make up the reactor coolant pressure boundary" and are part of piping systems designated by PG&E as Seismic Class I. M.W. Kellogg (Pullman) initiated ESD 236, which was approved by PG&E, to implement the valve body wall thickness measurement by an ultrasonic method as required by the A.E.C.

Unschedule Internal Audit #34 has identified major Program Deficiencies in the Quality Assurance Records (Valve Wall Thickness Data Reports) for the UT thickness measurement of boundary valves. The Program Deficiencies are that traceability of the thickness readings obtained and calibration of test equipment cannot be assured.

There is no documented evidence of "procedure verification tests" to determine that transducers used in the inspections were of a suitable frequency, size, and adapted with shoes, wedges, or saddles as each valve measurement requires. None of the Data Reports list the size of transducers, shape of transducers and type designation.

RESPONSIBLE CONTACT: H. Karner
 TITLE: QA/QC Manager

PREPARED BY: H. Hudson
 TITLE: Internal Auditor

DATE: 11-11-80

QUALITY AUDIT SUMMARY REPORT

AUDIT NO.: Unscheduled #34

FILE NO.: XVII

AUDIT DATE: 11-18-82

CODE	A.A.R. #	SUMMARY
1	1	Six Data Reports do not list a transducer serial number. Nineteen Data Reports do not list the testing frequency or nominal frequency of the transducers used to make the inspections. Three Data Reports do not list the type couplant used.
1	2	Seven Data Reports do not list a serial number for the UT thickness tester used to make the measurements. Nineteen Data Reports list two different UT thickness testers as the equipment used to make the valve measurements but there is only one set of calibration information and valve body measurements results. Two hundred and seven Data Reports reference serial numbers for UT thickness tester equipment that could not be traced to documentation for certification of equipment calibration. There are conflicting procedure requirements as to the type of UT thickness test equipment to be used, digital read out or cathode ray tube.
1	2	
1	2	
1	2	
1	3	Fourteen Data Reports do not list a serial number for the micrometers used to check the calibration accuracy on the valves by a mechanical means. Eighty four Data Reports reference serial numbers for micrometers that could not be traced to documentation for certification of equipment calibration.
1	3	
1	4	Calibration linearity was established by taking multiple readings on a step wedge block. Calibration thickness was established by measuring the step wedge block by UT.
1	4	
1	4	Six Data Reports do not list any information concerning the step wedge blocks used for calibrating the UT test equipment. Nine Data Reports do not give complete information concerning the type of stainless steel the step wedge blocks were made of. Eleven Data Reports do not list pre or post operation calibration information.
1	4	
1	5	One Data Report had a calibration check against the step wedge material that was not accurate within 2%. Three Data Reports had a calibration check on the valve by a mechanical means that was not accurate within 2%. These valves were accepted.
1	5	
1	6	Three Data Reports do not record the lowest reading obtained by the measurement in the proper space. Forty two Data Reports indicate the valves as below the minimum allowed wall thickness but the Data Report forms are signed in the space that indicates the valves were physically

RESPONSIBLE CONTACT: H. Karner
E: QA/OC Manager

PREPARED BY: H. Hudson
TITLE: Internal Auditor DATE: 1-11-83

QUALITY AUDIT SUMMARY REPORT

AUDIT NO.: Unscheduled #34 FILE NO.: XVII AUDIT DATE: 11-18-82

CODE	A.A.R. #	SUMMARY
2	6	<p>marked as acceptable. Seven Data Reports indicate valves had acceptable wall thickness but the Data Report forms are not signed in the space that indicates valves were physically marked as accepted. Many Data Reports were found to have original information whited out and new information inserted.</p>
1	7	<p>Twelve M.W. Kellogg (Pullman) Discrepancy Reports were identified as being generated to report to PG&E valves found to be below minimum wall requirement. Three Discrepancy Reports do not have a signature and date for a Final Disposition indicating work completed. Thirteen Data Reports with valves below minimum wall could not be identified as being reported to PG&E on a Discrepancy Report. Eleven Data Reports did not have a complete measurement inspection of all areas of the valves as required by procedure. Fourteen valve locations, listed by Westinghouse to be examined, had no documented evidence of being UT examined.</p>
1	7	<p>Eighteen audited valves were properly marked. Two audited valves had serial numbers that did not match the Data Report serial numbers. Several valves and relating piping had arc strikes and one pipe had a gouge.</p>
1	7	<p>The individuals performing UT measurements were certified per ASNT-TC-1A, Supplement C.</p>
1	7	<p>Two hundred fifty four Valve Wall Thickness Data Reports were audited (approximately 124 Unit #1 and 130 Unit #2 reports). Some valves identified on the reports as being for one unit were actually installed in the other unit. Twenty valves installed in the field were physically examined.</p>

RESPONSIBLE CONTACT: H. Karner E: OA/CC Manager	PREPARED BY: H. Hudson TITLE: Internal Auditor DATE: 1-21-83
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AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	UNSCHEDULED AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>1</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 OA Records</u>		
AUDIT DATE:	<u>11-18-82</u>				
REFERENCE DOCUMENTS:	<u>PG&E DR103-R1, A.E.C. Letter 6-20-72, ESD 236</u>				

FINDING: TESTING EQUIPMENT - TRANSDUCERS

1. There is no documented evidence of "procedure verification tests" to determine that transducers used in the Boundary Valve UT inspections were of a suitable frequency, size and adapted with shoes, wedges, or saddles as each valve measurement requires. This is a nonconformance to ESD 236.6.7.

--Continued on page 2--

FINDING BY: H.Hudson DATE: 1-5-83 ACK'D BY: [Signature] DATE: 1-21-83

SUSPECTED CAUSE:

1 and 2 - Unknown

3,4, and 5 - Omission by UT technician performing measurement.

RECOMMENDED CORRECTIVE ACTION:

1. If no evidence can be provided of "procedure verification tests" for transducer information then valve measurements be rejected and remeasured per procedure requirements.

--Continued on page 2--

DUE DATE:

CORRECTIVE ACTION TAKEN:

TAKEN BY: APPROVED BY:

STEPS TO PREVENT RECURRENCE:

TAKEN BY: APPROVED BY:

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION:

IF NO - PLEASE EXPLAIN: YES NO

BY: DATE:

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

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AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	UNSCHEDULED AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>1</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 QA Records</u>		
AUDIT DATE:	<u>11-18-82</u>				
REFERENCE DOCUMENTS:	<u>PG&E DR103-R1, A.E.C. Letter 6-20-72, ESD 236</u>				

FINDING: CONTINUED:

- None of the Valve Wall Thickness Data Reports list the size of transducer, shape of transducer and type designation (manufacturer's designation or description). This is a nonconformance to ASTM E114-63.6.1.2, and ESD 236.3.2 and 5.1.
- There are six Data Reports that do not list a transducer serial number. This is a nonconformance to ESD 236.4.1 and 8.3. See attachment #1 for list of Data Reports.
- There are nineteen Data Reports which do not list the testing frequency or nominal frequency of the transducers used to make the inspections. This is a nonconformance to ASTM E114-63.6.1.1 and 6.1.2.3, ESD 236.3.2, 5.1, 4.1 and 8.3. See attachment #1 for a list of Data Reports.
- Three Data Reports do not list the type couplant used to make the inspections. This is a nonconformance to ASTM E114-63.6.1.3, ESD 236.6.3, 4.1, 8.3, 3.2 and 5.1. See attachment #1 for list of Data Reports.

RECOMMENDED CORRECTIVE ACTION CONTINUED:

- NDE Supervisor research and provide information concerning size, shape and type transducers used to make measurements. If information cannot be provided, valve measurements be rejected and remeasured per procedure requirements.
- Reject valve measurements and remeasure recording transducer serial number.
- 4 and 5. NDE Supervisory research and provide required information. If information cannot be provided, valve measurements be rejected and remeasured per procedure requirements.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 IF NO - PLEASE EXPLAIN: YES NO

DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

AUDIT ACTION REQUEST

FILE NO.: XVII UNSCHEDULED
AUDIT NO.: 34 A.A.R. NO.: 2

OBSERVATION CODE: 1 ACTIVITY AUDITED: ESD 236 QA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: PG&E DR103-R1, A.E.C. Letter 6-20-72, ESD 236, ASTM E114

FINDING: TESTING EQUIPMENT - ULTRASONIC THICKNESS TESTERS

1. Seven Valve Wall Thickness Data Reports do not list a serial number of the UT thick-
ness tester equipment used to make the measurements. Traceability of the thickness
readings obtained cannot be assured. See atachment #1 for a list of Data Reports.
--Continued on page 2 and 3--

FINDING BY: H. Hudson DATE: 1-6-83 ACK'D BY: ASD DATE: 12-23-82

SUSPECTED CAUSE:

1. Omission by UT technicians performing measurements.
2. Data Report forms were preprinted with both types of equipment listed. The UT
Technician did not indicate the actual equipment used.
--Continued on page 4--

RECOMMENDED CORRECTIVE ACTION:

1. Measurements for Finding #1 valves be rejected and valves remeasured.
2. Measurements for Finding #2 valves be rejected and valves remeasured.
3. NDE Supervisor provide calibration records for Finding #3 valves or valve measurements
be rejected and valves remeasured.
--Continued on page 4--

DUE DATE:

CORRECTIVE ACTION TAKEN:

TAKEN BY: _____ APPROVED BY: _____

STEPS TO PREVENT RECURRENCE:

TAKEN BY: _____ APPROVED BY: _____

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION:
IF NO - PLEASE EXPLAIN: YES NO

BY: _____ DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

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AUDIT ACTION REQUEST

FILE NO.: XVII UNSCHEDULED
AUDIT NO.: 34 A.A.R. NO.: 2

OBSERVATION CODE: 1 ACTIVITY AUDITED: ESD 236 QA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: PG&E DR103-R1, A.E.C. Letter 6-20-72, ESD 236, ASTM E114

FINDING: CONTINUED:

- Nineteen Data Reports list both the Nortec NDT-120, SN#12224, and the Branson Sonoray Model 303B, SN#18060, as the ultrasonic thickness tester equipment used to make the valve measurements. But there is only one set of calibration information and valve body measurement results for each Data Report. The actual UT equipment used to make the valve measurements cannot be determined for the purpose of traceability. See attachment #2 for a list of Data Reports.
- Two hundred and seven Data Reports reference UT thickness test equipment that have serial numbers that could not be traced to M.W. Kellogg (Pullman), PG&E General Construction or manufacturer's documentation for certification of equipment calibration. There are seven UT thickness testers with different serial numbers referenced on the various reports. The UT testers referenced but not traceable are:

- | | | | |
|----|-----------------|-----|------------|
| A. | Branson Sonoray | 301 | SN#710247 |
| B. | Branson Sonoray | 301 | SN#7012417 |
| C. | Branson Sonoray | 301 | SN#701247 |
| D. | Branson | 301 | SN#7012717 |
| E. | Branson Sonoray | 301 | SN#7102417 |
| F. | Branson | 303 | SN#186060 |
| G. | Branson | 303 | SN#18060 |

See attachments #3, #4, and #5 for a list of Data Reports.

The above listed discrepancies are nonconformances to ESD 236.4.1, 4.2, and 8.3.

- There are conflicting requirements as to the type of UT thickness test equipment to be used to make the measurements. ESD 236.1 specifically references digital read out equipment but there are also references to an ASTM procedure that requires use of cathode ray tube equipment.
- ESD 236.1 under Scope states that "this procedure is based on pulse echo digital read out equipment as specified in PG&E report 103-R1". There are no references in the related PG&E documentation that requires the use of digital read out equipment.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION

IF NO - PLEASE EXPLAIN: YES NO

DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____



AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	UNSCHEDULED AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>2</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 QA Records</u>		
AUDIT DATE:	<u>11-18-82</u>				
REFERENCE DOCUMENTS:	<u>PG&E DR103-R1, A.E.C. Letter 6-20-72, ESD 236, ASTM E114</u>				

FINDING: CONTINUED:

This is an item of concern requiring supervisory attention.

- ASTM E114-63.2.3.2, referenced in ESD 236.3.2 and 5.1, states that "thickness may be determined from one side by observing the spacing of the multiple reflections or reverberations on the cathode ray tube over a given distance on the screen". ESD 236 which is based on digital read out equipment per the Scope of the procedure does not meet the requirement of ASTM E114-63.2.3.2 to use cathode ray tube equipment. The use of digital read out equipment as referenced in ESD 236.1 is a nonconformance to ESD 236.3.2 and 5.1 and ASTM E114-63.2.3.2.

- An M.W. Kellogg Interoffice Correspondence, attachment #6A, states "The PG&E furnished Branson 303B is missing the digital module". No subsequent documentation has been found indicating that the referenced Branson 303B was later adapted with a digital module. Since no calibration or other records have been located for the seven Branson models including the 303B models referenced in Finding #3 it is unknown if these testers were digital read out or cathode ray tube. This is an item of concern requiring supervisory attention.

- A Branson Mark I, SN#742101, with traceable calibration records is a cathode ray tube instrument and was used to make valve measurements. The use of this UT tester is a nonconformance to ESD 236.1 but does comply with ASTM E114-63.2.3.2. This is an item of concern requiring supervisory attention.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 IF NO - PLEASE EXPLAIN: YES NO

DATE: _____
 A.A.R. CLOSED BY: _____ DATE: _____
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AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	UNSCHEDULED AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>2</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 OA Records</u>		
AUDIT DATE:	<u>11-18-82</u>				
REFERENCE DOCUMENTS:	<u>PG&E DR103-R1, A.E. Cletter 6-20-72, ESD 236</u>				

SUSPECTED CAUSE CONTINUED:

- Possible error by UT technician in recording actual serial numbers and/or inadequate documentation control for UT equipment calibration information.
- Unknown

RECOMMENDED CORRECTIVE ACTION CONTINUED:

- Per ESD 263.8.1 the NDE Supervisor shall determine and initiate corrective action subject to the QA Managers approval.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 IF NO - PLEASE EXPLAIN: YES NO

DATE: _____
 A.A.R. CLOSED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____

AUDIT ACTION REQUEST

FILE NO.: XVII UNSCHEDULED
 AUDIT NO.: 34 A.A.R. NO.: 3

OBSERVATION CODE: 1 ACTIVITY AUDITED: ESD 236 OA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: PG&E DR103-R1, A.E.C. letter 6-20-72, ESD 236

FINDING: TESTING EQUIPMENT - MICROMETERS

1. Fourteen Valve Wall Thickness Data Reports do not list a serial number for the micrometers used to check the calibration accuracy on the valves by a mechanical means. Traceability of thickness readings obtained cannot be assured. See Attachment 2 for a list of Data Reports.

FINDING BY: H. Hudson DATE: 1-6-83 CHECKED BY: *ASD* DATE: *2-23-83*

SUSPECTED CAUSE:

- Omission by UT technicians performing measurements.
- Possible error by UT technicians in recording actual serial numbers and/or inadequate documentation control for micrometer calibration information.

RECOMMENDED CORRECTIVE ACTION:

- Measurements for Finding #1 valves be rejected and valves remeasures.
- NDE Supervisor provide calibration records for listed micrometers or valve measurements be rejected and valves remeasured.

SEE DATE:

CORRECTIVE ACTION TAKEN:

TAKEN BY:

APPROVED BY:

STEPS TO PREVENT RECURRENCE:

TAKEN BY:

APPROVED BY:

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION:
IF NO - PLEASE EXPLAIN:

YES

BY:

DATE:

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

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AUDIT ACTION REQUEST

FILE NO.: XVII UNSCHEDULED
AUDIT NO.: 34 A.A.R. NO.: 3

OBSERVATION CODE: 1 ACTIVITY AUDITED: ESD 236, OA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: PG&E DR 103-R1, A.E.C. letter 6-20-72, ESD 236

FINDING:

2. Eighty-four Data Reports reference micrometers that have serial numbers that could not be traced to M. W. Kellogg (Pullman), PG&E General Construction, or manufacturer's documentation for certification of equipment calibration. There are seven micrometers with different serial numbers referenced on the various Data Reports. The micrometers referenced but not traceable are:

- a) #22508 MWK
- b) #01
- c) #1-2
- d) #1
- e) #2109286
- f) #210928C
- g) #2250 MWK

See Attachment 6 for a list of Data Reports.

The above listed discrepancies are nonconformances to ESD 236, Paragraphs 4.1, 4.2, 6.5, and 8.3.

~~FOLLOW UP~~ ~~ACTIVITY COMPLETION~~ ~~APPROVED~~ ~~CORRECTIVE ACTION~~
 IF NO -- PLEASE EXPLAIN: YES ~~XXXXXXXXXX~~ NO

DATE:

A.A.R. CLOSED BY: _____

DATE: _____

APPROVED BY: _____

DATE: _____

AUDIT ACTION REQUEST

FILE NO.: XVII ^{Unscheduled} AUDIT NO.: 34 A.A.R. NO.: 4

OBSERVATION CODE: 1 ACTIVITY AUDITED: ESD 236 QA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: ESD 236, PG&E DR 103-R1

~~IDENTIFY~~ SUSPECTED CAUSE: (cont.)

3. Failure by the UT technicians performing measurements to record information and/or calibration operations were not performed.

RECOMMENDED CORRECTIVE ACTION: (cont)

- 3. A. Reject valve and remeasure.
- B. NDE Supervisor review Data Report and evaluate data and accept or reject valve.
- C. Reject valves and remeasure
- D. Reject valve and remeasure.
- E. Reject valves and remeasure.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
IF NO - PLEASE EXPLAIN: YES NO

DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

DATE: _____

AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	Unscheduled	AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>5</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 QA Records</u>			
AUDIT DATE:	<u>11-18-82</u>					
REFERENCE DOCUMENTS:	<u>ESD 236, A.E.C. Letter (6-20-72)</u>					

FINDING: Calibration Checks not accurate within 2%

1. Data Report, location #1-8067-C, has a pre calibration check that list the step wedge material actual step thickness for reading #C as .497. The pre operation calibration UT reading for #C was .500. The post operation calibration actual (cont.)

FINDING BY: H. Hudson DATE: 1-7-83 ACH'D BY: ASD DATE: 2-25-83

SUSPECTED CAUSE:

1. and 3. Unknown
2. Possible error by UT technician in recording information.

RECOMMENDED CORRECTIVE ACTION:

1. Reject finding #1, 2. and 3 valve measurements and remeasure.

DUE DATE:

CORRECTIVE ACTION TAKEN:

TAKEN BY:

APPROVED BY:

STEPS TO PREVENT RECURRENCE:

TAKEN BY:

APPROVED BY:

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION:
IF NO - PLEASE EXPLAIN:

YES NO

BY: _____ DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____



AUDIT ACTION REQUEST

FILE NO.:	<u>XVII</u>	Unscheduled AUDIT NO.:	<u>34</u>	A.A.R. NO.:	<u>5</u>
OBSERVATION CODE:	<u>1</u>	ACTIVITY AUDITED:	<u>ESD 236 QA Records</u>		
AUDIT DATE:	<u>11-18-82</u>				
REFERENCE DOCUMENTS:	<u>ESD 236, A.E.C. Letter (6-20-72)</u>				

FINDING: (continue)

1. (cont) step thickness for reading #C was .497, but the post operation calibration UT reading for #C was .45. The accuracy between the pre and post UT reading for #C is 10% off. The valve was accepted with a minimum wall allowed as .437 and the actual lowest valve body measurement at .510. This is a nonconformance to ESD 236.7.2.2 and A.E.C. letter (6-20-72) item #2.
2. Data Report, location #1-8956-C (11-29-73 replacement), has a pre operation calibration check by a mechanical means that is 1.062 and the UT reading is 1.050. The post operation calibration check on the valve by a mechanical means was 1.062, but the UT reading was 2.050. The accuracy between the pre and post UT check is approximately 48% off. The valve was accepted with a minimum wall allowed as 1.310 and the actual lowest valve body measurement at 1.475. This is a nonconformance to ESD 236.7.2.3 and the A.E.C. letter (6-20-72) item #2.
3. Data Reports, location #2-PCV-455B (2-25-76, SN 26N86) and location #2-PCV-455A (2-25-76, SN46W210) have pre and post operation calibration checks by a mechanical means that read .760. The pre and post UT reading were .780. The accuracy between the mechanical and UT readings is approximately 2.6% off. The valves were accepted with a minimum wall allowed as .750 and the actual lowest valve body measurement as .750. This is a nonconformance to ESD 236.7.2.3 and A.E.C. Letter (6-20-72) item #2.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 YES NO
 ? NO - PLEASE EXPLAIN:

DATE: _____
 A.A.R. CLOSED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____



AUDIT ACTION REQUEST

1.

FILE NO.:	XVII	Unscheduled AUDIT NO.:	34	A.A.R. NO.:	7
OBSERVATION CODE:	1	ACTIVITY AUDITED:	ESD 236 QA Records		
AUDIT DATE:	11-18-82				
REFERENCE DOCUMENTS:	ESD 236, PG&E DR 103-R1, KFP 10, Westinghouse Letter #PG&E 2080				

FINDING: Incomplete Information

1. Three Discrepancy Reports (DR #1168, DR #960, DR #959), generated to report to PG&E valves found to be below minimum wall requirements, do not have a signature and date for a Final Disposition indicating work completed. A total of ten valves are listed on the three Discrepancy Reports. (continue on pg 2)

FINDING BY: H. Hudson DATE: 1-10-83 CHECKED BY: ASD DATE: 2-2-83

SUSPECTED CAUSE:
1, 2, and 3. Unknown

4. M.W. Kellogg documentation indicates these valves deleted but there is no explanation for the deletion. Locations #2-8010-A,B,C valves (cont on pg3)

RECOMMENDED CORRECTIVE ACTION:

1. NDE Supervisor review DR's and determine if valves have been dispositioned per the DR requirements. If so close out the DR's.

2. NDE Supervisor research the listed 13 Data Report valves to determine if identified on DR's to PG&E and if no evidence of being reported on a DR, (continue on pg3)

CORRECTIVE ACTION TAKEN:

TAKEN BY: _____ APPROVED BY: _____

STEPS TO PREVENT RECURRENCE:

TAKEN BY: _____ APPROVED BY: _____

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
IF NO - PLEASE EXPLAIN: YES

BY: _____ DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

AUDIT ACTION REQUEST

FILE NO.: XVII ^{Unscheduled}
 AUDIT NO.: 34 A.A.R. NO.: 8

OBSERVATION CODE: 1 and 2 ACTIVITY AUDITED: ESD 236 QA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: ESD 236

FINDING: Valves with Physical Defeciciencies

1. A. Location #2-PCV-455B valve has a serial number "H.T.N86 S-N26" marked on the valve. This serial number does not match the serial number listed on the Data Report (2-25-76). The Data Report serial number is "26N86". (cont on pg 2)

FINDING BY: H. Hudson DATE: 1-10-83 ACK'D BY: ASD DATE: 2-25-83

SUSPECTED CAUSE:

1. A and B-Each of these valves has been examined four times. There is documented evidence with DR 2351 that the valves were repaired once and there are indications on the latest Data Reports (2-25-76) that they were repaired a second time.

(Continue on pg 2)

RECOMMENDED CORRECTIVE ACTION:

1. A. Accept valve if NDE Supervisor can provide traceability of valve serial number to Data Report through various repair operations (DR's, shipping documents and Data Reports.) If not traceable reject and remeasure.
1. B. Reject and remeasure. (Continue on pg 3)

DUE DATE:

CORRECTIVE ACTION TAKEN:

TAKEN BY: _____ APPROVED BY: _____

STEPS TO PREVENT RECURRENCE:

TAKEN BY: _____ APPROVED BY: _____

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION:
 IF NO - PLEASE EXPLAIN: _____ YES _____ NO _____

BY: _____ DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

AUDIT ACTION REQUEST

FILE NO.: XVII ^{Unscheduled}
 AUDIT NO.: 34 A.A.R. NO.: 8

OBSERVATION CODE: 1 and 2 ACTIVITY AUDITED: ESD 236 QA Records

AUDIT DATE: 11-18-82

REFERENCE DOCUMENTS: ESD 236

FINDING: (Continue)

1. B. Location #2-PCV-455A valve has the following numbers marked on the valve: HT 361, SN 16, N-95001, 13088. These serial numbers do not match the serial number listed on the Data Report (2-25-76). The Data Report serial number is "46W210".
 Valve numbers not matching the Data Report serial number are a nonconformance to ESD 236.7.3.5, 7.3.6, and 4.1.
 2. A. Valve location #2-8956-D has an arc strike on the bonnet flange and below the Darling ID tag.
 B. Valve location #28948-D has an arc strike on the valve on the west side near weld #WIB 293. In addition there is an arc strike on the 10" SS pipe approximately 8" southwest of weld #WIB293. There is also a gouge in the 10" SS pipe, 3/8" x 1/8" x approximately 1/32" deep, 15" west of weld #WIB293. These findings were identified to QC Inspector Ken Guy.
 C. Valve location #2-8702 has an arc strike on the valve near the ID tag.
 D. Location #1-8956-A, valve bonnet flange has two bolts that are not fully engaged with the nuts. Bolt #16 is approximately 2 nut threads below the face of the nut and Bolt #10 is approximately 1 nut thread below the face of nut.
- The above findings are items of concern requiring supervisory attention.

SUSPECTED CAUSES: (Continue)

1. (Cont) Also there are inconsistencies between Data Reports concerning serial numbers referenced. Possible multiple handling and repair of valves has created confused serial numbers on valves.
2. Unknown

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 IF NO - PLEASE EXPLAIN: YES NO

DATE: _____

A.A.R. CLOSED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

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AUDIT ACTION REQUEST

FILE NO.: XVII ^{Unscheduled} AUDIT NO.: 34 A.A.R. NO.: 8

SERVATION CODE: 1 and 2 ACTIVITY AUDITED: ESD 236 QA Records

DATE: 11-18-82

REFERENCE DOCUMENTS: ESD 236

INDINGS

RECOMMENDED DISPOSITION: (Continue)

- Arc strikes and gouge be evaluated by QC and appropriate action taken.

FOLLOW UP: ACTIVITY COMPLIES WITH APPROVED CORRECTIVE ACTION
 YES NO

DATE: _____
 A.A.R. CLOSED BY: _____ DATE: _____
 APPROVED BY: _____ DATE: _____

ATTACHMENT #1 - DATA REPORTS

No Transducer S/N Listed

1. 1-8145
2. 2-8088D
3. 2-8033C
4. 2-8088C
5. 1-8067D(7-31-73)

No Couplant Listed

1. 2-PCV-455A
2. 2-PCV-455B (#96186)
3. 2-8000-C

No UT Equipment S/N Listed

1. 1-8075-C
2. 1-PCV-456
3. Valve #0566 (No loc #)
4. Valve #0992 (No loc #)
5. 2-8073-B
6. 2-8033-D
7. 2-8057-B

No Frequency Listed

1. 1-8067A (5-9-74)
2. 1-8956D (11-29-73)
3. 1-PCV-474
4. 2-8378-C (8-8-73)
5. 1-8089-C
6. 1-8089-D
7. 1-8818-B
8. 1-8033-C
9. 1-8740-A
10. 1-8948-C
11. 2-PCV-455A (12-12-75)
12. 2-8073D (1-21-75)
13. 2-8819-B
14. 2-8088-C
15. 2-8058-A
16. 2-8089-B
17. 2-8075-B
18. 2-8956-B
19. 2-8073-B

ATTACHMENT #2 - DATA REPORTS

No Micrometer S/N Listed

1. 1-PCV-456
2. 1-8073-C
3. 1-8956-D (original)
4. 1-8820
5. 1-8948-D
6. 1-8956-C
7. 1-8033-B
8. 2-PCV-455A (2-25-76)
9. 2-PCV-455B (2-25-76)
10. 2-8379-B
11. 2-8378-C
12. 2-8000-C
13. 2-LCV-459 (Revised)
14. 2-8088-C

Branson/Nortec 303/NDT 120
S/N 18060/12224 Listed on Reports

1. 1-8372-B (6-5-73) replacement
2. 1-8372-C (6-5-73) replacement
3. 1-8819-B
4. 1-8819-D
5. 1-8819-C
6. 1-8819-A
7. 1-8867-D
8. 1-8905-B
9. 1-8377
10. 1-8372-A
11. 1-8905-A
12. 1-8367-B
13. 1-8372-B (5-17-73)
14. 1-8367-A
15. 1-8905-C
16. 1-8905-D
17. 1-8372-C (5-18-73)
18. 1-8372-D
19. 1-8367-C

ATTACHMENT #3 - DATA REPORTS WITH UT EQUIPMENT S/N NOT TRACEABLE

#742101 - PPP equipment - traceable

186060

1. 1-8075-A
2. 1-8075-B
3. 1-8075-D
4. 1-8088-A
5. 1-8088-B
6. 1-8088-C
7. 1-8088-D
8. 1-8076
9. 1-8900-A
10. 1-8900-B
11. 1-8900-C
12. 1-8900-D
13. 1-8810-A
14. 1-8810-B
15. 1-8810-C
16. 1-8810-D
17. 1-8000-A
18. 1-8000-B
19. 1-8000-C
20. 1-8074-B
21. 1-8074-C
22. 1-8074-D
23. 1-PCV-455C
24. 1-PCV-474
25. 1-LCV-459
26. 1-PCV-455A
27. 1-PCV-455B
28. 2-8378C (Orig in UNIT #1 book)
29. 1-8057-C
30. 1-8057-A
31. 1-8058-A
32. 1-8058-B
33. 1-8058-C
34. 1-8058-D
35. 1-8089-A
36. 1-8089-B
37. 1-8089-C
38. 1-8089-D
39. 1-8057-B
40. 1-8057-D
41. 1-8063-A
42. 1-8063-B
43. 1-8063-C
44. 1-8063-D
45. 1-8067-A
46. 1-8067-B
47. 1-8067-C
48. 1-8067-D
49. 1-8949-D
50. 1-8074-A
51. 1-8073-A
52. 1-8073-B
53. 1-8073-C
54. 1-8073-D
55. 1-8378-C
56. 1-8949-A
57. 1-8949-B
58. 1-8949-C
59. 2-8378-B
60. 2-8379-A
61. 1-8145
62. 1-LCV-460
63. 1-8379-B (Original)
64. 1-8379-A
65. 1-8379-B
66. 1-8378-A
67. 2-8378-A
68. #0604
69. #0708
70. #0833
71. 1-8956-A
72. 1-8956-B
73. 1-8956-C
74. 1-8956-D
75. 1-8378-B
76. 2-8820
77. 1-8820
78. 1-8948-D
79. 1-8740-D
80. 1-8818-A
81. 1-8818-B
82. 1-8818-C
83. 1-8818-D
84. 1-8033-C
85. 1-8740-A
86. 1-8033-D
87. 1-8948-A
88. 1-8948-B
89. 1-8948-C
90. 2-8948-C
91. 2-8948-D
92. 2-8956-D (Original)
93. 2-8956-D
94. 2-8956-B
95. 2-8948-A
96. 2-8956-A
97. 2-8949-B
98. 2-8818-D
99. 2-8949-C
100. 2-8949-A

ATTACHMENT #4 - DATA REPORTS WITH UT EQUIPMENT S/N NOT TRACEABLE

#186060 (cont)

101. 2-8948-B
102. 2-8740-A
103. 2-8740-B
104. 2-8818-A
105. 2-8818-B
106. 2-8818-C
107. 1-8949-D
108. 1-8379-B
109. 1-8378-A
110. 1-8379-A
111. #0664
112. 1-8145
113. 1-LCV-460

#710247

1. 1-8372-C
2. 2-8702
3. 2-8701
4. 2-8067-A
5. 2-8067-B
6. 2-8067-C
7. 2-8067-D
8. 2-8057-A
9. 1-8372-C (Replacement)

#7012417

1. 1-8948-A (Replacement)
2. 1-8948-B (Replacement)
3. 1-8948-D (Replacement)
4. 1-8956-A (Replacement)
5. 1-8956-B (Replacement)
6. 1-8956-C (Replacement)
7. 1-8956-D (Replacement)
8. 2-8145
9. 2-PCV-455B (#26N86)
10. 2-PCV-455A
11. 2-8073-A
12. 2-8000-A
13. 2-8000-B
14. 2-8000-C
15. 2-8810-B
16. 2-8949-D (3-7-74)
17. 2-8033-A
18. 2-8033-B
19. 2-8033-C
20. 2-LCV-459 (revised)

7012417 (cont)

21. 2-LCV-459⁺(orig)
22. 1-LCV-460 (Unit #2)
23. #94-1289-76
24. 2-8948-C
25. 2-8063-A
26. 2-8063-A (12-5-73)
27. 2-8057-C
28. 2-8057-D
29. 2-8076
30. 2-8058-A
31. 2-8058-B
32. 2-8058-C
33. 2-8058-D
34. 2-8089-A
35. 2-8089-B
36. 2-8089-C
37. 2-8089-D
38. 2-8075-A
39. 2-8075-B
40. 2-8075-C
41. 2-8063-A (12-5-73)

#701247

1. 2-8088-D (used #1)
2. 2-8810-C
3. 2-8810-D
4. 2-8075-D
5. 2-8088-A
6. 2-8088-B
7. 2-8088-C

#7012717

1. 2-PCV-474
2. 2-PCV-455C
3. 2-PCV-456
4. 2-8956-B
5. 2-8948-D
6. 2-8948-B

#18060

1. #0991
2. #0855
3. #1006
4. 1-8033-B
5. 1-8033-A
6. 1-8701
7. 1-8702

ATTACHMENT #5 - DATA REPORTS WITH UT EQUIPMENT S/N NOT TRACEABLE

#7102417

1. 2-8377
2. 2-8819-A
3. 2-8819-B
4. 2-8819-C
5. 2-8819-D
6. 2-8905-A
7. 2-8905-B
8. 2-8905-C
9. 2-8905-D
10. 2-8367-A
11. 2-8367-B
12. 2-8367-C
13. 2-8372-A
14. 2-8372-B
15. 2-8372-C
16. 2-8372-D
17. 2-8900-A
18. 2-8900-B
19. 2-8900-C
20. 2-8900-D
21. 2-8810-A
22. 2-8063-B
23. 2-8063-C
24. 2-8063-D

ATTACHMENT #6 - DATA REPORTS MICROMETERS WITH S/N NOT TRACEABLE

#01

1. 1-8074-A
2. 1-8073-A
3. 1-8073-B
4. 1-8073-D
5. 1-8949-A
6. 1-8949-B
7. 1-8949-C
8. 2-8378-B
9. 2-8379-A
10. 1-8145
11. 1-LCV-460
12. 1-8379-A
13. 1-8379-B
14. 2-8379-B
15. 1-8378-A
16. 2-8378-B
17. 2-8820
18. 1-8372-B
19. 1-8372-C
20. 1-8033-C
21. 1-8819-B
22. 1-8701
23. 1-8702
24. 1-8033-A
25. 1-8819-A
26. 1-8819-C
27. 1-8819-D
28. 1-8367-D
29. 1-8905-B
30. 1-8377
31. 1-8372-A
32. 1-8905-A
33. 1-8367-B
34. 1-8372-B
35. 1-8367-A
36. 1-8905-C
37. 1-8905-D
38. 1-8145
39. 1-LCV-460
40. 1-8372-C
41. 1-8372-D
42. 1-8367-C
43. 1-8379-D
44. 1-8378-A
45. 1-8379-A
46. #0664

#2109286

1. 2-8073-A
2. 2-8000-B

#22508 MWK

1. 1-8948-A (Replacement)
2. 1-8948-B (Replacement)
3. 1-8948-D (Replacement)
4. 1-8956-A (Replacement)
5. 1-8956-B (Replacement)
6. 1-8956-D (Replacement)

#1

1. #0604
2. #0991
3. #0566
4. #0992
5. #0708
6. #0855
7. #1006
8. #0833
9. 1-8956-A
10. 1-8956-B
11. 1-8378-B
12. 1-8740-B
13. 1-8818-A
14. 1-8818-B
15. 1-8818-C
16. 1-8818-D
17. 1-8033-D

1 - 2

1. 1-8956-C
2. 1-8949-C
3. 1-8956-A
4. 1-8956-B
5. 1-8740-B
6. 1-8818-A
7. 1-8818-B
8. 1-8818-C
9. 1-8818-D
10. 1-8740-A
11. 1-8033-D
12. 1-8033-C
13. 1-8948-A
14. 1-8948-B
15. 1-8948-C
16. 1-8033-A

1-2 (cont)

17. 2-8948-C
18. 2-8948-D
19. 2-8956-C
20. 2-8956-D
21. 2-8948-A
22. 2-8956-A
23. 2-8956-B
24. 2-8948-B
25. 2-8740-A
26. 2-8740-B

#210928C

1. 2-8000-A
2. 2-8810-A
3. 2-8810-C
4. 2-8810-D
5. 2-8949-D (3-7-74)
6. 2-8033-A
7. 2-8033-B
8. 2-8033-C
9. 2-8033-D
10. 2-8702
11. 2-8701
12. 2-LCV-459 (Original)
13. 2-PCV-474
14. 2-PCV-455C
15. 2-PCV-456
16. 2-8956-B
17. #94-12892-76
18. 2-8948-C
19. 2-8948-D
20. 2-8948-B

#2250 MWK

1. 2-8063-C

3471

INTEROFFICE CORRESPONDENCE
THE M. W. KELLOGG COMPANY

TO W.R. FOX
FROM R.G. FINK
SUBJECT ULTRASONIC EXAMINATION OF VALVES

DATE April 17, 1973

On 4/16/73, we received an F.O. from P.G. & E. to ultrasonic test 177 valves. We need some of these valves this week for installation. P.G. & E. had planned on performing this test themselves. Therefore, they purchased the U.T. unit, probes, calibration block, etc. They also wrote the procedure and are in the process of having it approved. We feel in order to perform this test properly, we must resolve the following problems:

1. The P.G. & E. furnished Branson 303B is missing the digital module. Therefore, any thickness measurement will be subject to operator judgment.
2. The P.G. & E. test procedure states the reference block must be acoustically identical. This is impossible and at this time, the P.G. & E. supplied reference block available is forged 316. The valves we need tested, first, are 304. The procedure must be revised or a new block must be ordered.
3. The transducers available are adequate for flat smooth surfaces. There are no adapters shoes or wedges available should they be necessary.
4. At this time, it appears the transducers supplied may not be the correct type for thickness readings. If this is true, we will have to order new transducers.
5. The effect of surface contour and roughness must be tested prior to making any reportable results.
6. There is no available information on the U.T. equipment for review.

It is doubtful that any meaningful results can be obtained at this time and it is definite that none can be reported until the above mentioned problems are solved. We are working on all the above at this time. However, I would like to point out that this is a difficult project and with the equipment supplied us, we could have a few weeks delay.

cc: E.Y. Martindale
R.P. Badger

RGF/bc

ATTACHMENT #7 - DATA REPORTS

No Step Wedge Info Listed

1. 1-8145
2. 1-8475
3. 1-8058-C
4. 1-8701
5. 1-8702
6. 2-8905

No Type of SS List for S.W. Blocks

1. 2-8088-D - only info is QCR (used in #1)
2. 1-8956-A - only info is ASTM A351
3. 1-8956-B - only info is ASTM A351
4. 1-8956-C - only info is ASTM A351
5. 1-8956-D - only info is ASTM A351
6. 1-8033-C - only info is ASTM A182
7. 1-8740-A - only info is ASTM A351
8. 1-8033-D - only info is ASTM A182
9. 2-8145 - only info is Forged SS

Note: Per the ASTM Standard there are several grades of ferritic, martensitic, and austenitic steels included for ASTM A182 and 22 grades of austenitic steel for ASTM A351.

ATTACHMENT #8A - DATA REPORTS FOR VALVES BELOW
MINIMUM WALL THICKNESS IDENTIFIED AS UT ACCEPT ON DATA REPORTS

1. 1-8948-B 5-31-73 (R340)
2. 1-8948-A 5-30-73 (R336)
3. 1-8948-D 6-7-73 (R 377)
4. 2-8820 6-18-73 (#0855) (in Unit #1 Book)
5. 1-8378-B 6-11-73 (R319)
6. 1-8956-D 6-16-73 (R388)
7. 1-8956-C 6-16-73 (R341)
8. 1-8956-B 6-12-73 (R337)
9. 1-8956-A 6-11-73 (R339)
10. S/N 0833 6-12-73 No loc #
11. S/N 1006 6-12-73 No loc #
12. S/N 0855 6-12-73 No loc #
13. S/N 0708 6-12-73 No loc #
14. S/N 0992 6-12-73 No loc #
15. S/N 0566 6-12-73 No loc #
16. S/N 0991 6-12-73 No loc #
17. S/N 0604 6-12-73 No loc #
18. 2-8378-A (#0833) 6-18-73
19. 1-8378-A 6-17-73
20. 1-8379-B (#1006) 6-18-73 (R745)
21. 1-8379-A 6-17-73 (R319)
22. 1-8379-B (#0991-R742) 6-18-73 (Unit #1 Book)
23. 2-8379-B (#R319) 6-18-73 (Unit #1 Book)
24. 2-8378-B (#R742) 6-18-73 (Unit #1 Book)
25. 2-8378-C (In Unit #1 Book) 8-8-73
26. 1-PCV-455-B (#25M367) 8-17-73
27. 1-PCV-455-A (#27N216) 8-17-73
28. U2-PCV-455-B (#26N86) 4-19-74
29. U2-PCV-455-A (#16M361) 4-19-74
30. 2-8063-A 12-3-73(R728)
31. 2-LCV-459 (revised) 1-14-74
32. 2-LCV-459 (original) 1-14-74
33. 2-8063-A 12-3-73 (R728)
34. 2-8948-C 7-16-73 (#94-12892-54)
35. 2-8948-D 7-18-73 (#94-12892-59)
36. 2-8956-C 7-21-73 (#94-12892-52)
37. 2-8956-D 7-26-73 (#94-12892-53)
38. 2-8948-A 7-12-73 (R787)
39. 2-8956-B 7-17-73 (#94-12892-55)
40. 2-8956-A 7-17-73 (#94-12892-56)
41. 2-8948-B 7-12-73 (R786)
42. S/N 0664 6-7-73 (R377)

ATTACHMENT #8B - DATA REPORTS FOR ACCEPTED VALVES
NOT IDENTIFIED ON REPORT AS BEING ACCEPTED - ITEM #7

1. 2-PCV-455B - 2-25-76 S/N 26N86
2. 2-PCV-455A - 2-25-76 S/N 46W210
3. 2-8379-B S/N 0604 2-6-76
4. 2-8379-A - 0708 2-6-76
5. 2-8378-A - 0566 2-6-76
6. 2-8820 - 0659 2-6-76
7. 1-8067-A 501148 1-16-78

THE M.W. KELLOGG COMPANY

A DIVISION OF PULLMAN INCORPORATED

D.R. NO. 1168
ISO. NO. 10-C48Z
UNIT NO. 2
CODE NO. _____

ATTACHMENT
★ 9A

DISCREPANCY REPORT

CUSTOMER: Pacific Gas & Electric SPEC. NO. 8711 DATE: 3-3-73
PROJECT: Diablo Canyon JOB NO. 7177 INSPECTOR: W. Johnson

DISCREPANT ITEM: 10-C48Z Darling Valves

EXPLANATION OF DISCREPANCY:

Below listed valves are below minimum wall requirements:
(See attached data reports)

2-8948-A -57 *	2-8956-A -56 *
2-8948-B -58	2-8956-B -55 *
2-8948-C -54	2-8956-C -52
2-8948-D -59	2-8956-D -53

FOR INFORMATION

RECOMMENDED DISPOSITION:

- 1). Notify P. G. & E. of the above listed discrepancies in the form of a D.R. for record purposes.
- 2). P. G. & E. will provide final disposition instructions on this D.R.
- 3). Until valves are dispositioned they will be placed on hold.

*Accepted per Westinghouse letter, attached.

All others returned to Westinghouse per P. G. & E. 2-28-74

Approved By: M.W.K. Field Q.A. Mgr. [Signature] Date 8-3-73 Customer [Signature] Date 3-1-74

FINAL DISPOSITION: In Accordance With Above

Other (explanation and approval required)

Work Completed Insp: _____ Date: _____

Work Completed Insp: _____ Date: _____

EXPLANATION (IF NECESSARY):

M.W.K. Field Q.A. Manager _____ Date _____ Customer _____ Date _____

EPS TO PREVENT RECURRENCE Not Applicable

Field Q.A. Manager

DISTRIBUTION: Master Q.A. File Auth. Insp Engineering Dept. Other _____
 Customer Receiving Field Inspector _____

ATTACH SKETCH IF NECESSARY

THE M.W. KELLOGG COMPANY

A DIVISION OF PULLMAN INCORPORATED

ATTACHMENT
93

DISCREPANCY REPORT

D.R. NO. 050
ISO. NO. 1-9948-A
UNIT NO. 1
CODE NO. 092000000000000000

CUSTOMER: Pacific Gas & Electric SPEC. NO. 8711 DATE June 4, 1973
PROJECT: Diablo Canyon JOB NO. 7177 INSPECTOR: E. Y. Martindale

DISCREPANT ITEM: Darling check valve 1-8948-A R336 type 10C 48Z

EXPLANATION OF DISCREPANCY:

(~~SN~~ -24)

Area noted on "Data Report Valve Thickness Form" is below minimum 1.310 in.
See attached report.

FOR INFORMATION

RECOMMENDED DISPOSITION:

1. Notify P. G. & E. of discrepancy per this D.R.
2. P. G. & E. to answer on this D. R. for corrective action.

Rejected and returned to Westinghouse per P. G. & E. 2/28/74

Approved By: M.W.K. Field Q.A. Mgr. A. Fish Date 6/16/73 Customer Jiff Date 3-1-74

FINAL DISPOSITION: In Accordance With Above

Other explanation and approval required: 1

Work Completed Insp: _____ Date: _____

Work Completed Insp: _____ Date: _____

EXPLANATION (IF NECESSARY):

M.W.K. Field Q.A. Manager _____ Date _____ Customer _____ Date _____

STEPS TO PREVENT RECURRENCE Not Applicable

Field Q.A. Manager

DISTRIBUTION Master Q.A. File Auth Insp Engineering Dept Other _____
 Customer Receiving Field Inspector I EM

THE M.W. KELLOGG COMPANY

A DIVISION OF PULLMAN INCORPORATED

D.R. NO. 960
ISO NO. 1-89488
UNIT NO. 1
CODE NO. 0820000000000000

ATTACHMENT # 9C

DISCREPANCY REPORT

CUSTOMER Pacific Gas & Electric SPEC. NO. 8711 DATE 6-4-73 (resubmitted 8-7-63)
PROJECT Diablo Canyon JOB NO. 7177 INSPECTOR E. Y. Martindale

DISCREPANT ITEM: DARLING CHECK VALVE 1-8948-B R340 Type 10C48Z

EXPLANATION OF DISCREPANCY: S/N -33

Area noted on "Data Report Valve Thickness Form" is below minimum 1.310 inches.
See attached report.

FOR INFORMATION ONLY

RECOMMENDED DISPOSITION:

1. Notify P. G. & E. of discrepancy per this D.R.
2. P. G. & E. to answer on this D.R. for corrective action.

Rejected and returned to Westinghouse per P. G. & E. 2/28/74

Approved By: M.W.K. Field Q.A. Mgr [Signature] Date - - - Customer [Signature] Date 3-1-74

FINAL DISPOSITION: In Accordance With Above Other explanation and approval required
Work Completed Insp: _____ Date: _____ Work Completed Insp: _____ Date: _____

EXPLANATION (IF NECESSARY):
[Large circled area]

M.W.K. Field Q.A. Manager _____ Date _____ Customer _____ Date _____

STEPS TO PREVENT RECURRENCE Not Applicable

DISTRIBUTION: Master Q.A. File Auth. Insp. Engineering Dept. Other _____
 Customer Receiving Field Inspector [Signature]

ATTACH SKETCH IF NECESSARY

ATTACHMENT #10 - DATA REPORTS WITH VALVES BELOW MINIMUM WALL NOT ID'ed ON DR's

	<u>Location</u>	<u>Type</u>	<u>SN</u>	<u>Date</u>	<u>Min Allow</u>	<u>Min Obtained</u>	
1.	2-8379-A	3C58	#0991 R742	6-18-73	.625	.575	*
2.	1-8379-B	3C58	#1006 R745	6-18-73	.625	.585	+
3.	2-8378-A	3C58	#0833 R742	6-18-73	.625	.580	F
4.	No location #	3C58	#0991 R742	6-12-73	.625	.575	*
5.	No location #	3C58	#0855 QCRO7572 R745	6-12-73	.625	.575	#
6.	No location #	3C58	#1006 QCRO7572 R745	6-12-73	.625	.585	+
7.	No location #	3C58	#0833 QCRO7073 R742	6-12-73	.625	.580	F
8.	2-8820	3C58	#0855 R745	6-18-73	.625	.575	#
9.	1-8820	3C58	R377	6-7-73	.625	.500	
---Data Report under remarks states "return to Westinghouse 2-8475 DR1031".							
But DR 1031 indicates delete from explanation of discrepancy.-----							
10.	II-PCV-455A	4RA58RGA	#6910 16M361	12-12-75	.750	.590	
11.	2-PCV-455B	4RA58RGA	#13088-1 96N86	12-9-75	.750	.440	
12.	2-PCV-455B	4RA58RGA	#26N86	11-17-75	.750	.505	
13.	2-PCV-455A	4Ra58RGA	#46W210	11-17-75	.750	.630	

- * Same valve but different Data Reports, tested on different dates.
- +
- # Same valve but different Data Reports, tested on different dates.
- # Same valve but different Data Reports, tested on different dates.
- # Same valve but different Data Reports, tested on different dates.

DIABLO CANYON
NUCLEAR POWER PLANT

Unscheduled
AUDIT NO.: 34

DATE: 11-18-82

10 CFR 50 B XVII
Westinghouse Letter #PG&E 2080
(7-25-72)

ESD 236, AEC Letter(6-20-72), PG&E DR #103-R1, ASTM E114-63

QUALITY ASSURANCE RECORDS

AUDIT CRITERION

REFERENCE DOCUMENTS:

OBSERVATION

ACTIVITY:

Quality Assurance Records

PROGRAM REQUIREMENT

I. U.S. Atomic Energy Commission
Letter - 6-20-72

A. ESD 236 - Ultrasonic Thickness Measurement of Boundary Valves was identified on Internal Audit #101 as not having a Procedure Qualification Record. I. A. #101 revealed that ESD 236 was not a nondestructive testing procedure but a procedure to measure material thickness. It was determined by the QA/QC Manager that a Procedure Qualification Record was not needed for ESD 236.

B. Subsequent investigation has identified that measurement of these valves was performed to assure minimum wall thickness as required by the U.S. Atomic Energy Commission in their letter of 6-20-72 for "valves important to nuclear safety" installed or to be installed at the Diablo Canyon Nuclear Plant. PG&E Discrepancy Report #103-R1 identifies the individual valves to be measured will be as shown on Westinghouse letter #PG&E 2080, dated 7-25-72. The valves identified in the Westinghouse letter are called out as "Class I valves which make up the reactor coolant pressure boundary" and are part of the piping systems designated as seismic Class I by PG&E in their Contract Specification 8711. M. W. Kellogg (Pullman Power Products) provided ESD 236, which was approved by PG&E, to implement the valve body wall thickness measurement by an ultrasonic method as required by the A.E.D. letter of 6-20-72.

C. Unscheduled Internal Audit #34 was performed to determine if ESD 236 and the various referenced source document requirements were implemented. The audit results are as follows:
There is no documented evidence of "procedure verification tests" to determine that transducers used in the inspections were of a suitable frequency, size and adapted with shoes, wedges, or saddles as each valve measurement requires. This a nonconformance to ESD 236, 6.7. Interoffice Correspondence by R.G. Fink, dated 4-17-73, concerning "Ultrasonic Examination of Valves" states that as of that date there were no adapter shoes or wedges available. It also states that

1.0 Section
supp. 6.1

AMERICAN ELECTRICITY
REGION V

3111 Broadway Way
Berkeley, California 94704

June 28, 1977

Pacific Gas and Electric Company
37 Main Street
San Francisco, California 94104
Attention: Mr. Frederick T. Swartz
(New Francisco and Concord Offices)

Continued

Information obtained during inspections conducted by the Westinghouse Regulatory Operations has disclosed that a number of facilities have been equipped with valves with wall thicknesses below the stipulated minimums. In other instances, licenses have not been able to document whether or not this information was disclosed to the licensee. The majority of this subject has disclosed the licensee whether it was limited to any class of licensee or valve supplier.

In light of the above information, you are requested to verify, through manufacturer records or other satisfactory means, the wall thickness of the valves installed at the plant site. In the event that verification records are available, you are requested to advise this office within thirty (30) days of your plant and schedule for administration by suitable alternate means that valves important to nuclear safety installed or to be installed at the plant site, and in addition this office within thirty (30) days of the date of this letter if wall records are available and when our inspector may examine them at the plant site.

In the event that records are not currently available, you are requested to advise this office within thirty (30) days of your plant and schedule for administration by suitable alternate means that valves important to nuclear safety installed or to be installed at the plant site. This information will be maintained current with jurisdictional authorities.

DIABLO CANYON
NUCLEAR POWER PLANT

QUALITY AUDIT CHECKLIST

AUDIT NO.: 34

DATE: 11-18-72

AUDIT CRITERION

REFERENCE DOCUMENTS:

See page 1

QA Records

ACTIVITY:

OBSERVATION

PROGRAM REQUIREMENT

I. A. E. C. LETTER #3

Pacific Gas and Electric Co. 3 June 30, 1973

The valves which require demonstration of acceptable wall thickness are the following:

- (a) Each valve within the reactor coolant pressure boundary, as defined in subsection 16.15(f) (Code and Standards) of 10 CFR 50, where the valve is:
 - (1) Over 1-inch nominal pipe size for pressurized water reactors.
 - (2) Over 1 1/2-inch nominal pipe size in water lines for boiling water reactors.
 - (3) Over 3 (3)-inch nominal pipe size to steam lines for boiling water reactors.

The following techniques are considered to be a sufficient demonstration of acceptable wall thickness. Alternative techniques may be approved, but there is no assurance that they will be found acceptable:

- (1) Documented direct physical measurements of actual wall thickness with comparison to specified minimum wall thickness.
- (2) Documented results of ultrasonic measurements of wall thickness using the following techniques:
 - (a) Eddy current testing.
 - (b) Time-of-flight testing.
 - (c) Resonance testing.
 - (d) Acoustic emission testing.
 - (e) Guided wave testing.
 - (f) Acoustic emission testing.
 - (g) Acoustic emission testing.
 - (h) Acoustic emission testing.
 - (i) Acoustic emission testing.
 - (j) Acoustic emission testing.
 - (k) Acoustic emission testing.
 - (l) Acoustic emission testing.
 - (m) Acoustic emission testing.
 - (n) Acoustic emission testing.
 - (o) Acoustic emission testing.
 - (p) Acoustic emission testing.
 - (q) Acoustic emission testing.
 - (r) Acoustic emission testing.
 - (s) Acoustic emission testing.
 - (t) Acoustic emission testing.
 - (u) Acoustic emission testing.
 - (v) Acoustic emission testing.
 - (w) Acoustic emission testing.
 - (x) Acoustic emission testing.
 - (y) Acoustic emission testing.
 - (z) Acoustic emission testing.
- (3) Wall thicknesses, verified by either of the above techniques, to be not less than 90% of specified minimum wall thickness will be acceptable, provided that the documented mechanical characteristics of the material exceed the specification minimum values sufficient to compensate for the measured reduction in wall thickness.
- (4) "Specified minimum wall thickness," as used above, means the wall thickness required by the actual code and standards (e.g., ASME B31.1 (1965); ASME B31.3 (1963); ASME B16.3, (1953-64) in effect on the date of the purchase order.

It appears that the transducers supplied may not be the correct type for thickness readings. No subsequent documentation has been found which indicates that these problems were resolved although the correspondence indicated problems were being worked on.

None of the Valve Wall Thickness Data Reports list the size of transducer, shape of transducer and type designation (manufacturer's designation or description. This is a nonconformance to ASTM E114-63, 6.1.2, and ESD 236.3.2 and 5.1. The Data Reports require that a serial number be listed for the transducer used to make the inspections. There are six of the audited Data Reports that do not list a transducer serial number. This is a nonconformance to ESD 236.4.1 and 8.3. See attachment #1 for the list of Data Reports.

There are nineteen of the audited Data Reports which do not list the testing frequency or nominal frequency of the transducers used to make the inspections. This is a nonconformance to ASTM E114-63, 6.1.1 and 6.1.2.3, ESD 236.3.2, 5.1, 4.1, and 8.3. See attachment #1 for a list of Data Reports.

D. Three of the audited Data Reports do not list the type couplant used to make the inspections. This is a nonconformance to ASTM E114-63, 6.1.3, ESD 236.6.3, 4.1, 8.3, 3.2 and 5.1. All the other Data Reports list glycerine as the type couplant. The lack of type couplant appears to be an error omission by the UT Inspector. See attachment #1.

E. Data Reports were examined for UT and micrometer equipment information. Seven of the audited Data Reports do not list a serial number of the ultrasonic test equipment used to make the inspections. See attachment #1. Fourteen of the audited Data Reports do not list a serial number for the micrometers used to check the calibration accuracy on the valves by a mechanical means. There are nineteen Data Reports that list both the Nortec NDT-120, SN 12224 and the Branson Sonoray Model 303B, SN 18060, as the ultrasonic test equipment used to make the valve measurements. But there is only one set of calibration information and valve body measurement results for each Data Report. There is no way

DIABLO CANYON
NUCLEAR POWER PLANT

QUALITY AUDIT CHECKLIST

Unscheduled
AUDIT NO.: 34

DATE: 11-18-82

ACTIVITY:

QA Records

REFERENCE DOCUMENTS:

See Page 1

AUDIT CRITERION

OBSERVATION

PROGRAM REQUIREMENT

I. A.E.C. Letter pg 3

Electric Co. and Electric Co. 3 June 28, 1972

- (1) Copies of your values may have, for permanent use... (text partially obscured)
- (2) In certain instances, you may wish to request values found to have will fluctuate below the specified station. In such instances, you are requested to provide to this office a description of the process in the work area, including acceptability of the process to the work area. Such a process procedure should also be submitted to you (10) copies.

Acceptable documentation of compliance with the above requirements must be completed within three (3) years of the date of this letter.

Sincerely,

E. W. Smith
Director, Region V
Directorate of
Regulatory Operations

cc: System Record, Diablo by Nuclear Power Station
J. B. Smith
Director, RUC

to determine the actual UT equipment used to make the inspections for the purpose of traceability. See Attachment #2.

There are 207 Data Reports that list UT test equipment that have serial numbers that are not traceable to M.W. Kellogg (Pullman), PG&E General Construction or manufacturer's documentation for certification of equipment calibration. There are seven UT test equipment models with different serial numbers listed on these reports. The UT test equipment listed are:

1. Branson Sonoray 301 SN #710247
2. Branson Sonoray 301 SN #7012417
3. Branson Sonoray 301 SN #701247
4. Branson 301 SN# 7012717
5. Branson Sonoray 301 SN #7102417
6. Branson 303 SN #186060
7. Branson 303 SN #18060

See attachments #3, #4 and #5 for the list of Data Reports. Internal Auditor H. Hudson reviewed M.W. Kellogg (Pullman) and PG&E general construction calibration records and could not find any certification of equipment calibration. PG&E General Construction Engineering Aide, Brad Anderson, was requested to research PG&E documentation for any calibration records, but was unable to provide any information. One UT machine was traceable - Branson Mark I, SN 742101. There are 84 Data Reports that list micrometers that have serial numbers that are not traceable to M.W. Kellogg (Pullman), PG&E General Construction or manufacturer's documentation for certification of equipment calibration. There are seven micrometer serial numbers listed on the Data Reports. These micrometer serial numbers are:

DIABLO CANYON
NUCLEAR POWER PLANT

Unscheduled
AUDIT NO.: 34

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QUALITY AUDIT CHECKLIST

AUDIT CRITERION

REFERENCE DOCUMENTS:

See page 1

OBSERVATION

1. # 22508MMK
2. # 01
3. # 1-2
4. # 1
5. # 2109286
6. # 210928C (1)
7. # 2250 MWK

Both M.W. Kellogg (Pullman) and PG&E General Construction calibration records were examined but no records were found. Two serial numbers, #2250-C MMK and #210928, were numbers for the same micrometer and were traceable to MMK calibration records. See attachment #6 for a list of Data Reports for untraceable micrometers. There is a PPP micrometer SN QA #1 but it was purchased on 2-20-75 while the listed micrometer serial numbers 1 and 01 were used in 1973 and 1974. See attachment #6. The above listed discrepancies are a nonconformance to ESD 236.4.1, 4.2, 6.5, 8.3 and the Data Report Form, figure #2.

The type of UT test equipment was reviewed. ESD 236 under scope states that "this procedure is based on pulse echo digital readout equipment as specified in PG&E Report 103-RI". There is no documented evidence that PG&E DR 103-RI requires the use of digital readout equipment. The PG&E Mechanical Test Procedure attached to PG&E DR 103-RI and ESD 236 list two types of Ultrasonic thickness testers. One is a Nortec Model NDT-120 which is a meter type. The other tester is a Branson Sonosray 303B. There is no specific reference in the PG&E documentation to digital readout equipment. A M.W. Kellogg Interoffice Correspondence, dated 4-17-73, from QA/QC Manager, R.G. Fink, attachment #6A, states "the PG&E furnished Branson 303B is missing the digital module". No subsequent documentation has been found indicating that the referenced Branson 303B was later adapted with a digital module. Since

ACTIVITY:

QA Records

PROGRAM REQUIREMENT

II. PG&E DR #103-RI

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BY: [Signature]

FOR: [Signature]

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DIABLO CANYON
NUCLEAR POWER PLANT

Unscheduled AUDIT NO.: 34
DATE: 11-18-82

QUALITY AUDIT CHECKLIST

AUDIT CRITERION

REFERENCE DOCUMENTS:

See Page 1

ACTIVITY:

OBSERVATION

PROGRAM REQUIREMENT

III. Westinghouse Letter #PG&E
2080 (7-25-72).
PACIFIC ELECTRIC CORP. 1980

Set up accounts to be checked per PG&E 2080
check per PG&E 2080

418-004
W. W. Kelly
PACIFIC ELECTRIC CORP.
1980
San Francisco, California 94111

PACIFIC GAS AND ELECTRIC COMPANY
NUCLEAR PLANT, Diablo Canyon Site
UNIT 1 AND 2
Vallejo, California 94592

In PG&E 2080 dated Feb. 7, 1972, we stated that we would develop a program to comply with the requirements to define the wall thickness of all valves over one inch nominal pipe size within the reactor coolant pressure boundary.

The program consists of defining the valves within Westinghouse scope to be investigated, defining which items of the valves should be tested and what test equipment should be used.

Plans filed attached a completed list of valves, supplied by Westinghouse. This list includes information number, valve ID, number, drawing number, customer wall thickness (t₂), and valve manufacturer. These are Class 1 valves which make up the reactor coolant pressure boundary.

Figures 1 and 2, attached, show the areas which should be investigated for aluminum wall thickness. Note that the pressure safety valves are the B-44a Class valves 1 and 2 were designed to meet the requirements of Article 9 of the ASME Boiler and Pressure Vessel Code, Section III (NB-3200). The valves were not designed to meet the aluminum wall thickness requirements of ASME B16.3. The pressure safety valve body to use the pressure vessel body from the ASME, which is covered into the body, and the ASME is the pressure containing component of the valve. The ASME is the pressure containing component, if specified, without strengthening the valve.

no calibration or other records have been located for the seven Branson models including the 303B models referenced in paragraph E above it is unknown if these testers were digital readout or cathode ray tube. This an item of concern requiring supervisory attention.

ASTM E114-63.2.3.2 states that "thickness may be determined from one side by observing the spacing of the multiple reflections or reverberations on the cathode ray tube over a given distance on the screen". ESD 236 which is based on digital readout equipment per the scope of the procedure does not meet the requirement of ASTM E114-63.2.3.2 to use cathode ray tube equipment as required elsewhere in the procedure. The use of digital readout equipment as referenced in the scope of ESD 236 is a noncompliance to ESD 236.3.2 and 5.1 and ASTM E114-63.2.3.2.

UT tester Branson Mark I, SN 742101, which has calibration records is a cathode ray tube type and meets the requirements of ASTM E114-63 but does not meet the scope of ESD 236.

Data Report information concerning calibration was examined. Linearity was established by taking multiple readings on the step wedge block. Thickness was established by measuring the step wedge block by UT.

Six Data Reports do not list any information concerning the step wedge blocks used for calibrating the UT test equipment. There is no way to determine if the step wedge calibration blocks are of material acoustically similar to the material to be measured. This a nonconformance to ESD 236.5.2, 6.6, 7.2.1, 7.2.4, 4.1 and 4.2. See attachment #7 for the list of Data Reports.

There are nine Data Reports that do not list the type of stainless steel the step wedge blocks are made from. Per the Interoffice Correspondence by R. Fink, dated 4-17-73, the reference blocks are suppose to be type 316 or 304. See attachment #7 for the list of Data Reports. This is a nonconformance to ESD 236.5.2, 6.6, 7.2.1, 7.2.4, 4.1 and 4.2.

DIABLO CANYON
NUCLEAR POWER PLANT

QUALITY AUDIT CHECKLIST

ADDITIONAL NO.: 34

DATE: 11-18-82

AUDIT CRITERION

REFERENCE DOCUMENTS:

See page 1

ACTIVITY:

QA Records

PROGRAM REQUIREMENT

OBSERVATION

III. Westinghouse letter, page 2

One Data Report, location #2-8819-B, does not list a pre-operations calibration check on the valve by mechanical and UT means but does have a post calibration check.

Data Reports for locations #2-8057, #2-8956-B (7-17-73) and #2-8948-C (7-16-73) do not have the signature of the person performing the measurement and post calibration check.

Data Report 1-8956-B (Replacement) does not have the signature of the person performing or the date of the measurement and post calibration check.

Two Data Reports, SN 0566 and SN 1006 (no location #'s listed) do not have readings for the measurement and post calibration check, actual step thickness, ultrasonic readings and calibration check by mechanical and UT means.

Data Report for location #1-8702 does not have readings for the post calibration check by a mechanical and UT means. There is a pre-operations check.

There are six Data Reports that do not have the required measurement and post calibration information for the person performing and the date of the check, the actual step thickness and ultrasonic readings, and the calibration check by a mechanical and UT means. The Data Reports are: SN 0991, SN 0992, SN 0708, SN 0855, SN 0833 and SN 0604.

The above items are nonconformances to ESD 236.7.2.a, 7.2.c, 7.2.2, 7.2.3, 7.2.4 and 4.2.

H. Data Reports were examined to determine if the calibration checks were accurate within 2%. It was determined by the NDE Leadman that the pre and post calibration check could demonstrate repeatability and accuracy if the pre and post calibration readings were not more than 2% different. The following Data Reports do not have the 2% accuracy.

Data Report, location # 1-8067-C, has a pre-calibration check that list the step wedge material actual step thickness for reading #C as .497. The pre-calibration UT reading for # C was .500. The post calibration actual step thickness reading for #C was .497. But the post calibration UT reading for #C was .45. The accuracy

The Westinghouse location data provided by the "Source and Sink" is shown as provided for this program. The accuracy of the data and observations is required to be in accordance with the QC program requirements of the program.

If you have any questions with regard to this program, please do not hesitate to contact me.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION

A. J. Spivey
A. J. Spivey
Project Engineer

APPROVED: A. J. Spivey
J. W. Bell
Project Manager

NO
DATE: 11-18-82

DIABLO CANYON
NUCLEAR POWER PLANT

QUALITY AUDIT CHECKLIST

Unscheduled
AUDIT NO.: 34

DATE: 11-18-82

AUDIT CRITERION

ACTIVITY:

REFERENCE DOCUMENTS:

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III. Westinghouse Letter, pg 3

#s 10% off. The actual lowest valve body measurement was .510 and and the minimum wall allowed was .437. ESD 236.7.2.2. Data Report, location # 1-8956-C (11-29-73 Replacement), has a pre-calibration check by mechanical means that is 1.062 and the UT reading is 1.050. The post calibration check on the valve by a mechanical means reads 1.062. The UT reading was 2.050. The accuracy is approximately 48% off. The minimum allowed wall thickness is 1.310 and the minimum obtained was 1.475. This is a nonconformance to ESD 236.7.2.3. Data Reports, location #2-PCV-455B (2-25-76, SN 26N86) and location # 2-PCV-455A (2-25-76, SN 46W210) have pre and post calibration checks by a mechanical means that read .760. The UT readings were .780. The accuracy is approximately 2.6% off. The minimum allowed wall thickness is .750 and the minimum obtained was .750. This is a nonconformance to ESD 236.7.2.3.

I. There are three Data Reports, locations # 1-8702, # 1-8089-D and # 1-8058-D, that do not record the lowest reading obtained on the data report form item #6. This is a noncompliance to ESD 236.7.3.3, 8.3, and 4.1. These reports do have readings for the grid lay out valve body measurement.

There are 42 Data Reports that list the minimum wall measurement obtained as below the minimum allowed wall thickness, but the valve's Data Reports are signed per the ESD 236.7.3.5 requirement "for valves that meet the minimum wall thickness requirements." These 42 Data Reports have item #7 of the report form signed indicating "valve identified per step 7.3.5". ESD 236.7.3.5 requires acceptable valves be identified by adding TM (thickness measured) followed by the valve location number on the valve by vibra tool and attaching a plain white tag with the name of person

2-050	ESD 236.7.2.2	0.4	0.45
2-051	ESD 236.7.2.2	0.5	0.55
2-052	ESD 236.7.2.2	0.4	0.45
2-053	ESD 236.7.2.2	0.6	0.65
2-054	ESD 236.7.2.2	0.6	0.65
2-055	ESD 236.7.2.2	0.6	0.65
2-056	ESD 236.7.2.2	0.6	0.65
2-057	ESD 236.7.2.2	0.6	0.65
2-058	ESD 236.7.2.2	0.6	0.65
2-059	ESD 236.7.2.2	0.6	0.65
2-060	ESD 236.7.2.2	0.6	0.65
2-061	ESD 236.7.2.2	0.6	0.65
2-062	ESD 236.7.2.2	0.6	0.65
2-063	ESD 236.7.2.2	0.6	0.65
2-064	ESD 236.7.2.2	0.6	0.65
2-065	ESD 236.7.2.2	0.6	0.65
2-066	ESD 236.7.2.2	0.6	0.65
2-067	ESD 236.7.2.2	0.6	0.65
2-068	ESD 236.7.2.2	0.6	0.65
2-069	ESD 236.7.2.2	0.6	0.65
2-070	ESD 236.7.2.2	0.6	0.65

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<p>III. Westinghouse Letter, page 4</p> <p>QA Records</p>	<p>performing the measurement, date, valve identification and serial number. Below minimum wall valves having their Data Report Item #7 signed is a nonconformance to ESD 236.7.3.5. See attachment #8A for the list of Data Reports.</p> <p>There are seven Data Reports which indicate the valves have acceptable wall thickness but item #7 of the report form is not signed indicating "valve identified per step 7.3.5". There is no documented assurance that accepted valves were identified by adding TM followed by the valve location number on the valve by vibra tool marking and attaching a white UT accept tag. This is a nonconformance to ESD 236.7.3.5. See attachment #8B for list of Data Reports.</p> <p>One of the ESD 236.7.3.4 requirements for valves that are below minimum thickness was implemented for the 42 valves referenced above. The extend of the thin area was determined and recorded on a sketch with dimensions and location information. But the second requirement that the valves be processed per MFI-1-7 could not be verified. Neither Pullman (Kellogg) or PG&E Mechanical Dept. or PG&E QC Dept. could provide a copy of the procedure. The procedure had been superseded and PG&E had discarded it. This is an item of concern requiring supervisory attention.</p> <p>K. Twelve M.W. Kellogg (Pullman) Discrepancy Reports were identified as being generated to report valves found to be below minimum wall requirements. Three of these DR's do not have a signature and date for the Final Disposition indicating work completed. The DR's are:</p> <ol style="list-style-type: none"> 1. DR 1168 - Valve Locations - 2-8948-A, B, C, D 2-8956-A, B, C, D 2. DR 959 - Valve Location - 1-8948-A 3. DR 960 - Valve Location - 1-8948-B 	

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III. Westinghouse Letter, pg 6

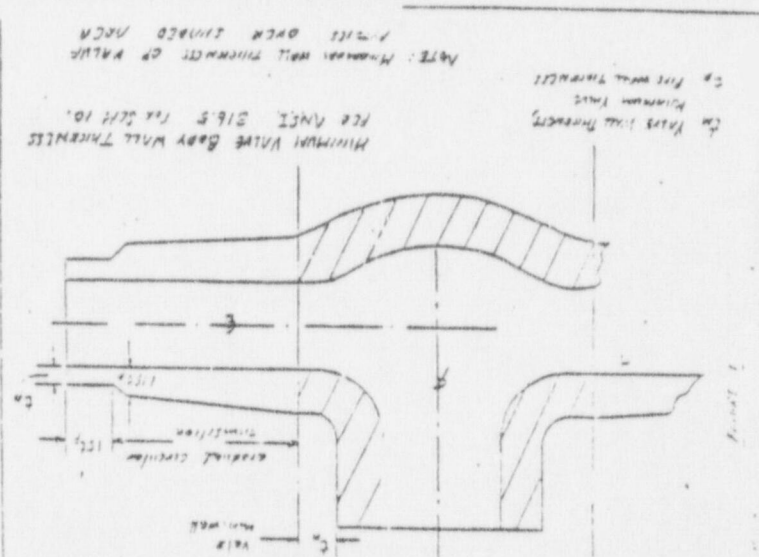
15" west of weld #WB293, Location # 2-8702 has an arc strike in the valve near the ID tag. Location # 1-8956-A, valve bonnet flange has two bolts that are not fully engaged with the nuts. Bolt #16 is approximately 2 nut threads below face of nut and bolt #10 is approximately 1 nut thread below the face of the nut.

Eleven Data Reports indicate "flat pad at bottom of casting inspected only for thickness". These reports had only two or three readings made and the valves were accepted based on these readings. This is a nonconformance to ESD 236.7.3.1 and Westinghouse letter # PG&E 2080, Figure #1 and Figure #2. The valve locations are:

- A. 1-8948-A (11-28-73)
- B. 1-8948-B (11-29-73)
- C. 1-8948-D (11-29-73)
- D. 1-8956-A (11-29-73)
- E. 1-8956-B (11-29-73)
- F. 1-8956-C (11-29-73)
- G. 1-8956-D (11-29-73)
- H. 12-8948-C (1-17-74)
- I. 2-8948-D (1-17-74)
- J. 2-8948-B (1-17-74)
- K. No loc # ID #94-12872-76 (1-21-74)

Item No.	Location	Tag No.	Tag Description	Tag Date	Tag Status
6-CEB	2-8702	16	ARC STRIKE	11-18-82	Open
1-8956-A	1-8956-A	16	MISSING BOLT	11-18-82	Open
1-C-102	1-C-102	10	MISSING BOLT	11-18-82	Open
0-C-402	0-C-402	10	MISSING BOLT	11-18-82	Open
1-8948-A	1-8948-A	10	MISSING BOLT	11-18-82	Open

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<p>III. Westinghouse Letter, page 7</p> 	<p>OBSERVATION</p> <p>N. Westinghouse Letter #PG&E 2080 list the valves that are to be investigated for minimum wall thickness. There are 14 valves listed on the Westinghouse letter for which there is no documented evidence of being UT examined for minimum wall thickness. This a nonconformance to the Westinghouse Letter and PG&E DR 103-R1. These valves are:</p> <p style="margin-left: 40px;">Location # 1-8010-A, B, C 2-8010-A, B, C 1-8368-A, B, C, D 2-8368-A, B, C, D</p> <p>M. W. Kellogg documentation indicates these valves deleted but there is no explanation for the deletion. Locations # 2-8010-A, B, C valves were examined and found to have ASME NB Code stamps. Locations # 2-8368-A, B, C, D valves were examined but no code stamps were found.</p> <p>O. Five individuals were identified as performing the ultrasonic measurements. A review of personnel files revealed all were certified per ASNT-TC-1A Supplement C. The personnel checked were:</p> <ul style="list-style-type: none"> A. Paul Dawson B. Donald Geske C. Ray Crosno D. Ed Martindale E. Warren Johnson <p>P. Many Data Reports were found to have information whited out and new information</p>	

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inserted. The worst example is location #1-LCV-459. The following information was whited out and new information inserted.

- A. Step wedge material
- B. All pre-calibration step wedge readings, actual and UT
- C. Five dates listed on the report were changed from 8-16-73 to 8-17-73;
- D. Many of the valve body measurement readings.
- E. All post calibration step wedge readings, actual and UT
- F. Minimum allowed all thickness.

This is an item of concern requiring supervisory attention.

PROGRAM REQUIREMENT

III. Westinghouse Letter, pg 8

REVISION BY: 68113 THE COLLEGE, P. 1000

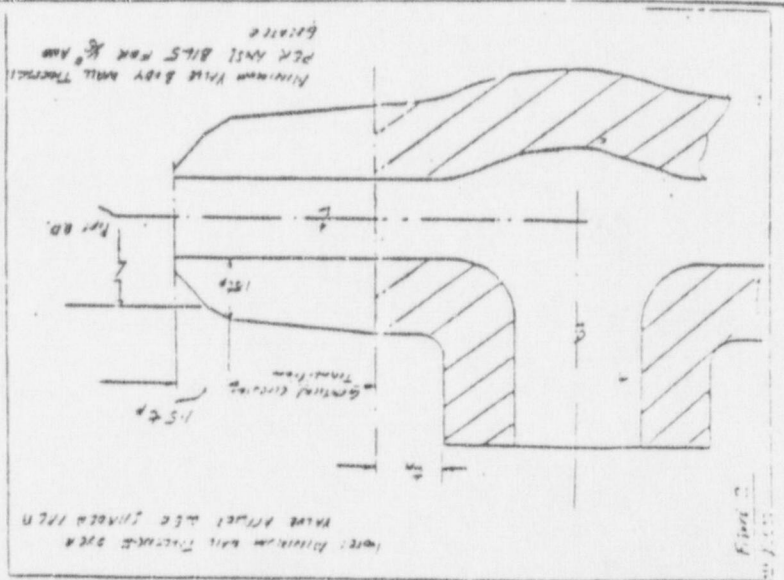


Fig. 2
1-1-82

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PROGRAM REQUIREMENT

IV. ESD 236-Ultrasonic Thickness
Measurement of Boundary Valves

ENGINEERING  SPECIFICATION

DATE: 10/11/82
BY: P. J. S.

ENGINEERING DEPARTMENT

ULTRASONIC THICKNESS MEASUREMENT

1. **ISSUE**
 - 1.1 This procedure provides a method to ultrasonically measure the Reactor Control System boundary valves' thickness to assure minimum wall thickness requirements are met. This procedure is based on pulse echo digital read out equipment as specified in P.E. & E. Report 104-4-1.
2. **RESponsIBILITY**
 - 2.1 No mechanical Assistant Engineer is responsible for this procedure.
3. **REFERENCE**
 - 3.1 Engineering letter 104-1000 dated July 15, 1977
 - 3.2 A.S.E. 1118-42 Ultrasonic Testing by the Institution of Mechanical Engineers (original issue indicated by Direct Contact).
 - 3.3 ASEP 11-1-78, Paragraph C
 - 3.4 104-1-1-77
 - 3.5 P.E. & E. Specification Report No. 101-85
4. **PROCEDURES**
 - 4.1 A record book (Form 104-1000) will be maintained on the data recorded during the thickness measurements. The data recorded will include (sample) valve identification and transmittivity of the thickness measurement.
 - 4.2 Calibration of test equipment will be performed on each valve measurement. Certification of equipment calibration from the manufacturer will be on file at the site.
 - 4.3 Personnel certification will be on file at the site for inspection and data recording. Certification will be on file at the site for Level II Inspector at least 111 personnel in accordance with 104-10-18, Paragraph C.

See attached drawing

N/A

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IV. ESD 236, page 2

ENGINEERING  SPECIFICATION SPEC. NO.
1111
REV. 2-79

ENGINEERING DEPARTMENT

5. MEASUREMENT OF TEST METHODS

5.1 Thickness measuring will be accomplished by ultrasonic testing using the ultrasonic method. The recommendation of using ultrasonic testing by the detection method will be followed.

5.2 Calibration of test equipment will be performed prior to measuring each valve. Calibration will be made on test blocks of material acoustically similar to the valve body and then checked by ultrasonic testing to determine that the test blocks are more than 2% from the reference block to be measured within the tolerance of the test method. The transmitter mechanism can be recalibrated by using the following formula setting at least three readings at various thickness points:

$$d = \frac{100 + 100 - 100}{100 - 100} \times 100$$


where d is correction factor
100 is before body reading
100 is mechanical reading

5.3 Personnel and uniform equipment calibration and unit thickness measuring will be performed on test blocks of Imperial or Inconel III material per 352-10.16, Paragraph 2.

N / A

6. EQUIPMENT AND MATERIALS
- 6.1 Ultrasonic thickness tester, Model 807-130 or equivalent.
 - 6.2 Ultrasonic thickness tester, Brown Sonotek Model 3030 or equivalent.
 - 6.3 Couplant fluid used by this procedure will be either a medical grade of petroleum or glycoline. Calibration and measuring will be performed with the same type of couplant.
 - 6.4 Cleaning equipment consisting of clean lint-free rags, steam sprayer or equivalent and deionized water.
 - 6.5 Calibrated atmosphere for thickness gauge from zero to four inches.

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ENGINEERING	 SPECIFICATION	SPEC. NO. 48_R-118
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<p>6.6 Size wedge calibration blocks of material immediately stable to the material to be measured.</p> <p>6.7 Transducers will be of suitable frequency, size, and design with time, output, or stability as such value measurement requires, as determined from procedure verification tests.</p> <p>6.8 Any sensor equipment or materials that are to be used shall meet the quantitative condition of 6.6 at the location.</p>		
<p>7. MEASURING PRACTICES</p> <p>7.1 Preparation</p> <p>7.1.1 Notify the site Metallurgical Nuclear Energy Systems (MNES) prior to starting work. Any value obtained may be required to be witnessed by a Metallurgical representative.</p> <p>7.1.2 Notify as required, either the Plant Health or the MNES, of any calibration or testing of the transducer. The MNES shall be notified of any change in the calibration or testing of the transducer.</p> <p>7.1.3 As each value is removed from storage preparation for measurement, clean the surface as required to ensure good transducer contact.</p>		
<p>7.2 Calibration</p> <p>Items 7.1.1 through 7.1.3 will be accomplished as required by the following:</p> <ul style="list-style-type: none"> (a) Refer to measuring each value (b) Refer each value to the calibration (c) At the completion of each value (d) At any time that may indicate a change in the calibration (e) At any time a change is made in any major component of the measuring system, such as transducer, sensor, or calibration. <p>If a change in calibration is noted when performing steps "b", "c", "d", or "e" above, all measuring performed since step "a" will be repeated.</p> <p>7.2.1 Select a size wedge block of material sensitively stable.</p>		

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W / A

DIABLO CANYON
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<p>Ur scheduled AUDIT NO.: 34</p>	<p>DATE: 11-16-82</p>
<p>ACTIVITY:</p>	<p>QA Records</p>
<p>PROGRAM REQUIREMENT</p> <p>IV. ESD 236, page 5</p>	<p>AUDIT CRITERION</p> <p>REFERENCE DOCUMENTS: See Page 1</p> <p>OBSERVATION</p> <p style="text-align: center; font-size: 2em;">N/A</p>

ENGINEERING  SPECIFICATION SPEC. NO.
VII
ES - 216

ENGINEERING DEPARTMENT

- grid pattern for the surface value body shape that will be taken. For values that have film direction markings, establish the 1/4 position on top of the marking. For all other values, electrical wire "1" or "2" marks the correct flange above the middle wire for the 1/4 position.
- For values where not applicable to this figure, such as roller valves, create a field sketch at the time of measuring that will show the grid pattern used. Attach the sketch to the data report form.
- For values also shown in the table, use a new test grid and use a new test grid for values larger than 1/4 inch long.
- 7.2.2 Record all readings on the data report form. If a non-zero condition such as raised casting numbers or irregularities are noted, contact an adequate number of qualified grid locations. Attach a reading of these in the location as possible.
- 7.2.3 Evaluate the measurement results per the value list attached to multipurpose letter ESR-1060 and record the minimum unit thickness obtained and the lowest reading obtained on the data report form.
- 7.2.4 If a better minimum thickness area is noted:
- (1) Measure the extent of the thin area and record on a sketch with dimensions and location information.
 - (2) Process the value per 601-1.7.
- 7.2.5 For values that meet the minimum unit thickness requirements:
- (a) Identify the value on the body sketch flange if possible or on a suitable body area by adding the identification number to the value location. The value location area shall be identified on the sketch. The letter measurement 1/4 inch high shall be at the electrical terminals are acceptable marking method.

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
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ENGINEERING  SPECIFICATION SPEC. NO.
E111
ES 2-118

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(a) Attach a plain white tag with the following information:

By _____ Date _____
 valve identification _____ (type, size,
 location number, etc.)

7.3.5 Verify that the data report information is complete and correct when that shown on the valve.

8. MOST INSPECTION OPERATIONS

8.1 Clean the valve by acetone wipe followed by demineralized water rinse to remove coolant.

8.2 Restore storage protection as required.

NOTE: Valves that were formerly stored in a container with liquid for items may require a separate container.

8.3 Complete the data report form and forward to the Mechanical Assistant Engineer for review and processing.

N. A.

N / A

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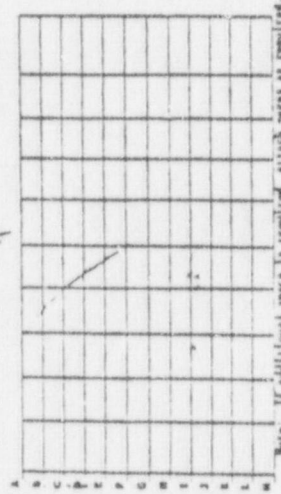
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IV. ESD 236-Figure 2 Data
Report

DATA REPORT - VALVE WALL THICKNESS
FIGURE 2

1. Valve Identification: Unit No. _____, MFR. _____
Location No. _____, Type _____
Remarks: (M/A, M/F, ETC.) _____
2. Test Equipment: MFR. _____ (Model) _____
S/N _____ MFR. _____
Frequency _____ MFR. _____
3. Calibration: Slip gauge material _____
Microscopic readings: A _____ B _____ C _____
D _____ E _____ F _____
G _____ H _____ I _____ J _____
K _____ L _____ M _____ N _____
O _____ P _____ Q _____ R _____
S _____ T _____ U _____ V _____
W _____ X _____ Y _____ Z _____
Calibration check taken prior to use? Mechanical _____
Performed by _____ Date: _____
4. Valve Body Insulation: (Water on Slip T.Y. for Grid Log only)



Note: If additional space is required, attach pages as required.

5. Measurement and Post Calibration by: _____
Actual slip thickness: A _____ B _____ C _____ D _____
E _____ F _____ G _____ H _____ I _____ J _____
K _____ L _____ M _____ N _____ O _____
P _____ Q _____ R _____ S _____ T _____
U _____ V _____ W _____ X _____ Y _____ Z _____
Microscopic readings: A _____ B _____ C _____
D _____ E _____ F _____ G _____ H _____ I _____
J _____ K _____ L _____ M _____ N _____ O _____
P _____ Q _____ R _____ S _____ T _____
U _____ V _____ W _____ X _____ Y _____ Z _____
Calibration check taken prior to use? Mechanical _____
Performed by _____ Date: _____

Unit No. of Microscope: _____
Date: _____

QUALITY AUDIT SUMMARY REPORT

AUDIT NO.: 101

FILE NO.: I

AUDIT DATE: 1-18-82

ACTIVITY AUDITED		DISTRIBUTION	
Organization		TITLE	NAME
APPLICABLE DOCUMENTS	PG&E 8833XR, 8711	VICE PRESIDENT QA	E.F. Gerwin
		DIRECTOR OF QA	A.A. Eck
10CFR50BL, KFP-1, KFP-16, KFP-2		RESIDENT CONSTR. MGR.	J. Ryan
PURPOSE OF AUDIT		SUPER. AREA AUDITED	H. Karner, R. King
		A.N.I.	R. Sanderson
Scheduled		FIELD QA/QC MANAGER	H. Karner
OTHER		V.P. MECH. CONSTR.	P.L. Evans
		PG&E	J. Arton

CODE	A.A.R. #	SUMMARY
		<u>ORGANIZATION I</u>
		This audit was conducted to determine if NDE Procedures were qualified and if the Field Organization Chart reflected the KFP-1 Organization Chart.
1	1	Twenty-one NDE Procedures were audited. Eleven NDE Procedures had "Procedure Qualification Records" located in the Master Job File. Three NDE Procedures were provided to Pullman by PG&E and the qualification records are maintained by PG&E. Two NDE Procedures are used to measure material thickness and do not require procedure qualification. Five NDE Procedures do not have evidence that the special processes are accomplished using qualified procedures or that qualification records were maintained to document and assure quality of material and work. * Per QA/QC Manager H. Karner, Mon 3/25/82
2	2	The Field QA/QC Organization Chart listed all job functions listed on the KFP-1 Organization Chart. The Field Chart does not have a Key explaining the reporting relationships between job functions. The Field Chart does not accurately show the reporting relationship of the QA Manager to the Resident Construction Manager and to the Director of Quality Assurance.
1	3	The Field Production/Engineering Organization Chart listed all job functions except one that was listed on the KFP-1 Organization Chart. The job function of "Material Cont." was not listed on the Field Chart. The Field Chart had a key explaining the reporting relationships between job functions but the Key is different from the KFP-1 Chart Key and does not include the same type information. The reporting relationships of Field Engineers (Rupture Restraint, Piping, Hangers and Snubbers) and the Buyer do not agree with the KFP-1 Chart.
2	3	

RESPONSIBLE CONTACT: H. KARNER TITLE: QA/QC MANAGER	PREPARED BY: H. HUDSON TITLE: INTERNAL AUDITOR	DATE: 1-19-82
--	---	---------------