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59-275/3230



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

July 13, 1984

DOCKETED
GENERAL

'84 JUL 16 A10:06

Dr. Sherman Naymark
President, Quadrex Corporation
1700 Dell Avenue
Campbell, California 95008

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

SERVED JUL 16 1984

Dear Dr. Naymark:

The Commission has received your letter of May 31, 1984 and we appreciate your willingness to meet with us on July 24, 1984 regarding the Nuclear Service Corporation audit of the Pullman Kellogg Company at Diablo Canyon in 1977.

As you know, we hope that a personal discussion with you will provide us with a better understanding of this issue. In order to facilitate discussion at our upcoming meeting, we are forwarding an informal list of questions (Enclosure) for your review and consideration. We hope you will be prepared to respond to these questions and related questions that may arise on this subject.

If you have any questions or comments regarding the proposed scope and format of this meeting, please contact the Commission's Secretary, Mr. Samuel J. Chilk, at (202) 634-1469 at your earliest convenience.

Thank you again for your assistance in this matter.

Sincerely,

Nunzio J. Palladino

Enclosure:
As stated

cc: Diablo Canyon Service List

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PDR ADDCK 05000275
PDR
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DS02

QUESTIONS FOR DR. NATHAN NAYMARK

1. We are particularly interested in any insight you can provide to us on the basis for the NSC conclusion (NSC Audit Finding 10a) that "There is no confidence that welding done prior to early 1974 was performed in accordance with welding specification requirements".

2. We would also appreciate your comments on the NRC contrary finding that, while isolated welding discrepancies were identified and corrected by Pullman, the aggregate of problem areas were not so pervasive as to support the NSC conclusion. The NRC efforts to assess the validity of NSC's audit findings are documented in Inspection Reports 50-275/83-34, 83-24, 83-37 and 83-25, see enclosures. You may also find it helpful to examine the NRC staff's review, performed by an independent contractor, of radiographs and other Pullman records related to quality assurance (enclosed as Attachment 1 to Inspection Report Numbers 50-275/83-37 and 83-25).

3. Can you explain why NSC audit finding 10a concluded that "Records of welder qualifications prior to 1972 are not available." An NRC inspection (50-275/83-37

and 83-25) determined that 20 welders were qualified between 8/4/71 and 12/23/71.

4. Given your knowledge of the procedures NSC had in place in 1977 to ensure quality products, do you still have confidence in the quality of the NSC audit report?
5. PG&E has indicated that they had expected NSC to audit the quality of hardware. Apparently NSC only audited paper work. Is there a discrepancy between what was requested and what was done and, if there is, will you explain the reasons for this discrepancy?
6. Were you at the exit interview at the conclusion of the NSC audit of Pullman? If you were, in what capacity were you there and what do you recall about that exit interview? Was it typical for you to attend exit interviews related to that kind of contact?
7. Have you had any interactions with PG&E in the last year regarding the NSC audit and, if you have, what was the nature of those interactions?

8. Please describe the nature of your efforts to resolve the conflicts between the NSC audit findings and the NRC inspections/audits regarding Pullman work.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V

1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

OCT 28 1983

Docket Nos. 50-275 and 50-323

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

Attention: Mr. J. O. Schuyler, Vice President
Nuclear Power Generation

Gentlemen:

Subject: NRC Inspection of Diablo Canyon Units Nos. 1 and 2

This refers to the special inspection conducted by Mr. G. H. Hernandez of this office on October 11-14, 1983, of activities authorized by NRC License No. DPR-76 and Construction Permit No. CPPR-69, and to the discussion of our findings held with Mr. Etzler and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

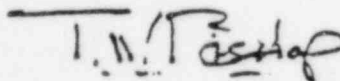
No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

OCT 28 1983

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,



T. W. Bishop, Director
Division of Resident, Reactor
Projects and Engineering Programs

Enclosure:

Inspection Report

Nos. 50-275/83-34

50-323/83-24

cc w/enclosure:

P. A. Crane, PG&E

W. A. Raymond, PG&E

S. M. Skidmore, PG&E

R. D. Etzler, PG&E

R. C. Thornberry, PG&E

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/83-34 and 50-323/83-24

Docket Nos. 50-275 and 50-323

License No. DPR-76

Construction Permit No. CPPR-69

Licensee: Pacific Gas and Electric Company

77 Beale Street, Room 1435

San Francisco, California 94106

Facility Name: Diablo Canyon Units 1 and 2

Inspection at: Diablo Canyon Site, San Luis Obispo County, California

Inspected conducted: October 11-14, 1983

Inspectors: *D. F. Kirsch*
for G. H. Hernandez, Reactor Inspector

10/26/83
Date Signed

Approved by: *D. F. Kirsch*
D. F. Kirsch, Chief
Reactor Projects Section No. 3

10/26/83
Date Signed

Summary:

Inspection During the Period of October 11-14, 1983 (NRC Inspection Report Nos. 50-275/83-34 and 50-323/83-24)

Areas Inspected: A special, unannounced inspection by a regional-based inspector to examine licensee and contractor actions in response to an audit conducted by Nuclear Services Corporation in August-September 1977 of Pullman Power Products construction activities. A copy of this audit was included in documents provided on September 9, 1983, to the Atomic and Safety Licensing Appeals Board by the "Joint Intervenors" to supplement their motion for re-opening the record on Construction Quality Assurance (CQA).

The inspection involved 22 inspection-hours by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Individuals Contacted

a. Pacific Gas and Electric Company (PG&E)

*R. D. Etzler, Field Construction Manager
D. A. Rockwell, Project Field Engineer
*W. K. Glenn, Quality Control Supervisor
*C. M. Seward, Acting Quality Assurance Supervisor
M. E. Leppke, Mechanical Engineer
*C. L. Eldridge, Operations Quality Control Supervisor
D. B. Miklush, Maintenance Manager
*J. Arnold, Resident Mechanical Engineer

b. Pullman Power Products Corporation (PPP)

*H. W. Karner, Quality Assurance/Quality Control Manager

*Denotes attendees at the NRC exit management meeting on October 14, 1983.

In addition, Mr. M. Eli (LLNL) and Mr. C. Morton (EG&G), NRC consultants, attended the exit management meeting.

2. Background

On September 9, 1983, the Joint Intervenors filed with the Atomic Safety and Licensing Appeals Board a document to supplement their pending motion to re-open the record on the issue of Construction Quality Assurance (CQA). The documents included (1) a proposal for an independent audit of Pullman Power Products (PPP) by Nuclear Services Corporation (NSC) and, (2) the results of a previous Nuclear Services Corporation audit. The NSC audit was conducted from August 22 - September 20, 1977, and covered Pullman's construction activities from 1971 through September 1977.

3. Region V Actions

The Joint Intervenors' motion and PG&E's response to the Joint Intervenors Supplement to Motion To Reopen The Record On Construction Quality Assurance was reviewed by the NRC Region V staff, and a staff response provided to the ASLAB on this subject on October 4, 1983. Based on the review of the aforementioned documents, discussions with licensee personnel and a review of NRC Region IV and Region V Inspection Reports during the referenced period, (1971 through September 1977) the staff concluded that the Pullman Quality Assurance Program did not suffer a major breakdown and for those instances where isolated breakdowns did occur, those problems were identified, addressed, and resolved by the licensee's Quality Assurance Program or the NRC inspection program in effect at the time.

The staff did not attempt to reconcile each and every NSC audit finding. Rather, the staff verified that the licensee made every effort to thoroughly address, investigate, and resolve each concern identified in the NSC audit. However, a review of the licensee's response indicated that three areas required further clarification to assure that the licensee's response to the NSC audit findings complied with regulatory and code requirements. These areas of concern are discussed below in paragraph 4 of this report.

4. Inspection Results

During this inspection the inspector met with licensee personnel who participated in the April - June 1978 licensee followup audit of Pullman Power Products. This audit was conducted as a direct result of the NSC audit findings and was performed to assure that Pullman's Quality Assurance Program and physical work complied with regulatory and contractual requirements in effect during the time the work was performed. The results of the licensee's and Pullman's response to the NSC audit findings were reviewed with the above referenced individuals. The review/discussions reaffirmed the earlier staff conclusion that the NSC audit findings had been properly addressed, and every effort had been made by the licensee to thoroughly address and resolve the NSC audit findings. The three areas of concern were resolved as follows:

- a. Criterion III, "Measuring and Test Equipment" finding No. 2 to the NSC audit states that, "The calibration program did not require recalibration of thermocouples until June 16, 1976. Therefore, there is no assurance of the accuracy of thermocouples used for pre- and post-welding heat treatment prior to June 16, 1976. Newly purchased thermocouples were required to be calibrated by the manufacturer. However, the manufacturer's calibration does not assure that the thermocouples have not been damaged during handling and shipping."

The Pullman response states, in part, that, "All thermocouples have been and are purchased with calibration. Prior to June, 1976, there were no requirements of recalibration to thermocouples. When the program was initiated, all existing thermocouples were recalibrated and none were found to be out of calibration."

The inspector reviewed thermocouple record packages and confirmed that the documentation supported the licensee response that thermocouples were purchased with calibration requirements, and that when all existing thermocouples were re-calibrated on June 15, 1976 and July 10, 1976 and that all were found within calibration requirements.

The inspector has no further questions on this subject.

- b. Criterion IX, "Special Processes" item 10.o (2) of the NSC audit finding states that, "Tempil sticks were not used."

The Pullman response states that, "In cases where welders were noted without Tempil Sticks in Internal Audit Findings, there was no indication on the "Welders Audit Sheet" that the interpass temperature was too high. It is, therefore, concluded that weld quality was not affected. Ferrite checks of welds where tempil sticks were not used show acceptable results."

This NSC audit finding may have been based on findings of previously conducted Pullman audits. The inspector interprets the NSC audit finding as implying that Tempil sticks were not used at all by Pullman welders. The Pullman response makes it clear that only for those cases identified by the Pullman auditor was there a question as to whether the welders audited were using Tempil sticks. The inspector found that Tempil sticks were used by Pullman welders as a matter practice during the period.

The inspector has no further questions on this subject.

- c. Criterion IX, "Special Processes", finding 10g of the NSC audit states that, "Welder BF (W. Adair, 251) performed welding on FW-70, 72, 73, 76, 77, 78, 100B, 132, and 133 in isometric package 21-7 and FW-88, 90, 92, 134, 135, and 160B in isometric package 21-8. This welder was not qualified for the thickness range; and the welds were reported on DR's 2536, 2538, 2539, and 2899. In accordance with Pacific Gas & Electric Company disposition, some of the welds were radiographed and found acceptable; welder BF was qualified to the thickness range; and all the welds in question were accepted. This disposition is not permitted by B31.1, B31.7, and ASME Section IX, which all specify that the welder must be qualified prior to making production welds."

The Pullman response states:

The deviation cited was found by Pullman Quality Assurance and reported to PG&E on appropriate deviation records. Reference to DR-2536 is incorrect.

The auditor is completely incorrect in indicating that ASME Section IX, B31.1 and B31.7 do not permit welding prior to qualification. No such prohibitions exist.

DR-2538 Revision 1 and DR-2539, Revision 1 dated July, 1975 report 2-2" butt welds in Diesel Fuel Oil (160B and 100B) made 12/17/73. Welder was not qualified for small diameter (3" and under) until 2/28/74.

Both DR's use the option to qualify the welder by radiography (see 1971 Section IX Winter 71 Addendum - Paragraph Q2(a)). Both production welds (160B and 100B) were radiographed and found acceptable. PG&E accepted qualification on this basis.

DR-2899 dated August, 1975 reported 14 butt welds made prior to 2/18/74. Investigation shows these were 2 1/2" pipe size. Prior qualification by DR-2538 Revision 1 and DR-2539 Revision 1 covers qualification of these seams. No further NDE required..."

The inspector questioned the response to the finding because the code does not allow a welder to perform production welding prior to qualification to the particular process. The inspector considered that to adequately resolve this finding the licensee should have radiographed the other fourteen welds in question. Investigation into this item determined that during the 1978 HOSGRI modifications the diesel oil fuel piping was re-routed. During the re-routing process, the two piping runs containing fifteen of the sixteen welds in question were eliminated. The only currently installed weld (Weld No. 160B) was one of the two welds originally radiographed by the licensee to justify the acceptance of the other fourteen welds. The radiographs for weld 160B were reviewed and found acceptable. Additionally, the inspector noted that the original NSC audit finding came from a Pullman internal audit that originally identified the discrepancy. Therefore, it is apparent that the Pullman Quality Assurance Program was in effect and was actively identifying problems in Pullman's welding program.

The inspector has no further questions on this subject.

5. Management Meeting

On October 14, 1983, the inspector met with licensee representatives denoted in paragraph 1. The inspection scope, observations, and findings were discussed.

FEB 29 1984

Docket Nos. 50-275 and 50-323

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

Attention: Mr. J. O. Schuyler, Vice President
Nuclear Power Generation

Gentlemen:

Subject: NRC Inspection of Diablo Canyon Units Nos. 1 and 2

This refers to the special inspection conducted by Messrs. D. F. Kirsch, T. M. Ross, and G. H. Hernandez of this office on November 14-18 and November 28 - December 9, 1983, of activities authorized by NRC License No. DPR-76 and Construction Permit No. CPPB-69, and to the discussion of our findings held with Mr. D. A. Rockwell and other members of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A.

Your response to this Notice is to be submitted in accordance with the provisions of 10 CFR 2.201 as stated in Appendix A, Notice of Violation.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

- Sincerely,

Original signed

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

Enclosures:

- A. Notice of Violation
- B. Inspection Report
Nos. 50-275/83-37 and 50-323/83-25 with Attachment 1

cc w/enclosures:

- P. A. Crane, PG&E
- W. A. Raymond, PG&E
- S. M. Skidmore, PG&E
- R. D. Etzler, PG&E (Diablo Canyon)
- R. C. Thornberry, PG&E (Diablo Canyon)

bcc:

- RSB/Document Control Desk (RIDS)
- State of CA
- Resident Inspectors
- Mr. Martin
- pink/green/docket file copies
- Sandra Silver (report only)

RV

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APPENDIX A

NOTICE OF VIOLATION

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

Docket No. 50-275
License No. DPR-76
Docket No. 50-323
Construction Permit No. CPPR-69

As a result of the inspection conducted on November 14-18 and November 28 - December 9, 1983, and in accordance with NRC Enforcement Policy, 10 CFR Part 2, Appendix C, the following violation was identified:

Section 17.1.5 of the FSAR (dated October 1978) and the Pacific Gas and Electric Company Quality Assurance Manual Section V (dated August 15, 1978) states, in part, that, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings...and shall be accomplished in accordance with these instructions, procedures, or drawings...."

Engineering Standard Diablo (ESD) No. 237, "Quality Assurance Inspector Training Program," dated February 26, 1974, states in paragraph 2.3 that, "All personnel engaged as Field QA Inspectors involved in the inspection of weldments, interpretation of Engineering Specifications and Welding Procedures, and documentation work, shall be required to complete an indoctrination period as described in Section 4 of this specification." Paragraph 4.1 states that, "The indoctrination period for the Field Q.A. Inspectors described in Section 2.3 shall contain as a minimum, but not necessarily limited to, the following courses:

Visual Inspection	Welding Procedures
Welding Inspection	Welding Processes
Basic Q.A.	

Other courses offered as optional are:

Welding	Steam Power Plant Fundamentals
Basic Power Plant Instruction	Welding & Piping Engineer. Technology
Introducing Nuclear Power	(I.C.S.)

The Visual Inspection and Welding Inspection tests shall be administered and controlled by the N.D.E. Training Officer. All N.D.T. training, qualifications and certifications will be covered by ESD-235."

Paragraph 4.2 states that, "Tests used for the indoctrination courses for Field Q. A. Inspectors shall be:

1. For Basic Q.A. Test-ESD's.
2. For Weld Procedure Test-Approved Welding Procedures.
3. For the Weld Process Test, Welder Qualification Card and Pipefitter's Manual.
4. For Welding Inspection Qualifications, General Welding Information.
5. Visual Inspection Qualifications-General Dynamics NDT Introduction."

A Nuclear Services Corporation (NSC) Audit dated October 27, 1977, identified in Criterion IX, Finding No. 3 (of the audit) twenty-eight individuals which were alleged to have begun performing their duties without fulfilling the Pullman Power Products procedural requirements for certification and qualification of Quality Assurance (Welding) Inspectors.

Contrary to the above requirements of the FSAR and Pullman procedures, the inspector identified on November 15, 1983 that in virtually all cases the individuals hired after September 25, 1973, named in the NSC audit finding (who were assigned to perform welding inspections), began inspecting and accepting weldments, before completing the required training, taking the required examinations, and before being certified as a welding inspector. It is noted that the Pullman Power Products response to this Nuclear Services Corporation finding states, in part that, "All current inspectors have been qualified by test as outlined in ESD-237. The requirement for qualification and certification of field inspector were added in ESD-237 on September 25, 1973 to reflect the requirements of ANSI N45.2.6, just published. Persons hired before this time were not necessarily tested at time of hire. Subsequent to 1973, the records indicate that all inspection personnel received required training and examination." However, the Pullman response is silent with regards to inspectors performing inspections prior to certification.

This is a Severity Level IV Violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, Pacific Gas and Electric Company is hereby required to submit to this office within thirty days of the date of this notice a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

2/29/84
Date

H. L. Canter
H. L. Canter, Chief
Reactor Projects Section No. 3

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/83-37 and 50-323/83-25

Docket Nos. 50-275 and 50-323

License No. DPR-76 and Construction Permit No. CPPE-69

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

Facility Name: Diablo Canyon Units 1 and 2

Inspection at: Diablo Canyon Site, San Luis Obispo County, California

Inspection conducted: November 14-18 and November 28 - December 9, 1983

Inspectors:

G. H. Hernandez
G. H. Hernandez, Reactor Inspector

2/29/84
Date Signed

T. M. Ross
T. M. Ross, Reactor Inspector

2/29/84
Date Signed

D. F. Kirsch
D. F. Kirsch, Chief, Reactor Safety Branch

2/29/84
Date Signed

Approved by:

H. L. Canter
H. L. Canter, Chief
Reactor Projects Section No. 3

2/29/84
Date Signed

Inspection During the Period of November 14-18 and November 28 - December 9, 1983 (NRC Inspection Report Nos. 50-275/83-37 and 50-323/83-25).

Areas Inspected: A special, unannounced inspection by regional-based inspectors to perform an in-depth review of selected findings contained in an audit of the Pullman Power Products Quality Assurance Program conducted by Nuclear Services Corporation (NSC), during August - September 1977. Concurrently, the licensee and contractor responses were evaluated to establish whether the outstanding issues identified by NSC were resolved or corrected.

The inspection involved 402 inspection-hours by three NRC inspectors.

Results: Of the areas examined one item of noncompliance was identified (failure to assure that welding inspectors are qualified and certified in accordance with procedural requirements, paragraph No. 17).

DETAILS

1. Individuals Contacted

a. Pacific Gas and Electric Company (PG&E)

- R. D. Etzler, Project Superintendent
- *D. A. Rockwell, Project Field Engineer
- *M. E. Leppke, Onsite Project Engineer
- *C. L. Eldridge, Quality Control Manager (Nuclear Operations)
- *W. K. Glenn, Quality Control Supervisor
- *T. E. Pierce, Quality Control Engineer
- *M. N. Norem, Lead Startup Engineer
- *J. Arnold, Resident Mechanical Engineer
- *R. Taylor, Quality Assurance Engineer

b. Pullman Power Products Corporation (PPP)

- *H. W. Karner, Quality Assurance/Quality Control Manager
- *F. J. Lyautey, Assistant Quality Assurance/Quality Control Manager
- *J. Guyler, Internal Auditor

* Denotes attendees at the NRC exit management meeting on November 18, 1983.

No NRC Management Meeting was held with the licensee at the conclusion of the NRC inspection which ended on December 9, 1983.

In addition, Mr. M. M. Mendonca, the NRC Senior Resident Inspector, and Mr. T. Polich, NRC Reactor Inspector, were present at the exit management meeting.

2. Introduction:

The Nuclear Regulatory Commission (NRC) staff performed an unannounced in-depth inspection to review the validity of the NSC audit findings and evaluate the adequacy of the Pullman and PG&E responses to the NSC audit findings.

Licensee and contractor actions in response to the NSC audit findings had been previously reviewed by the staff. Inspection Report 50-275/83-34 documented this inspection and concluded that problems identified in the NSC audit were properly addressed and resolved by the licensee's Quality Assurance Program. This previous inspection did not include an in-depth review of each and every NSC audit finding; but instead evaluated the results of the licensee's and PPP's response and specifically addressed three particular NSC findings that required further clarification. Based upon Inspection Report 83-34 and other reviews conducted by the NRC inspection program, the staff (in October 1983) provided an affidavit to the Atomic Safety and Licensing Appeal Board concluding that the PPP Quality Assurance Program did not suffer major breakdowns which could have significant adverse impact on construction activities.

The staff inspection effort documented in this report represents a much more in-depth examination of specific NSC audit findings and their impact on PPP construction quality assurance.

3. Purpose:

The goal of this inspection effort was threefold:

- (a) To assess whether the NSC audit findings represented a major defect in the Pullman or PG&E management of quality programs.
- (b) To establish an additional level of assurance that Pullman Power Products and the licensee's responses to the NSC audit findings were accurate, appropriate, and effective in resolving all issues pertinent to compliance with codes and regulations.
- (c) To assess any NSC audit findings which appeared to identify noncompliance with accepted standards, codes and regulations.

4. Scope of Inspection Plan:

The NRC inspection effort involved a review of all NSC audit findings listed in the NSC report issued October 24, 1977. In conjunction, a face value assessment was performed to assess the adequacy and completeness of the responses provided by Pullman Power Products and the licensee (dated April 11, 1978 and June 16, 1978, respectively) to each of the NSC findings. A selection of the more significant NSC audit findings was generated by the NRC. These selected items formed the basis for the NRC's on-site examinations.

The NSC audit identified 175 total findings. The staff considered that 110 of these audit findings could be interpreted as apparent deficiencies. The NRC had previously examined three of the NSC audit findings. Those findings are documented in NRC Inspection Report 50-275/83-34. Of the 110 apparent deficiencies, the NRC staff selected 47 of the most significant items, giving priority to those findings which could reasonably impact upon construction quality. Thus, about 45% of the NSC identified deficiencies were examined in an in-depth manner by the staff. (This examination represents about 70% of the principal deficiencies cited by the Joint Intervenors in their supplementary motion to reopen the record on construction quality assurance based upon the results of the NSC audit).

Those NSC findings selected as high priority topics for the NRC inspection were based on the following rationale:

- (a) Audit findings which appeared to have the greatest potential for manifestation in poor quality work in the field.
- (b) Audit findings which specifically reference characteristics of poor field work practice.
- (c) Those findings that appear to be in noncompliance with accepted standards, codes and regulations.

Where the NSC findings involved a potential for disputes over NDE results, the NRC contracted with an independent consultant to examine the field work and records for compliance with code requirements. To establish whether adequate control over weld delta ferrite content had been implemented in the shop and field, a sample of twenty-five stainless steel welds was chosen and examined for delta ferrite content. These welds was chosen from small bore piping which contain both field and shop welds. To establish whether inking of numbers onto radiographs was a wide-spread practice or if the NSC finding represented an isolated instance, 102 field weld radiographs were selected to verify field weld and radiographic interpretation adequacy. The 102 welds examined were selected from several of the more important safety systems; including the Reactor Coolant System (system 7), safety injection system (system 9), containment spray system (system 12), main steam system (system 4), chemical and volume control system (system 8) and residual heat removal system (system 10). In addition, four specific welds, from among those identified in the NSC findings, were examined to establish whether the surface preparation was acceptable for nondestructive examination. Liquid penetrant testing of these four field welds was performed to ascertain the degree of actual compliance with acceptance standards. The above items were selected to provide an independent feel of the Pullman work, rather than solely relying on information provided by licensee records.

The NRC also reviewed the non-conformance reports (NCR's) and minor variation reports (MVR's) issued by the licensee as a result of an audit, conducted by the PG&E Q.A. department, of the PPP Q.A. program, issued June 13, 1978. Corrective actions identified by these NCRs and MVRs were evaluated for adequacy and implementation, and appeared acceptable.

The NSC Audit Findings selected by the NRC for in-depth examination and the NRC findings are detailed in the following paragraphs.

5. Criterion I, NSC Audit Finding No. 3:

"The field Quality Assurance Organization has performed functions other than those described in KFP-1 and KFPS-1; and some functions were outside the quality responsibility, i.e., writing and approving Engineering Specifications, performing welding engineering functions, approving engineering changes. These activities raise the question of the qualification of Quality Assurance personnel to perform these functions and the problem of requiring the Field Quality Assurance Organization to audit its own performance."

NRC Finding:

To resolve this issue the inspector's approach was to establish who in the Pullman organization was allowed to write procedures or procedure changes, perform the review and approval process for such documents and whether sufficient control was exercised by Pullman in the writing, review and approval process. In addition, the validity of the Pullman response was assessed.

The quality assurance program prescribed by the Pullman ASME Quality Assurance Manual procedure KFP-1, and as implemented in part by procedure ESD 269, apparently allows anyone to be assigned the task of writing procedures. However, the point of control in this procedure writing process is that the cognizant discipline management is required to review and approve the procedure prior to issuance for use. For example, the Pullman Chief Field Engineer is required to review and approve engineering and construction procedures to assure compliance with code, specification and contract requirements and the Quality Assurance Manager is required to review and approve quality assurance implementing procedures. In addition, engineering specifications covering quality assurance functions are required to be reviewed and approved by the contractor's Quality Assurance Manager and the licensee. Engineering specifications may provide instructions to field Quality Assurance inspectors, field engineers and foremen. One exception to this is that welding procedures to be used onsite were, and are, required to be qualified by the Welding Engineer at the Pullman home office, approved and issued by that office, and approved by the licensee's engineering. Engineering Specifications must also be approved by the licensee.

While the inspector concludes that adequate controls were applied in the procedure review and approval process to assure procedure adequacy, a stated concern was whether QA would be involved in auditing for adequacy a procedure which QA authored, thus potentially auditing their own performance. Quality Assurance normally audits to assure that the QA program requirements are properly implemented by quality effecting procedures and to assure that contract specification and code requirements are adequately implemented in the field. The inspector further concludes that while QA and QC may audit or inspect for implementation of these procedures such action is not considered to be an auditing of their own performance because program implementation is the responsibility of production oriented organizations.

The inspector concludes that there is no regulatory or procedural requirements which provide limits as to whom may write procedures. The inspector further concludes that Pullman has provided adequate controls to assure procedures are reviewed and approved by appropriate discipline and managerial authority prior to issuance and use of a new procedure.

No items of noncompliance or deviations were identified.

6. Criterion II, NSC Audit Finding No. 4

"There is no evidence that upper management has performed scheduled reviews of nonconformance reports, personnel qualifications, and corrective actions."

NRC Finding:

The inspector examined the historical records of nine corporate management audits conducted between September 1972 and June 1977. This examination verified that nonconformances, personnel qualifications, and corrective action were consistently among those activities audited by corporate management.

In addition, Pullman Power Products has since provided programmatic improvements and incorporated an on-site management review system requiring that the Quality Assurance/Quality Control Manager submit monthly reports "Summarizing all significant Quality Assurance events, audits, nonconformances including trends noted, and may offer suggestions for Q. A. program improvement."

The inspector concludes the historical records of corporate management audits do provide evidence that reviews of nonconformance reports, personnel qualifications and corrective actions were performed.

No items of noncompliance or deviations were identified.

7. Criterion V, NSC Audit Finding No. 1:

"There is no requirement that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings."

NRC Finding:

The inspector determined that Section KFP-8 (revision dated August 22, 1972) of the Pullman Quality Assurance Manual contains procedures to be used to establish "Process Planning and Control" for on-site work. Specifically KFP-8, in paragraph 8.1, requires that "The field process sheet (Figure No. 11) serves as a traveler to identify, in sequence, the field work to be done. It is used both for the field fabrication of piping assemblies and for the erection of pipe in the plant." A field process sheet will list in sequence all significant operations and inspections associated with a particular field activity. Specific written procedures are required to be referenced, for each operation and inspection listed, to identify those detailed instructions necessary to actually perform the work assignments. Applicable isometric or detailed drawings and code requirements are also indicated on the field process sheet. Procedure KFPS-7 (issued December 3, 1973), of the Quality Assurance Procedures for Pipe Supports, establishes a similar "Process Planning and Control" system using the Field Support Process Sheet.

The inspector concludes the program elements of KFP-8 and KFPS-7 did establish that documented instructions and procedures were required to be prescribed for control of Pullman's quality related construction activities.

No items of noncompliance or deviations were identified.

8. Criterion V, NSC Audit Finding No. 2:

"Many activities affecting quality are not described in procedures. Among those activities are: hanger package review, pre-heating for welding, use of Note-O-Grams, use of Rejection Notices, and maintenance of Field Quality Inspector Daily Logs."

NRC Finding:

The inspector examined the procedures and program instructions that were available for the specific activities identified.

The inspector determined that hanger package review is described in KFPS-12 (dated December 3, 1973), which is concerned with the final documentation of pipe supports. KFPS-12 requires that "all field fabricated and field installed supports have been inspected, and accepted drawings are compiled and indexed as outlined" by the inclusive program instructions. Supplementary requirements were subsequently incorporated into ESD-254 (dated December 30, 1977) in the form of a document review checklist to establish a "Guide for assembly and review of hanger documentation packages."

Preheating for welding is prescribed in the applicable Pullman "code weld procedure specifications," which are specifically referenced by the field process sheet. Later revisions of the field process sheet and ESD-218 (dated October 1977) included amplification of preheat temperature range requirements.

The inspector does not consider it necessary that documents such as Note-O-Grams, Rejection Notices, and Inspector Logs be controlled and prescribed by written procedures. These documents are implemented internally as an aid to the quality assurance program management and provide administrative tools for status reporting and recording. The inspector determined that these documents do not establish requirements, procedural instructions, or final acceptance documentation for quality related activities. Pullman's Quality Assurance Program delineates those procedures required to be used for the inspection and documentation of quality related activities.

In conclusion, the inspector found the Q.A. program elements describing hanger package review and weld preheat were adequate and met the applicable code requirements. Note-O-Grams, Rejection Notices and Inspector Logs are not required, by applicable codes, to be prescribed in procedures. The Pullman and PG&E responses were consistent with these conclusions.

No items of noncompliance or deviations were identified.

9. Criterion V, NSC Audit Finding No. 3:

"Many activities affecting quality are insufficiently described in procedures. Among these activities are isometric package review, post welding heat treatment, non-conformance reporting, ninety-day welder's log and weekly qualified welder's list, and auditing."

NRC Finding:

The inspector examined Pullman's Quality Assurance Program to determine if the specific activities identified in the NSC Audit Finding were adequately and sufficiently described. The inspector's findings are as follows:

- Field procedure ESD-254 (dated May 6, 1975) appears to provide an adequate outline guide for review of isometric drawing packages. May 6, 1975 was the earliest date that could be found for ESD-254. While most piping installations had been completed prior to May 1975, the inspector found that the final complete document review of isometric drawing packages were performed after ESD-254 was in effect.
- Appropriate post weld heat treatment requirements were always prescribed by weld procedure specifications. These were further amplified in ESD-218 (October 1977), as a program improvement subsequent to the NSC audit.
- Nonconformance reporting requirements prescribed by the Pullman ASME certified Quality Assurance Program Manual Section KFP-10 (dated January 4, 1973) and procedure ESD-240 (dated December 6, 1973) were consistent with Appendix B criteria. A significant rewrite of ESD-240 in 1978, and subsequent revisions, established additional detailed instructions to clarify nonconformance reporting aspects such as documentation, specific personnel responsibilities, the functional use, closing-out, and 10 CFR 21 applicability. Pullman Power Products calls their nonconformance reports Discrepancy Reports, the terms are synonymous.
- Ninety-Day Welder's Log and Weekly Qualified Welder Lists are only referenced, by KFP-15 (dated August 22, 1972) and ESD-216 (dated June 17, 1976), to figures appended in the procedures. Although desirable, there were no amplifying descriptions on these forms to specify personnel responsibility, functional use, implementation, scope, etc., until significant revisions were incorporated into ESD-216 (dated July 10, 1979). These documents were used to maintain welder qualification status and were maintained by experienced personnel under the cognizance of the Quality Assurance/Quality Control Manager. A review of the application of 90-day welder logs and weekly qualified welder lists did not identify any evidence of inconsistencies that would have adversely affected quality control activities. The Code merely requires that a contractor assure that welders are qualified but doesn't prescribe methods effecting administrative control of this activity. Thus, the inspector finds that Pullman did adequately track welder qualification to assure Code compliance. This subject is further examined in paragraph 21 of this report.
- Internal and Corporate Management audits of the Pullman onsite Q.A. program were described by Q.A. manual section KFP-18 (revision 8/22/72). The program elements prescribed by KFP-18 were not complete and very general in nature. Those areas which appeared particularly deficient were audit personnel qualifications, audit scope, audit scheduling and disposition of audit records.

A corporate procedure (no. XVIII-1) prescribed further instructions for corporate management audits, directed and conducted by Williamsport headquarters management personnel. Corporate audit procedure No. XVIII-1, provided the detailed instructions for

conducting the management audits required by KFP-18. A review of corporate management audits, performed in accordance with Procedure XVIII-1, reveals a history of Quality Assurance Program audits based upon checklists following 10 CFR 50 Appendix B criteria. This established a comprehensive corporate audit system which appeared to review all field Q.A. program facets. Thus, for performing corporate management audits, Procedure XVIII-1 did provide effective amplifying instructions to implement the general elements of KFP-18.

There did not exist any comparable detailed procedure to implement "internal" audits required to be performed by on-site Quality Assurance personnel. A staff review of internal audit records prior to the NSC audit indicates that all aspects of the Pullman field Quality Assurance program were not being addressed. This deficiency was also clearly identified by a licensee audit of Pullman and subsequently documented on nonconformance report No. DCO-78-RM-004 (dated October 1978). Pullman's resolution included a rewrite of KFP-18 and development of an internal audit procedure, issued as ESD-263, dated June 26, 1978. To further provide for audit program consistency, the corporate audit procedure XVIII-1 was incorporated into field procedure ESD-274, dated February 19, 1980. Adequate corrective action was implemented to assure that all Q. A. field program elements were scheduled for internal auditing (as of June 1978). Records of subsequent internal and corporate audits verify that no major breakdown of the Quality Assurance program had occurred, nor had any significant problems gone undetected, due to the deficiencies identified with the internal auditing program.

In conclusion, the inspector determined there were adequate controls which prescribed requirements for isometric package review, post welding heat treatment and nonconformance reporting. Further, the practices used by Pullman in implementing the ninety-day welders log and weekly qualified welders list effectively accomplished the intent of these activities even though specifics regarding how these activities were to be performed were not prescribed in detail by procedures until July 10, 1979. Even though the internal audit program, implemented by on-site personnel, (prior to 1978) was determined to be of a marginal quality, a redundant program of comprehensive corporate audits was performed concurrently. Based upon an examination of the findings identified in corporate and internal audits, there did not appear to be any adverse impact on quality related activities as a result of the inadequate description of the internal auditing program. The inspector concludes that, with both programs operating simultaneously, sufficient records are available to assure the necessary criteria of Appendix B were being audited periodically. This conclusion is based, in part, on the absence of recurring significant audit findings.

No items of noncompliance or deviations were identified.

10. Criterion VI, NSC Audit Finding No. 9a:

"For Isometric 2-14-77: The Process Sheet was changed to show the completion of FW-192 on April 10 and April 11, 1974, approximately 19 months after the work was done."

NRC Finding:

The inspector found that even though the NSC audit finding identifies the incorrect isometric package, presumably due to typographical error, the Pullman response correctly addresses the intended isometric package, i.e., Isometric Package No. 2-14-47. Examination of isometric package no. 2-14-47 indicated that FW-192 was completed on April 11, 1974, as indicated by the signing and dating of the line item by the Pullman welding inspector. The signature and date were in ink and the inspector could not find any evidence to indicate that the completion date or signature had been altered or that any attempt had been made to alter the signature and date. The weld was liquid penetrant examined on December 2, 1975, found acceptable, and the line item for the non-destructive examination on the process sheet was then signed and dated. Examination of the Liquid Penetrant Examination record indicated that both the signatures and dates on the process sheet and the Liquid Penetrant Examination Record were in ink and no evidence could be found to indicate that there had been an attempt to alter the dates or signatures on either or both of these documents.

Therefore, the inspector could not corroborate the NSC auditor's finding that the date for completion of FW-192 had been changed or backdated.

No items of noncompliance or deviations were identified.

11. Criterion VI, NSC Audit Finding No. 9b:

"Isometric 2-14-8: FW-1673 was performed to Revision 2 of the isometric, which did not show FW-1673. Revision 3 of the isometric, which included the FW-1673, was generated approximately one week after completion of the weld. It is therefore concluded that FW-1673 was performed without the normal controls of a Process Sheet, a weld procedure call out and a call-out of NDE requirements."

NRC Finding:

The inspector examined the various contractor procedures and documents that existed during the time frame in question to determine whether the design change control system was circumvented by the Pullman Quality Assurance Inspector which allowed or directed the welding of a valve to a capped pipe. The inspector examined Isometric No. 2-14-8 which in Revision 2, dated December 11, 1972, shows a capped pipe (termed a nipple) and in Revision 3, dated May 29, 1974, the required valve and vent (actually a capped pipe) are depicted. Revision 2 of the isometric drawing did not show FW-1673. A review of the weld process sheet indicated that the weld (FW-1673) was completed on May 24, 1974, five days before the issuance of revision 3 to the isometric drawing. Thus, the inspector concludes that FW-1673 was made prior to the issuance of revision 3 to the isometric drawing. However, it appears that the installation of FW-1673 was accomplished in a controlled manner as described below.

The inspector examined Pullman Quality Assurance Instruction No. 52, dated December 13, 1973 which states that, "Due to a shortage of valves

used for vents and drains at this complex, it has become necessary to install twelve inch nipples, capped on end, to facilitate flushing." Subsequent to instruction no. 52, on March 8, 1974 an apparently generic discrepancy report (Discrepancy Report No. DR 2100) was written in an effort to expedite the installation of vents and drains in erected pipe. Item No. 3 of the approved disposition of the discrepancy report states that, "All welds added for this change will be recorded on the process sheet and isometric. All added weld number selection will be coordinated between drafting, Quality Assurance Inspector, and Engineering." Item No. 4 states that, "Engineering is to notify the area Quality Assurance Inspector prior to starting installation of standard vents and drains." Therefore, it appears that the Quality Assurance Inspector was in contact with Engineering for the installation of vents and drains and welds were required to be recorded on process sheets. Thus, the inspector concludes that the licensee and Pullman adequately controlled and documented the installation of nipples, in place of the required vents and drains. Furthermore, the inspector concludes that the licensee and Pullman adequately controlled the restoration of the system to design configuration by adding the required vents and drains when valves became available.

A process sheet for field weld, FW-1673 is contained in Isometric No. 2-14-8, as required. Therefore, the inspector concludes that FW-1673 was performed using the normal controls of a process sheet.

Further, Pullman procedure ESD-239, dated April 2, 1974, states in paragraph 2.1 that "Piping systems shall be closed out by Quality Assurance Inspectors. Piping shall be checked when necessary against PG&E area drawings, Section 3 of Specification 8711 and the PG&E flow diagrams. All missing or incorrect items shall be recorded on a punch list and D.R. (discrepancy report) written if required." ESD-239 further states in paragraph 3.1 that "The following is a guide for Quality Assurance Inspectors when closing out piping systems" and proceeds to state in paragraph 3.1.2 to "Check field run pipe and fittings for correct materials, rating and specifications when so identified," and in paragraph 3.1.15 to, "Check that instrument connections, vents, drains and plugs are installed per the Isometric and Flow Sheets." Therefore, it appears that Quality Assurance Inspectors were required to verify conformance to PG&E design drawing (Flow Sheets), and to record any discrepancies. The field QC inspector, in conjunction with Pullman Engineering, had apparently accepted the installation of FW-1673 knowing that the next isometric revision would be updated to correspond to Flow Sheet requirements.

A comparison of the contractor operated Isometric No. 2-14-8 to the PG&E Flow Sheet (PG&E Drawing No. 108014) indicated that the required valve and vent were depicted on the line referenced on Isometric No. 2-14-8. Therefore, the weld (FW-1673) attaching the valve and vent was, at least implicitly, required on the PG&E Flow Sheet (No. 108014). It appears that the valve and vent were not installed on the line due to the shortage of valves, as stated in the aforementioned Quality Assurance Instruction No. 52. However, adequate provisions had been made for the subsequent installation of the valve, as shown by the installation of the nipple and cap depicted in Revision 2 of the isometric. A check of one

other line with a similar configuration (there are four similar lines with valves and vents in the same area) confirmed that a similar situation had occurred for Isometric No. 2-14-6, Line No. 1759-6 (i.e., the weld had been made and completed before the revision to the isometric depicted the weld).

Additionally, the inspector verified that, in the time frame in question, a method existed to assure that the proper welding procedure was used for the pipe to valve weld in question. The inspector found that ESD-227, dated December 20, 1973 provided a chart indicating the proper weld procedure for different materials and configurations required. For this case, a socket weld was required and weld procedure no. 92/93 was the weld procedure needed and used. A review of the process sheet for FW-1673 confirmed that weld procedure 92/93 was used.

Finally, the inspector verified that contractor originated drawings (for example, isometric drawings) are reviewed by the Engineer (PG&E) for conformance with the PG&E design drawings. The PG&E Drawing Control Procedure, dated September 11, 1972, paragraph 3.11 (Contractor's Field Drawings and Procedures) states that "Drawings that are drawn by the contractors onsite (Lift drawings, piping isometric, hanger drawing, etc.) are submitted to PG&E onsite office for approval. These drawings are checked by PG&E drawings. They are returned to the contractor with the stamp (no. 6) below noting the appropriate condition of the drawing." Isometric No. 2-14-8 was stamped as approved, therefore indicating review and acceptance by the licensee.

In conclusion, it appears that under certain conditions welds could be added (through coordination with the Quality Assurance Inspector and the Engineer) which did not circumvent the then existing design change control system. Furthermore, these additions were accomplished in a controlled, orderly and proper manner.

FW-1673 was completed using a weld process sheet, a welding procedure was specified, including identification of necessary nondestructive examinations. Further, while FW-1673 was not depicted on the contractor generated isometric drawing, revision 2, the weld was implied to be necessary by the PG&E generated and approved Flow Sheet (Drawing No. 108014) and the inclusion of FW-1673 was accomplished and documented in a controlled manner.

No items of noncompliance or deviations were identified.

12. Criterion VI, NSC Audit Finding No. 9c:

"Isometric 2-14-53: FW-247 was completed on February 20, 1975. Approximately December 1, 1975, the visual acceptance was signed off and backdated; the Weld Rod Requisition was changed to show that more than the original quantity of one had been burned."

NRC Finding:

The inspector examined the daily work log of the Pullman inspector who performed the inspection on FW-247. The daily work log records indicate

that the inspector did perform the final inspection of FW-247 on February 20, 1975, as stated in the Pullman response. Therefore, the inspector does not consider this to be an unauthorized, or improper, backdating because the signature reflects the actual conduct of inspections.

Examination of the Weld Rod Requisition records indicated that the quantity of weld rod was changed on one weld rod slip as stated by the NSC auditor, however the change was initialed by a Pullman inspector. The change to the Weld Rod Requisition slip was apparently made because the Pullman inspector entered the number of weld rod returned on the wrong line item and subsequently changed the line item to reflect the correct conditions. It appears that the condition was caused by an error, which was later caught by the Pullman inspectors. The inspector considers this acceptable in that the record was apparently modified to reflect the actual conditions existing. NRC examination of approximately one hundred weld rod requisition records contained in isometric packages Nos. 2-14-77, 2-14-47, 2-14-8, 2-14-53, 2-14-59, and 2-26-417, did not identify any similar conditions.

The inspector concludes that this item does not represent an instance of unauthorized changing of quality related documents and that the changes made had been made with adequate basis and reason.

As a side issue, it was reported (in Pullman's response to this audit finding) that this problem had been found as a result of an internal Pullman audit. The inspector reviewed Pullman's internal audits and could not verify the Pullman audit response. It appears that the discrepancy was found by Pullman as a result of the documentation review of the isometric package. This minor inconsistency in the Pullman response is not considered to be significant.

No items of noncompliance or deviations were identified.

13. Criterion VI, NSC Audit Finding No. 9d:

"Isometric 2-14-59: FW-268 was completed February 5, 1975. On December 2, 1975, the entry on the Process Sheet for removal of dams was signed off and backdated. There is no proof that the dams had been removed."

NRC Finding:

The inspector found that FW-268 is a Code Class 3 weld which the records indicate was made with the use of a backing ring, thus, no dams were to be used. The signing on the line entry for dam removal, by the Pullman inspector, appeared to be an oversight on the part of the Pullman inspector. Examination of Isometric Package No. 2-14-59 indicated that a Warehouse Requisition Record specifying a backing ring for FW-268 was contained in the package. The inspector could not verify the December 2, 1975 date, when supposedly the backdating occurred.

The inspector did find that, apparently in response to the NSC finding, the Pullman inspector did cross out the "Remove Dam" entry, wrote "not applicable", dated and signed this line entry on December 7, 1977. This same Pullman inspector also found that he had performed the same error on

FW-269, which is contained on the same isometric package. The Pullman inspector then crossed out, wrote "not applicable", and dated and signed this line entry on December 7, 1977.

Examination of five isometric packages, by the NRC inspector, identified three other similar cases wherein a different Pullman inspector had signed the "Remove Dam" line entry, when in fact a backing ring had been used. Isometric package no. 2-14-53 contains FW-246 and FW-247 and Isometric package no. 2-14-47 contains FW-196, which have similar discrepancies.

The inspector concludes that no safety significance can be attributed to this NSC finding and no purpose would be served by reviewing and correcting any other similar record discrepancies. The NSC finding appears to be the result of errors by Pullman inspectors, who subsequently corrected these errors to indicate the actual state of activities. The inspector does not consider this to be a QA program deficiency; rather, these appear to be instances where inspection personnel were trying to show that no dam was installed as opposed to actually removing a dam.

No items of noncompliance or deviations were identified. —

14. Criterion VI, NSC Audit Finding No. 9e:

"Isometric 2-26-417: FW-144, 145, 196, and 197 were completed on May 14, 1976. The Weld Rod Requisition had been altered to add FW-197. However, the Weld Rod Requisition shows that 14 rods had been burned, which seems improbable for the four welds that were supposedly welded."

NRC Finding:

The inspector verified that the M.W. Kellogg (Pullman) Field Warehouse Requisition record indicated that four 3/4" sockets were issued on May 13, 1976 and welded on May 14, 1976. It is the inspector's opinion that 14 weld rods provide sufficient weld rod to weld the four 3/4" socket welds referred to by the NSC finding. The inspector examined Pullman procedure ESD-202, dated April 28, 1975, which states in part, in paragraph 3.2, that "For socket welds, up to four welds may be put on one requisition (weld rod requisition slip)." The inspector did find that all four socket welds were documented on one weld rod requisition slip.

The inspector concluded that this NSC finding has no safety significance and was in accordance with existing procedures.

No items of noncompliance or deviations were identified.

15. Criterion VI, NSC Audit Finding No. 10:

"No procedure or requirement prohibits the changing or alteration of the records and documents that are necessary to track the work. Field Process Sheets, Weld Rod Requisitions, inspection records, etc., should not be changed or should be changed only by Quality Assurance supervisory personnel and then signed and dated."

NRC Finding:

The inspector reviewed the historical file for ESD-223, "Installation and Inspection of Pipe Supports" and, specifically, the extensive revisions that occurred on November 11, 1975 and May 25, 1976. The inspector found that the procedure revisions contained adequate Quality Assurance/Quality Control instructions for the control and identification of Class I pipe supports. Additionally, the inspector found that other existing procedures, contained in the Pullman Quality Program, provided additional or amplifying instructions for the identification and control of Class I pipe supports.

No items of noncompliance or deviations were identified.

17. Criterion IX, NSC Audit Finding No. 3:

"The qualification and certification program for NDE and inspection personnel has been inadequate. The records of the following personnel were examined: D. R. Geske, T. L. Koch, J. E. Cawelti, G. P. Keeler, K. E. Beck, L. Glass, W. R. Johnson, E. Stanton, C. B. Athay, R. G. Sears, D. S. Tutko, J. N. Shiromizu, V. J. Casey, J. A. Brasher, L. F. Myrick, S. R. Stanley, H. Guest, D. E. Bentley, R. D. Kincade, K. D. Guy, J. R. Bowlby, E. R. Jennings, A. L. Newton, C. C. Lenzi, J. J. Sisk, L. K. Thomas, A. A. Conques, and R. L. Marks. In virtually all cases, the individuals began performing their duties without fulfilling the specified requirements. The most prevalent discrepancies are: not completing the required training, not having proof of previous experience, insufficient time as Level I, unsigned tests, and insufficient background and experience."

NRC Finding:

The inspector examined the procedures for qualification and certification of non-destructive examination and inspection personnel that existed in Pullman's program before September 1977. These are Engineering Standard-Diablo (ESD) No. 235, "Nondestructive Examination Personnel Qualification and Certification Procedure," dated September 25, 1973, and ESD No. 237, "Quality Assurance Inspector Training Program," dated February 26, 1974.

The requirements for qualification of Pullman inspectors must have been revised or amplified on or after September 25, 1973. This is based on the Pullman response, to the above NSC audit finding, which states in part, that "All current inspectors have been qualified by test as outlined in ESD-237. Requirements for qualification and certification of field inspectors were added in ESD-237 on September 25, 1973 to reflect the requirements of ANSI N45.2.6, just published. Persons hired before this time were not necessarily tested at time of hire. Subsequent to 1973, the records indicate that all inspection personnel received required training and examination." A review of the ESD-237 historical file indicated that a prior revision had occurred on May 1, 1969, however, no procedure revision could be found which was specifically dated September 25, 1973.

NRC Finding:

A review, by the inspector, of historical procedures indicates the NSC audit finding is substantiated in part. Prior to 1977, insufficient requirements existed to control the changing or alteration of quality records and documents specified in the NSC finding. The ASME certified PPP Q.A. manual program elements describing field process sheets, weld rod requisitions, and inspection records did specify the qualified personnel responsible for filling out or revising these documents; however, there was no concise administrative Q.A. program instructions written to control how changes to Q.A. field documents would be implemented. This concern had been previously addressed by Pullman's own corporate management audits, which identified a few findings of editorial changes made to Q.A. field documents without adequate administrative controls.

In response to the NSC and Pullman corporate audits, several on-site Pullman QA procedures were revised to provide more explicit administrative controls. ESD-254, entitled "Document Review", was revised on December 30, 1977 to establish for records, process sheets, requisitions, and reports that "corrections, if made, shall be initialed and dated by the responsible individual". The scope of change requirements in KFP-17 (dated August 31, 1977), the QA Manual chapter on revisions and deletions, was broadened to also include all field procedures (ESDs). Corrections and/or changes of field process sheets, according to ESD-264 (dated September 15, 1978), titled "Process Planning and Control," shall be initialed and dated, and limited to specific qualified personnel.

Neither the NSC nor the Pullman corporate audit findings, nor the staff review, identified any unapproved technical changes or other substantive changes which would have adversely affected construction quality. Rather, the issue of concern merely involves editorial field changes made to Q.A. documents and records completed prior to 1977 and the NRC finds that this concern has only minimal safety significance.

Therefore, the inspector concludes that Pullman Q.A. took effective corrective action to correct the programmatic concern identified by the NSC audit and previous Pullman corporate audits.

In conclusion, the inspector determined that Pullman Q.A. took effective corrective action in addressing the programmatic concern identified by the NSC audit and previous Pullman corporate audits. Furthermore, there is no evidence in the NSC, PG&E and Pullman corporate audits to suspect that any field changes made to pre-1977 documents and records impacted adversely on the quality of field construction.

No items of noncompliance or deviations were identified.

16. Criterion VIII, NSC Audit Finding No. 12:

"Procedure ESD-223 does not give adequate instructions for the identification and control of Class I Pipe Supports."

ESD-237, dated February 26, 1974, states in paragraph 2.3 that, "All personnel engaged as Field QA Inspectors involved in the inspection of weldments, interpretation of Engineering Specifications and Welding Procedures, and documentation work, shall be required to complete an indoctrination period as described in Section 4 of this specification." Paragraph 4.1 states that, "The indoctrination period for the Field Q.A. Inspectors described in Section 2.3 shall contain as a minimum, but not necessarily limited to, the following courses:

Visual Inspection	Welding Procedures
Welding Inspection	Welding Processes
Basic Q.A.	

Other courses offered as optional are:

Welding	Steam Power Plant Fundamentals
Basic Power Plant Instruc.	Welding & Piping Eng. Technology
Introducing Nuclear Power	(I.C.S.)

The Visual Inspection and Welding Inspection tests shall be administered and controlled by the N.D.E. Training Officer. All N.D.T. training, qualifications and certifications will be covered by ESD-235." The terms NDE and NDT are synonymous and refer to nondestructive examination.

Paragraph 4.2 states that tests used for the indoctrination courses for Field Q. A. Inspectors shall be:

1. For Basic Q.A. Test-ESD's.
2. For Weld Procedure Test-Approved Welding Procedures.
3. For the Weld Process Test, Welder Qualification Card and Pipefitter's Manual.
4. For Welding Inspection Qualifications, General Welding Information.
5. Visual Inspection Qualifications-General Dynamics NDT Introduction.

Examination of ESD-235 indicated that although this procedure is a nondestructive personnel qualification and certification procedure, the procedure also describes levels of qualification for visual inspection personnel, the type of examination, the number of questions, and the acceptable grade for the examination. Additionally, a welding test requirement is contained in paragraph 11.2.14 which states that, "A combination of General, Specific, and Practical examinations will be given using the Diablo Canyon Welding Seminar Test Paper, containing 66 questions."

Therefore, it is apparent that Field QA Inspectors were required to be indoctrinated through a program of courses related to their job function, including visual and welding inspection tests administered and controlled by the NDE Training Officer. Discussions with contractor personnel indicated that, in the pre-1977 time frame, the training officer controlled all personnel certifications, with no distinction being made between NDE and welding inspection personnel.

The inspector examined the personnel files of 20 of the 28 individuals named in the NSC audit, comparing the date when each individual started

employment with Pullman Power Products versus the date each individual started accepting work. This examination confirmed the NSC audit finding that in virtually all cases, welding Quality Assurance Inspectors began performing their duties without fulfilling the specified requirements and without completing the required training. Two examples are as follows:

- ° V. J. Casey began employment with Pullman Power Products on November 19, 1973 and began accepting weldments in November, 1973. He was not certified as a welding inspector until February 27, 1974.
- ° E. R. Jennings began employment with Pullman Power Products on January 16, 1974 and began accepting weldments on January 22, 1974. He was not certified as a welding inspector until April 21, 1974.

Additionally, two other inspectors were found to have questionable backgrounds which, in the inspector's opinion, would not warrant their immediate certification as welding inspectors. K. D. Guy had essentially no background in quality control/quality assurance, yet within two months was a fully certified inspector accepting weldments. A. L. Newton had some background in the aircraft industry, but a lapse of several years had occurred between the time he had terminated his employment in the aircraft industry and the time he began employment with Pullman. Yet within two months Newton was accepting weldments. Both of these individuals had taken several, but not all, of the required welding examination tests specified in ESD-237. Therefore, both of these individuals also began performing their duties without fulfilling the specified requirements and without completing the required training.

The failure to assure that Quality Assurance Inspectors were qualified and certified in accordance with the contractor quality procedures is considered an apparent item of noncompliance (50-275/323/83-37/01).

It should be noted that for all personnel files examined, with the exception of Messrs. Guy and Newton, all individuals appeared to be experienced, with adequate backgrounds either in welding or in the area of quality control inspection.

The inspectors review of personnel files further concluded that Pullman NDE personnel were properly certified and had not accepted or performed work prior to being certified in accordance with Pullman procedures or codes.

The inspector concurs with the NSC audit finding that welding inspection personnel performed inspections prior to being certified. The inspector does not concur with the NSC finding that NDE personnel performed nondestructive examinations prior to being certified.

18. Criterion IX, NSC Audit Finding No. 10b:

"The Ninety-Day Welders' Log was not maintained from August, 1972 to December, 1972. There is no Weekly Qualified-Welders List for that time period to substantiate that the welders were actually qualified."

NRC Finding:

The inspectors approach to resolving this issue was to examine the 90 day welders logs to determine whether the alleged gap in the log exists, to determine the basis for establishing the weekly qualified welders list, to determine whether the weekly list is available for the above time period and, if not, the reasons for the unavailability.

The inspector examined the 90 day welder's log and found that no void existed between 3/72 and 12/72. While it is true that no weekly qualified welders list exists for that time period, the basis for establishing the weekly list is the 90 day qualified welder's log. However, the inspector notes that the weekly qualified welder's list is not a document requiring retention by the Pullman Quality Assurance program. The 90 day welder's log provides documentary evidence of welder performance during a specific period, to assure qualification within code requirements. This log is based upon weld filler metal withdrawal sheets and the welder qualification records. Therefore, the inspector concludes that, based upon the records available, no code or procedural violation can be determined because the 90 day welders log existed for the time period referenced by the NSC audit and the weekly qualified welders list is not required to be retained. The NRC considers this practice acceptable.

No items of noncompliance or deviations were identified.

19. Criterion IX, NSC Audit Finding 10c:

"The Ninety-Day Welders' Log is not sufficiently detailed to determine if the welder is qualified to perform certain procedures. The Ninety-Day Welders' Log has been revised a number of times, and the detail has improved with each revision. Previous to the latest revision (November, 1974), the log was very poor in giving precise information relative to procedure and thickness ranges to which the welder was qualified."

NRC Finding:

The inspector's approach to resolving this issue was to examine a representative sample of the early 90 day qualified welder's logs and determine if the information contained was sufficient to conclude that a welder was qualified to perform certain welding procedures.

The 90 day qualified welder's logs for the period from 1972 through 1978 were examined. The log identifies the welder, weld stamp identifier, the procedures which the welder was qualified to perform, and the welding process (i.e., metal-arc, insert, Gas Tungsten Arc for both carbon and stainless steel, and Gas Metal Arc for carbon steel) qualified to perform. Process use in the 90 day log was, and still is, determined from a review of weld filler metal withdrawal sheets.

The inspector discussed the Pullman method of tracking welder qualifications with the Code Authorized Inspector who was onsite during the early construction years. The former Authorized Inspector stated that he reviewed the Pullman methodology for documenting welder

qualifications and was satisfied that the Pullman method had been acceptably implemented.

The inspector observed that the 90 day qualified welders log form had been frequently revised to provide more information; including qualification coupon wall thickness, and specific (versus general) identification of procedure and process as the number of welding procedure specifications in use expanded. In the early days of construction the number of specific welding procedures was small with these procedures being refined and narrowed in applicability as construction progressed and experience dictated.

The inspector finds that the 90 day qualified welder's log was sufficiently detailed to determine whether a welder was qualified to perform certain procedures and complied with applicable code requirements. Weldment thickness a welder was qualified to perform was added to the 90 day log as a result of an NRC concern during the later phases of construction, in order to clarify welder's qualification to make welds on limited or unlimited thickness sections. This was not a critical addition since other means existed to establish each welder's thickness qualification (ie: the original qualification record).

No items of noncompliance or deviations were identified.

20. Criterion IX, NSC Audit Finding 10d:

"No procedure states what the Field Quality Assurance Inspector uses as the primary means to determine welder qualification, the Ninety-Day Welders' Log, the Weekly Qualified Welders List, or the Welder's Qualification Card."

NRC Finding:

The inspector's approach to resolving this issue was to evaluate the validity of the NSC finding and Pullman response.

The ASME QA Manual, procedure KFP-15 (Welding Qualifications, dated August 22, 1972) generally describes the responsibility and methodology used by Pullman in assuring that welders are tested, qualified and issued a stamp. ESD-216 (Welding Performance Qualification) is the implementing procedure for the welder qualification process. Neither procedure describes precisely what the assigned Quality Assurance Inspector uses to determine whether a welder has used a specific process and is thus qualified; however, discussions with the former Authorized Inspector and Pullman personnel who have been onsite since the early 1970, indicate that weld filler metal withdrawal sheets had always been used to determine whether a particular welder had used the specific process during the previous 90 days or whether he had used another process during the extended 6 month period, specified by the ASME Code, immediately prior to the point in time under consideration.

The inspector finds that no Pullman procedure identifies what the field Quality Assurance inspector uses as a primary means to determine welder qualification, however, the practice utilized by Pullman was generally

well known by both personnel and management assigned primary responsibility for tracking welder qualification. Furthermore, the inspector considers that the method historically used by Pullman (i.e., weld filler metal withdrawal sheets and welder qualification records) was sufficient and adequate to document and verify welder qualification, as required by the ASME B&PV Code, Section IX.

No items of noncompliance or deviations were identified.

21. Criterion IX, NSC Audit Finding 10e:

"No procedure specifies who is responsible for the Ninety-Day Welders' Log, the Weekly Qualified Welder's List, or the Welder's Qualification Card; how the information is obtained; how the logs are used; to whom they are distributed; etc."

NRC Finding:

The inspector's approach to resolving this issue was to assess the validity of the NSC finding and Pullman response, examine the applicable procedural requirements and practices employed and assess the adequacy of the findings for compliance with code requirements.

As described in finding 10.d, above, the inspector examined (1) procedures KFP-15 and ESD-216, and (2) the 90 day qualified welder's logs from 1972 through 1978. The inspector found that the 90 day log was continuously maintained, except for the strike during June-November, 1974. All welders who returned following the strike were requalified by performance of test welds to reestablish a basis for the 90 day log. Both procedures (KFP-15 and ESD-216) imply that the assigned QA inspector is to keep and maintain the 90 day qualified welder's log, the weekly qualified welder's list, and the welder's qualification records. This was apparently the understanding of both the Quality Assurance inspectors and Quality Assurance management and appeared to be consistently implemented. That the procedures do not specifically assign such responsibility for the maintenance of the above documents is of minimal significance. The inspector finds that the Pullman practice and procedures for documenting and maintaining welder qualification status was and is adequate.

No items of noncompliance or deviations were identified.

22. Criterion IX, NSC Audit Finding 10f:

"Procedure KFPS-13 differs from KFP-15 in that it does not permit a six-month extension of welder qualifications if the welder has been actively welding on some other welding process. Procedure KFPS-13 requires the welder to use the specific welding process within a three-month period or be requalified. There is no evidence of adherence to this requirement for pipe support welding."

NRC Finding:

The inspector's approach to resolving this issue was to examine the NSC referenced procedures, assess the validity of the NSC finding and Pullman response, and evaluate the findings for compliance with the ASME Code.

The 1971 edition of the ASME Boiler and Pressure Vessel Code, Section IX provided, in paragraph Q-26, that "Renewal of qualification of a performance specification is required...when a welder...has not used the specific process....to weld either ferrous or nonferrous materials for a period of three months or more...." This paragraph was revised in the Winter 1971 Addenda to read "Renewal of qualification of a performance specification is required...when a welder...has not used the specific process...to weld either ferrous or nonferrous material for a period of three months or more except when employed on some other welding process the period may be extended to six months...." The inspector found that Pullman had not revised procedure KFPS-13 to reflect the revised requirements of the Winter 1971 Addenda and that, up to November 30, 1977, KFPS-13 reflected the original, more conservative, requirement of the 1971 Edition, Section IX, paragraph Q-26. The inspector also found that Pullman's welder qualification program implemented the appropriate Code requirements regarding renewal of qualification in compliance with the code preamble requiring that "Any requalifications or new qualifications shall be made in accordance with the test requirements of the current edition." Thus, the inspector finds that Pullman complied with the revised welder requalification provisions of the ASME B&PV Code, after the revision, although Pullman was slow in revising KFPS-13 to reflect the revised code requirements.

The inspector reviewed procedure KFPS-13 (Pipe Support Field Procedure - Welding Qualifications - dated December 3, 1973) and notes that paragraph 13.2.3 was revised on November 30, 1977 to reflect the applicable provision of the ASME Code, Section IX regarding renewal of qualification.

The ASME Code prescribes that the most current edition of Section IX be implemented at all times. Discussion with the Pullman Quality Assurance Manager, the Welding Qualification Quality Assurance Inspector, and the Authorized Inspector during the early construction phase, indicated that the current revision of Section IX was consistently implemented and that the apparent omission of the time extension provision of the Code in KFPS-13 was an omission of the relaxed requirements provided in Section IX. Examination of the 90 day Welder Qualification Logs for the years of 1972 through 1979 indicate that adequate welder qualification documentation was maintained. Further, discussions with the above individuals indicates that verification of a welders use of another process, as provided by Section IX, was accomplished by review of the weld filler metal withdrawal sheets which issued weld filler metal to the welder. These sheets document the procedure to be employed by the welder in performance of welding with the filler metal issued. The ASME Quality Assurance manual for code piping (KFP procedures) provided for use of the referenced ASME Section IX option; however, the Pipe Support Quality Assurance manual (KFPS procedures) were subordinate to the ASME Quality Assurance manual and, therefore, welder qualifications were accomplished using the option provided by the ASME Quality Assurance manual and

Section IX. The inspector finds that the Pullman practice for welder qualification tracking was consistent with the ASME B&PV Code.

No items of noncompliance or deviations were identified.

23. Criterion IX, NSC Audit Finding 10h:

"Procedure ESD-219 requires random sampling of in-process welding, with the sampling to be noted on the Field Process Sheets. In examining Field Process Sheets, it is obvious that the sampling by the area inspectors was not performed."

NRC Finding:

The inspector's approach to resolving this issue, was to assess the validity of the NSC finding and Pullman response and evaluate the NRC findings for safety significance and/or compliance with the Pullman program.

ESD-219 required that welder audits were to be performed on each welder every six weeks and recorded on the welder audit sheet. The procedure ESD-219 did not require that welder audits be recorded on the Field Process Sheets. The audits are a Pullman program requirement in excess of the ASME Code requirements and were performed on a sampling basis and recorded on the welder audit sheets. The welder audit sheet format was upgraded on 12/10/73, 2/4/74, 12/6/74, 6/27/74 and 6/17/76 as experience in the use of the audit sheets identified an upgrading need. The inspector examined welder audit sheets and observed that activities monitored were recorded on these welder audit sheets. The inspector considers that the performance of welder audits of each welder every six weeks was an appropriate method for recording in process welding observations. The fact that the procedure did not require that such observations be recorded on the process sheet is viewed as a finding of no safety significance since this activity is over and above the ASME Code requirements.

The inspector examined the revision/change records of procedure ESD-219 (Weld Procedure Monitoring) and observed that paragraph 4.4 was revised on December 30, 1977, apparently in response to the NSC audit finding, to prescribe that sampling checks of in process welding may be noted on the process sheet or inspectors daily work sheet.

No items of non-compliance or deviations were identified.

24. Criterion IX, NSC Audit Finding 10i:

"Procedure ESD-219 requires periodic auditing by the Welding Auditor. These audits were not performed until November 5, 1973; and Pullman Power Products was not in compliance with this procedure for approximately 23 months."

NRC Finding:

The inspector's approach to resolving this issue was to assess the validity of the NSC finding and Pullman response, and evaluate the NRC findings for conformance with the specified Pullman program.

The inspector examined the records of change/revision to ESD-219. The records show that the procedure was written in draft form on February 14, 1973. The November 1973 revision apparently was issued and implemented beginning in November 1973. Examination of the 1973, 1974 and 1975 welder audit sheets indicate that the required welder audits were performed beginning November 1, 1973. Discrepant findings appear to have been adequately dealt with and resolved.

The ASME Code does not contain any requirements for performance of welding audits. The Pullman program for conducting welder audits appears to be in excess of ASME Code or AWS D1.1 requirements and the NRC finds no irregularities in the Pullman implementation of this welder audit program.

The inspector concurs with the NSC finding that these audits were not performed until early November 1973, and concurs with the Pullman response that ESD-219 was not written until February, 1973. The procedure implementation appears to have begun in November 1973.

Based on the above, the inspector was not able to corroborate the NSC statement that Pullman was in noncompliance with the procedure for about 23 months.

The inspector concludes that Pullman did implement a program of periodic welder audits in 1973 shortly after procedure ESD-219 was issued. Pullman apparently exceeded the requirements of the ASME Code and AWS D1.1 in the area of welder auditing and had implemented a program consistent with industry practice of the time in the area of welder auditing.

No items of noncompliance or deviations were identified.

25. Criterion IX, NSC Audit Finding 10j:

Procedure ESD-219 requires monitoring stainless steel welds for ferrite control. However, the Severin Gauges were not on site until the beginning of 1973; and Pullman Power Products was not in compliance with this procedure for approximately 12 months.

NRC Finding:

The inspector's approach to resolving this issue was to examine the Pullman response to the NSC finding, establish the degree of response validity and have Parameter, Inc., an NRC consultant, independently examine a sample of stainless steel welds in Unit 1 for delta-ferrite and establish the degree of conformance with regulatory requirements.

Based on discussions with PG&E personnel it appears that stainless steel welding on site began in early 1973. Indications are that the early stainless steel on-site welding was performed on radioactive waste

systems, a non-safety related activity. Prior to this time stainless steel welding was performed on prefabricated pipe spools at the Kellogg-Pullman shop in Paramount, California. Procedure ESD-219 was issued for implementation in November 1973, shortly after the beginning of site stainless steel welding. The first Severin gauge was received on-site about December 20, 1972 and the second was received about January 30, 1973. Thus, the inspector was not able to corroborate that Pullman was in noncompliance with this procedure requirement for 12 months.

As an additional check the inspector chose a random sample of 25 stainless steel welds in Unit 1 and had these welds examined for delta-ferrite by Parameter, Inc. personnel. The results of this examination are listed in Attachment 1 of this report and indicate that all welds examined complied with delta-ferrite acceptance criteria.

No items of noncompliance or deviations were identified.

26. Criterion IX, NSC Audit Finding No. 10k:

"Hangers are not welded in accordance with Pacific Gas and Electric Company requirement. Hangers 2023-IV and 2039-2V are two examples of a number of hangers observed that are welded to the structural steel on the wrong side of the bracket."

NRC Finding:

The inspector examined Hanger No. 2039-2V, the related hanger drawing, and determined that the hanger is Class II/E hanger which received no quality control inspection hence no field weld process sheets were generated or available for review nor were they required. Class II/E components are not safety related and, hence, not included in the quality assurance/control program. NRC examination of the hanger drawing established that the drawing called out a 1/4" fillet weld on the front and back of the beam attachment. The beam attachment is the only component specified on the drawing as requiring welding. The inspector found the beam attachment to be welded as specified on the drawing. NRC examination of Hanger No. 2023-IV (a Class I hanger) and the related hanger drawing established that the beam attachment was welded as specified on the hanger drawing. Both of these hangers are located in Unit No. 2.

The inspector concludes that the Pullman response to the NSC finding is accurate and that the NSC finding was in error.

During the field examination of the above noted hangers the inspector selected eight additional hangers from the same general area with similar configurations. The inspector noted that all hangers chosen were similar to Hanger Nos. 2039-2V and 2023-IV; that is, a welded beam attachment supporting a spring hanger. All of these hangers are located at approximately the 130' elevation in the general area where the main steam lines exit Containment No. 2. The following hangers and their related hanger drawings were examined and found to conform to the specified drawing requirements.

<u>Hanger No.</u>	<u>Class Designation</u>
2040-1V	Class II/E
2023-7V	Class II/E
2023-6V	Class II/E
2021-4V	Class I
2023-5V	Class II/E
2021-3V	Class I
2037-1V	Class I
2021-1V	Class II/E

No items of noncompliance or deviations were identified.

27. Criterion IX, NSC Audit Finding 101:

"The interface of welding to other suppliers' parts and components is not clear. Welding is done to join Westinghouse and Paramount parts and components. The necessity for addressing impact property requirements for those weldments is not clear; in addition, the requirements for addressing impact property requirements for Pullman Power Products field welds are not clear. If impact properties are necessary, the acceptability of each weld that has been repaired and subjected to more than one stress relief is indeterminate because of the time at temperature limitations within the qualified weld procedure."

NRC Finding:

The NRC approach to resolving this issue was to examine the requirements of the Code in the area of impact testing and evaluate the NSC finding and Pullman response in this area.

The 1971 addenda to ASA B31.7 states, in paragraph 1-723.2.3, that "When the design specification requires impact testing of ferritic steel materials, the tests and acceptance standards shall be in accordance with the requirements of Appendix I." The 1970 edition of B31.7, same paragraph, requires evaluation of toughness properties if service is expected to be less than 30°F.

PG&E specification number 8711, imposed on Pullman, doesn't require impact testing of qualification welds for procedure qualification; thus, impact testing of procedure qualification weldments was not performed. The inspector further observes that impact testing is not unilaterally required for such weldments by the B31.7 Code. Specification 8711, Change 12, requires compliance to the 1970 Addenda of ASA B31.7.

The inspector finds that Pullman procedures for impact testing of qualification weldments and specification 8711 are consistent with B31.7 Code requirements.

No items of noncompliance or deviations were identified.

28. Criterion IX, NSC Audit Finding 10m:

"Some welders do not receive sufficient training. Welders, fabricating the pipe rupture restraints within the containment, are welding heavy plate. While these welders are qualified by virtue of welding heavy wall pipe, the techniques are different. The welders who were already qualified to heavy wall pipe were not given additional training on plate."

NRC Finding:

The inspector's approach to resolving this issue was to examine the code requirements in this area and evaluate the validity of the NSC and Pullman response.

The 1974 Edition of the ASME B&PV Code, Section IX, paragraph QW 303.5 states "...qualification on pipe shall qualify for plate, but not vice-versa except that qualification on plate shall qualify for pipe over 24 inches in diameter." Therefore, it appears that the Code recognizes pipe as more difficult to weld than plate. The Code does not require additional training on plate for welders originally qualified on pipe. These Code requirements are also reflected in the current edition of Section IX, table QW-461.9.

Qualification on heavy wall pipe (wall thickness greater than about 0.75") requires additional qualification by performance of welds on thicker members; so also does qualification to weld heavy plate.

The inspector found that Pullman welder qualification procedures comply with Code Section IX requirements. The NSC audit finding appears to apply an interpretation which is not supported by Code requirements.

No items of noncompliance or deviations were identified.

29. Criterion IX, NSC Audit Finding 10n:

"There is no procedure for preheating weld joints."

NRC Finding:

The inspector evaluated the validity of the NSC finding and Pullman response and evaluated the Pullman preheat program for conformance with specified requirements.

Specification 8711 prescribes that preheating may be performed using either the electrical resistance heating method or localized torch method in conjunction with appropriate tempil sticks.

The inspector examined the following welding procedure code numbers and welding procedure specifications and found that each contained an adequate definition of preheat, postweld heat treatment and interpass temperature requirements: Code Nos. 4/5, 7/8, 15/16, 79/80, 86/87, 88/89, 92/93, 105/106, 129, 134, 149, 150, 200, 201, 202, 203 and 208; Welding Procedure Specification Nos. 88-I-4/5-K-12, 90-I-8/4-K-12, 100-III-8/45-OB-1, 408-III-CARP20-OB-1, 409-III-34-OB-1, and 507-I-42-OB-1.

ESD-218 (Postweld Heat and Preheat Treatment Procedure) was revised and improved December 30, 1977 to prescribe preheat requirements and indicate preheat applicability, in addition to the information prescribed on the Welding Procedure Specifications.

ESD-264 (Process Planning and Control-Field Process Sheet) was reviewed by the inspector. The Field Process Sheets were revised in early 1978 to indicate preheat requirements. Prior to early 1978, compliance with the preheat requirement was dependent on the welder's knowledge of and compliance with the welding procedure specification and was indicated on the process sheet by the craftsman and QC signature in the welding block, which specified the welding procedure to be used. The philosophy used was that when each signed a block, the signature meant that all applicable procedure requirements had been accomplished.

The inspector concludes that, while no separate and specific procedure for preheating of weld joints existed prior to December 30, 1977, preheating requirements were adequately prescribed by the welding procedure specifications and documented by signature on the welding block of the process sheet, which specified the applicable welding procedure.

No items of noncompliance or deviations were identified. —

30. Criterion IX, NSC Audit Finding 100:

"The initial results of the welding auditing (from November 5, 1973 to February, 1974) indicate that the following problems existed:

- (1) The welders did not understand shielding and purging.
- (2) Tempil sticks were not used.
- (3) Amperages were not within procedure limits (mainly root welds and tack welds).
- (4) Weld procedures were not available, and many welders did not know where to obtain them.
- (5) The oxygen analyzer was not available and not operative. Also, the time vs. flow rate alternate technique was not used.
- (6) Oven rod temperature control was not monitored by the welders.
- (7) Many welders did not understand their duties and responsibilities.

Based on a review of the Pullman Power Products welding audit reports and the frequency of the above-noted problem areas, there is no confidence that welding done prior to early 1974 was performed in accordance with welding specification requirements."

NRC Finding:

The inspector's approach was to examine the records of welder audits conducted during the above time period and assess the validity of the NSC

finding and Pullman response. The welder audit program is an example of extra effort, not required by the Code, to provide assurance of a quality welding program implementation and effect prompt corrective action for identified discrepancies.

The inspector critically examined the records of welder audits performed between November 1, 1973 and April 1, 1974. A total of 183 welder audit records were examined. Each of the above NSC audit statements are addressed below.

The NSC audit statement was that "The welders did not understand shielding and purging." The inspector observed that 23 of the reviewed audits identified problems regarding compliance with the 20 psi and 20 cfm requirements for gas pressure and flow. Weld quality problems could occur if the gas flow rates are excessively high or low. The vast majority of safety-related stainless steel welds were radiographically examined and the film was reviewed and accepted by a qualified interpreter for code compliance. The audit findings did not indicate that welders did not understand shielding and purging, rather the findings point out the difficulties which can be experienced when more than one purge/shield line is connected to a single gas source and regulator. In all cases, corrective action was taken to return the pressure and flow rate to the required values.

The NSC audit identified that tempil sticks were not used. The purpose of Tempil sticks is to verify proper preheat and assure that the interpass temperature was low enough to begin welding the next weld pass. Of the 183 audits examined, fourteen of the audits identified that the welders did not have tempil sticks in their possession. In each case action was taken to provide the welder with Tempil sticks. Several of the welders apparently told the auditors that prior to resuming welding they wait until they can touch the weld; thus providing assurance that interpass temperature requirements are not exceeded. This is an acceptable practice.

The NSC audit identified that amperages were not within procedure limits. Of the 183 audits reviewed, four instances were identified wherein amperages were not within welding procedure specification limits. In each case the welder corrected his amperage setting. A lower than acceptable amperage would result in lack of adequate root penetration or lack of acceptable heat affected zone fusion, which would be seen in a radiograph and may be detectable by surface examination methods, such as the liquid penetrant or magnetic particle techniques. High amperage would result in excessive spatter, a condition which qualified welders would not weld under because welding is quite difficult under high amperage conditions. Further, amperage is not an essential variable specified by the ASME Code, Section IX and is only a supplementary essential variable for material with notch toughness requirements.

The NSC audit identified that weld procedures were not available and many welders did not know where to obtain them. Welders are required to have a copy of the welding procedure at the job location. Of the 183 audits examined, five audits identified cases where the welder did not have a welding procedure. Three of the five cases identified that the welder

did not know where to obtain them. In each case the corrective action was to have the welder obtain a copy of the welding procedure along with an explanation of the location from where they could be obtained. The inspector concludes that the vast majority of welders used welding procedures and knew where to obtain them and that this NSC finding has only minor technical significance.

The NSC audit indicates that the oxygen analyzer was not available or operational. Although this was not a required checkpoint, only one finding of the 183 audits reviewed indicated a problem with the oxygen analyzer. This problem was corrected. Thus, the inspector considers that the welder audit records do not support the NSC conclusion.

The NSC audit indicates that oven rod temperature control was not monitored by the welders. Of the 183 welder audit records reviewed, fourteen of these audits identified instances where the welders rod oven temperatures were lower than the 225°F required by Pullman procedure, and did not meet the 225°F requirement. Most instances observed by the auditors identified deviations up to 35°F, however, two audits observed temperatures as low as 150°F. In all cases the welder was required to return the defective oven to the rod room and obtain another. The audits further indicate that a large number of the apparently discrepant findings were due to the thermometer being out of calibration and reading low, thus indicating that the actual temperature of the oven was higher than that indicated on the thermometers. The primary reason that rod ovens are maintained hot is to preclude moisture entry into the welding electrode coating and, thus, minimize the potential for inducing underbead cracking. Recent industry findings indicate that when the temperature of the weld rod is maintained significantly in excess of the atmospheric temperature, thus above the dew point, the entry of moisture into the coating is effectively precluded. The NSC finding that rod oven temperature was not monitored by the welders is not supported by the inspector's review of the audits, although isolated instances of ovens being below temperature were identified by the audits. In addition, this should not be a technical problem because rod is removed from a hermetically sealed shipping container and immediately put into an oven with temperatures of sufficient value to preclude moisture intrusion.

The NSC audit indicated that many welders did not understand their duties and responsibilities. The NRC considers that the reason these welder audits were done was to identify such instances and provide corrective action. Of the 183 audits reviewed, five welder audits indicated that the welder in question did not understand their duties and responsibilities. In each case the welder was reinstructed by the Quality Assurance inspector auditing the welding activities, including notification and reinstruction of the welder's foreman, as applicable.

It is important to recognize that none of these were NSC findings, but were instead findings of the Pullman welder audit program, which was designed to detect program weaknesses and provide prompt corrective action during the early phases of site welding activity.

In summary, the inspector notes that isolated instances of problem areas were identified and corrected by the Pullman welding inspectors.

However, the inspector does not consider the aggregate of problem areas to be so pervasive such that support can be given the NSC conclusion that "There is no confidence that welding done prior to early 1974 was performed in accordance with welding specification requirements."

No items of noncompliance or deviations were identified.

31. Criterion X, NSC Audit Finding Nos. 5 and 6:

Finding 5: "For all inspection processes, there is no mechanism to provide the inspector the particular characteristic to be inspected; the particular acceptance criteria; the particular methods and equipment to be used; and provisions for recording results, other than acceptance for the particular inspection being made. The exceptions to this statement are radiography, where the reader sheet allows the recording of results, and those procedures that specify the use of particular equipment (such as some of the ultrasonic procedures)."

Finding 6: "The inspection process is generally not auditable. The practice of exhibiting an acceptance signature only does not permit auditing to determine if the individual characteristics were examined, the correct criteria were used for acceptance, and the correct specific measuring devices were used."

NRC Finding:

To resolve this issue the inspector examined the Pullman program procedures in this area, the validity of the NSC findings and Pullman responses and examined field process sheets to verify compliance with the prescribed Pullman program and 10 CFR 50, Appendix B, Criterion X.

The inspector examined ESD-264 (Process Planning and Control - Field Process Sheet) and observed that the field process sheets do identify, and are required to identify, the procedures necessary to perform a particular inspection. The inspector's signature is meant to verify that the required inspections were performed in accordance with the referenced procedure.

Examination of some of the procedures referenced on the process sheet indicates that each contains numerous inspection requirements and acceptance criteria. These inspection requirements and criteria are so numerous that inclusion of each on the field process sheet would excessively complicate the process sheet. The inspector considers that inclusion of each inspection requirement and acceptance criteria on the process sheet would decrease the effectiveness, and work process continuity, afforded by the field process sheet.

Examination of about 100 completed field process sheets indicates that the required procedures were consistently identified on the process sheet, thus identifying the group of inspections and examinations to be performed by field inspectors.

The NSC finding that the inspection process is generally not auditable is true if one defines auditability as the ability to verify, after the

inspection, that each inspection requirement and acceptance criteria was considered and so documented by the inspector's signature by each requirement and criteria. However, if one accepts the philosophy that the inspector's signature verifies the conduct of inspection/examination in accordance with the identified procedure, then the inspection process is auditable. The inspector considers the Pullman practice acceptable, in accordance with standard industry practice, and in compliance with ASME code requirements, which do not provide specific rules and guidance in this area.

No items of noncompliance or deviations were identified.

32. Criterion X, NSC Audit Finding No. 7:

"A large number of welds in Unit 2, System 14 (FW-110, 111, and 112 in isometric package 2-14-31 are examples) were accepted for visual examination and thereafter accepted based on surface NDE inspection (MT or PT). Visual examination of those welds indicates that the surface is not suitable for the performance of surface NDE inspection."

NRC Finding:

The NRC retained the services of a certified level II Liquid Penetrant Examiner through Parameter, Incorporated.

The certified examiner was directed to evaluate the surface condition of field welds 110, 111 and 112 on isometric 2-14-31 (Component Cooling Water System-Return Header B) and perform, and interpret the results of, liquid penetrant tests on those welds. The NRC consultant determined that the surface condition of those welds was acceptable for surface NDE inspection. All welds examined, except for an indication near FW-111, were found to be acceptable. The examiner observed an indication approximately 1½ inches long in the base metal of the pipe about 3/8" from Field Weld-111. The examiner's findings are detailed in Attachment 1 to this report.

Pullman wrote Discrepancy Report No. 5567 to remove the indication by flapper wheel grinding and conduct further liquid penetrant examinations. The inspector observed these activities. The indication was determined to be a shallow surface lap in the metal caused by the rolling operation during pipe fabrication. The indication was removed by grinding. Subsequent liquid penetrant examination verified that the indication was a surface type and not a rejectable indication, even prior to removal of the indication. The grinding operation did not violate minimum wall thickness criteria.

The inspector concludes that the NSC finding (that the surface of the welds was not acceptable for surface NDE inspection) was in error.

No items of noncompliance or deviations were identified.

33. Criterion X NSC Audit Finding No. 9:

"FW-83 (isometric package 1-10-9) was repaired in accordance with a valid Process Sheet. The radiograph of FW-83 does not exhibit the required R1 symbol, but R1 was inked onto the radiograph. There is a surface defect that is questionable for acceptance to visual standards."

NRC Finding:

The NRC retained the services of a qualified radiograph interpreter who examined 102 radiographs of various welds in several Unit 1 systems. The results of this examination are contained in the attached Parameter, Inc. report (Attachment 1). This examination included the FW-83 radiograph following repair.

The Parameter consultant examined both the original radiograph, and the radiograph following repair, of FW-83 and concluded that both radiographs were of the same weld. Further, the Parameter Consultant informed the inspector that while inking of numbers onto a film is not desirable, it is sometimes done because the lead labels may have fallen off or were positioned outside the film area. This isolated instance would not make a radiograph unusable. The code prohibits marking of radiographs in the area to be examined. Thus, the inspector finds that the fact that R1 was inked onto the repair radiograph, outside of the area to be examined, has no safety significance and is not a violation of code or regulatory requirements.

The inspector examined the surface of FW-83 in the field and found that the weld does not contain a surface defect. The inspector did observe a gradually sloped grinding line (about 1/8" wide, 2" long and less than 1/64" deep) which may be what the NSC referred to as a "defect". The depth obviously did not violate minimum wall thickness criteria. Discussions with the Parameter, Inc. radiograph interpreter indicated that the observed densities did not vary significantly on the film, thus indicating that the grinding line was not of sufficient depth to significantly decrease wall thickness in the weld area.

No items of noncompliance or deviations were identified.

34. Criterion X, NSC Audit Finding 10a:

"Records of welder qualification prior to 1972 are not available."

NRC Finding:

The inspector's approach to resolving this issue was to determine if welder qualification documentation was available prior to 1972 and to assess the validity of the Pullman response to the NSC finding.

The inspector examined welder qualification documentation, including weld coupon test results; form titled "Manufacturer's Record of Welder Performance Qualification Tests on Groove Welds." The inspector found that 20 welders (welder stamp letters A, B, C, D, E, F, G, H, I, J, K, L, N, O, Q, R, S, T, U, and V) were qualified during the period beginning August 4, 1971 and ending December 23, 1971. There are no indications

that safety related welding was performed prior to August 4, 1971. The inspector did not corroborate the NSC finding.

The 90 day qualified welders log was started at the beginning of 1972 and was continued through the present time, except for the labor dispute between June and November, 1974.

The inspector concludes that records of welder qualification prior to 1972 were available and were in acceptable order.

No items of noncompliance or deviations were identified.

35. Criterion XI, NSC Audit Finding No. 5:

"The B31.1 and B31.7 Codes required that all piping is leak-tested, where practicable. Pullman Power Products is only leak-testing Class A and B piping and that Class C piping specified by Pacific Gas & Electric Company. Classes D, E special, and E piping is not being leak-tested. A letter from Pacific Gas & Electric Company (dated January 13, 1976) does exist, which states that Pacific Gas & Electric Company will assume responsibility for the leak-testing of Class C piping. There is concern that Pullman Power Products is not discharging its contractual obligations (that specify compliance to B31.1 and B31.7) by not performing piping leak-testing to Code requirements for Classes C, D, E special, and E piping systems and, as a result, may be legally vulnerable."

NRC Finding:

The inspector examined the referenced licensee letter dated January 13, 1976 and a contractor letter dated January 8, 1976 relieving Pullman Power Products of responsibility for code compliance on Class C components. The inspector also found that the licensee did not have a piping class designated as Class D. Additionally, the inspector found that Class E and Class E special are (were) being hydrotested, though (in some cases) at less than code requirements. ANSI B31.7 allows, in paragraph 737.4, for components to be tested at less than code requirements, because of limiting components within the piping system. The inspector has no further questions on this subject.

The inspector concluded that Pullman appeared to be properly discharging their contractual requirements in this area.

No items of noncompliance or deviations were identified.

36. Criterion XII, NSC Audit Finding No. 3d:

"Severin Gauges 2947 and 2971 were received on the site in January, 1973. Initial calibration was August 29, 1973; and the next calibration was November 19, 1974 for gauge 2947 and January 23, 1975 for gauge 2971. Procedure ESD-213 requires annual calibration."

NRC Finding:

Field Procedure ESD-213, "Gauge and Instrument Control/Calibration", does require an annual calibration check of the two onsite severin gauges (2947 and 2971). There are equipment calibration record cards which document calibration status and provide a historical record of the frequency of calibration checks performed since August 1973. These records verify the NSC finding and indicate a subsequent history of consistently exceeding the required frequency of calibration checks.

Associated test equipment control records establish, since 1978 (the custody log was not maintained prior to this time), that neither gauge was ever used during any out-of-calibration period for material testing. In each case, the instrument was logged out for calibration check and unavailable for testing during the lapsed period. Documentation since 1973, which verify calibration checks performed on-site by PPP personnel or by Severin Engineering Company, provide no evidence that either gauge was discovered to be out-of-tolerance. Test equipment control implementation appears to adequately remove from service any instrument exceeding the required re-calibration date. There is no evidence to indicate that Severin gauges 2947 and 2971 were used in ferrite examinations when these gauges were outside of their calibration limits.

In conclusion, the NSC audit finding was substantiated but determined to have no safety significance. Evidence indicates test equipment control was adequately implemented since August of 1973 and was under control.

No items of noncompliance or deviations were identified.

37. Criterion XII, NSC Audit Finding No. 3f:

"There is no documentation available to verify calibration of "Tong Test" amp meters."

NRC Finding:

Tong test amp meters were contracted off-site for the required periodic calibration checks. An equipment calibration record card exists for each instrument, documenting the frequency of calibration checks performed since the particular tester was acquired. Calibration certificates are on file from the applicable lab verifying completed calibration for each tong tester. These records appear to provide adequate documentation that "Tong Test" amp meters were being calibrated.

No items of noncompliance or deviations were identified.

38. Criterion XII, NSC Audit Finding No. 3g:

"Tong Test amp meter TT2527403 was out of calibration for the period December 12, 1976 to January 31, 1977. No DR has been written against that instrument."

NRC Finding:

NRC review of the equipment calibration record cards for "Tong Test" amp meter TT2527403 (200 amp Crompton Parkinson) supports the NSC finding concerning the period out-of-calibration. Records also indicate several subsequent time periods where the calibration check frequency had exceeded the ESD-213 annual requirement for this Tong Tester and two others. It would appear the fundamental cause for these apparent lapses in calibration control were due to the transit time necessary to ship instruments back and forth from the contracted calibrating facility. Equipment control records clearly establish that, since 1978 (prior records were not kept), none of the other Tong testers examined were ever used during an out-of-calibration period. Unfortunately, for meter TT2527403 equipment control records were not retained when the instrument was broken and removed from service April 15, 1983 (although calibration records are still on file).

Based upon PPP past history of adequate test equipment control and the non-essential nature of the welding current parameter (as identified by ASME code) the inspector considers this item to have no safety significance. This activity was under control.

No items of noncompliance or deviations were identified.

39. Criterion XIII, NSC Audit Finding 5:

"Handling procedures do not exist; and the only handling instructions are contained in ESD-222 and a number of other procedures, which contain a caution against the use of carbon steel in handling stainless steel. Procedure ESD-259 has excellent detail as to the handling of Grinnell Snubbers during installation. However, Procedure ESD-259 was issued January 27, 1977; and there is not assurance that materials, parts, and components were properly handled during the period prior to January 27, 1977, when most of the installation activities were occurring."

NRC Finding:

The inspector examined those handling activities which were performed by both the licensee and Pullman to establish the validity of the NSC finding and Pullman response.

The inspector discussed, with Pullman and licensee personnel who were working at the site since the early 1970s, the practices employed regarding receiving, storage and handling of safety related equipment, including which organizations performed such activities and under what circumstances these activities were performed.

The inspector determined that PG&E received, stored, handled, surveilled, and maintained all large class 1 components (including pipe, pipe spools, valves, snubbers, motors, etc). Contractors, such as Pullman, would requisition components when the contractor was ready and required to install the particular component in the plant. The primary reason that the licensee performed the above activities was because warehouse and laydown space was limited at the site. To obtain sufficient area for warehousing and laydown, the licensee used the larger areas available at Pismo Beach, California. Items shipped to PG&E for use at Diablo Canyon

were received and stored in the Pismo Beach areas until contractors were ready to install those particular items. The material was then loaded onto trucks, by the licensee, and off loaded at the site, by the contractor under licensee surveillance, and moved into the plant. The contractor, prior to accepting custody of the component or equipment, would perform receipt inspection activities, after which the component was moved into the plant. From the time the contractor accepted the material until such time as the system/component was turned over to the licensee, the contractor was responsible to perform necessary surveillance and maintenance activities, as appropriate. . . .

The inspector examined the following procedures detailing the licensee's program for handling of equipment. The requirement for such a program was contained in the licensee's Quality Assurance Manual, procedure PRC-1 (Receiving Inspection, Storage and Handling). Procedures implementing the required program, for mechanical equipment, were reviewed.

MFI-0-1 (dated September 17, 1971): Mechanical Department Procedure - Receiving, Inspection, Handling and Storage of Equipment/Materials.

- ° The inspector found that this procedure accomplished the following:
 - °° assigned responsibility for accomplishment
 - °° provided adequate handling instructions
 - °° provided detailed inspection requirements
 - °° provided adequate storage requirements
 - °° provided adequately for accomplishment of surveillance while in storage
 - °° provided the mechanism for processing and responding to contractor requests for transfer of the equipment to the plant
 - °° provided for keeping equipment history records from receiving through shipping and storage.

MFI-2-2 (Revisions dated 10/75, 5/72 and 8/70): Mechanical Department Procedure - Instructions to Inspectors - Power Plant Piping

- ° The inspector found that the procedure accomplished the following:
 - °° assigned responsibilities for accomplishment
 - °° adequately addressed inspector qualifications
 - °° adequately defined inspector duties
 - °° provided adequate handling instructions
 - °° provided adequate storage surveillance and installation inspection requirements.

The licensee contracted with Bigge Crane and Rigging Company for the conduct of handling activities at the Pismo Beach Yard and transfer of material to the site. The inspector examined the Bigge "Procedure for Receiving, Handling and Storing Nuclear Power Plant Equipment and Material - Pismo Beach Yard." This procedure provided (1) adequate instructions for receiving and unloading, (2) adequate instructions for storage, (3) adequate instructions for preservation, (4) adequate instructions for care and handling of Stainless Steel and Class I items, (5) adequate instructions for load-out and hauling, and (6) adequate

instructions regarding types of handling equipment necessary and inspections necessary for handling gear.

The inspector examined the following documents which provided handling instructions for Pullman personnel.

Specification 8711 (Specification for Erecting Main Systems Piping and Furnishing, Fabricating and Erecting Balance of Power Plant Piping

- ° paragraph 6.12 provides definition of responsibility for receipt inspection, including general receipt inspection criteria, and unloading of carriers.
- ° paragraph 6.13 addresses storing of material including general contractor requirements such as protecting items in storage from damage by requiring "use of dust proof, fireproof and waterproof tarpaulins, adequate spacing and temporary heaters", as necessary.
- ° paragraph 6.23 requires that all material be stored on cribbing when in laydown areas.
- ° paragraph 4.1181 and 82 contain specific requirements for welding electrode receiving, storage and control.
- ° paragraph 3.211 of Section 4 provides for Quality Assurance requirements related to handling, storage, packaging, shipping and preservation.

ASME QA Manual Procedure KFP-7 (Receiving Inspection)

- ° provides that inspections be conducted to verify that off-loaded items are to prevent damage, contamination or deterioration.

ESD-215 (dated September 23, 1971): Visual Inspection

This procedure provided requirements for handling such as (1) flame cutting of stainless steel was not allowed; (2) weld preparation dressing requirements; (3) examination for and removal of mill scale, oil, rust, slag, paint, marking materials and surface oxide and dirt prior to welding; (4) removal of arc strikes and subsequent liquid penetrant retest; (5) pipe alignment criteria; and (6) cleaning.

Quality Assurance Instruction 94 (dated July 29, 1973): Performing Maintenance Surveillance

This procedure contained criteria for capping of pipe ends, actions required when loose nuts/bolts, missing parts or equipment damage was observed. The instruction provides inspection guidance for both hangers, snubbers and piping.

ESD-217 (dated September 23, 1971): Receiving Class 1 Procedure

This procedure requires monthly maintenance surveillance reports for items in storage such as Class 1 pipe, Class 1 Pipe Supports, Class 1

valves, and Class 1 pipe, valves and supports erected and installed. Protection and maintenance requirements were provided by PG&E.

ESD-222 (dated February 23, 1972): Protection, Installation, Maintenance and Surveillance of Control Valves

This procedure specifies appropriate handling requirements and criteria for pneumatic and motor operated valves and attached devices, manual operated valves, and relief valves, from receipt through installation.

Beginning about April, 1977, PG&E installed a snubber test facility on the upper floor of the fuel handling building, between the Unit 1 and Unit 2 areas. All-Grinnell hydraulic snubbers were removed, reworked, refurbished and subjected to dynamic stroke, lockup and load tests on the testing machine. Snubbers determined by test to be acceptable were reinstalled. Unacceptable snubbers were either reworked and retested or replaced with an acceptable snubber. This activity was completed in 1978 and, thus, verified the operability of Grinnell hydraulic snubbers installed prior to the issuance of ESD-259. The information gleaned from this testing program was incorporated into ESD-259 revisions in order to minimize the potential for harm or deterioration of the snubbers. Snubbers installed out of doors were also placed inside a rubber boot to prevent deterioration and corrosion of snubber shafts.

Unit 2 hydraulic snubber maintenance is performed every 6 months on each Unit 2 Grinnell snubber and this activity tracked by Pullman.

It is correct, that Pullman did not have a procedure specifically addressing handling instructions. However, viewing in the aggregate all of the Pullman procedures applicable to Pullman equipment handling and considering the limited scope of equipment handling Pullman was required to exercise, the inspector concludes that appropriate and adequate handling requirements were in place. The inspector also finds that the limited addressing of snubber handling requirements prior to the issuance of ESD-259 is of minimal safety significance given the conduct of the 1977-78 testing program and the subsequent issuance and upgrading of ESD-259.

No items of noncompliance or deviations were identified.

40. Criterion XIV, NSC Audit Finding No. 1

"The major mechanism that exhibits the status of the work is the Field Process Sheet. The Field Process Sheet provides for performance status of some important fabrication steps and for inspection status. However, many important fabrication steps are not indicated by the Field Process Sheet: erection steps; cleaning prior to installation of insulation; and some critical welding steps as preheating, checking gas flows, and checking for O₂ content in the backing gas. The Field Process Sheet, as a mechanism to exhibit status, is considered inadequate. The inadequacy of the Field Process Sheet is considered a major weakness in the Pullman Power Products System." - -

NRC Finding: The NRC findings relative to Field Process Sheets are contained in paragraphs 7 and 31 of this report.

Based upon the discussions contained in these paragraphs the inspector concludes that the use of the field process sheet adequately controlled and specified required work activities. Specific steps for fabrication, erection, welding, etc. are not required to be listed on the Field Process Sheet. Status of these activities can be ascertained by reviewing the actual field procedure. The Field Process sheet sequences, by procedure, the required construction events. It is not a mechanism to maintain status of specific work steps.

No items of noncompliance or deviations were identified.

41. Criterion XVI, NSC Audit Finding No. 2:

"Based on the results of this audit and the problems encountered in the past, it appears that a corrective action system has not been operative."

NRC Finding:

The inspector examined corrective actions taken as a result of items identified by licensee audits, Pullman Management audits and the NRC, and found corrective actions had been taken, as appropriate, when problems were identified. For example each of the following represent corrective actions taken in response to audit findings: the pipe support procedure was extensively rewritten in June 25, 1975; Quality Assurance Instruction No. 98 was created for the inspection of existing concrete expansion anchors; and in March 13, 1979 the pipe support quality assurance manual was superceded by ESD-223 to provide all the elements of installation, inspection, and as-builting of pipe supports in one procedure. Additionally, as a result of NRC identified discrepancies with radiographs (Reference: Inspection Report No. 50-275/77-06 dated May 6, 1977) the licensee committed to requiring that all radiographs would be reviewed by a Level III or a second Level II individual.

During this inspection, an NRC consultant reviewed 102 radiographs, to confirm the corrective action on the radiographs, and to confirm that all the radiographs were reviewed by a Level III or a second Level II radiographer. No discrepancies were identified during this review by the NRC consultant.

The discussion in paragraph 42, below, is particularly germain to this issue.

The inspector concludes that the Pullman corrective action system has been operative.

No items of noncompliance or deviations were identified.

42. Criterion XVIII, NSC Audit Finding No. 3:

"In response to KFP-18, Paragraph 18.2.1, management audits were performed approximately every six months. Check sheets were employed.

Based on the results of this audit and the results of Pacific Gas & Electric Company audits, these management audits appear to have been ineffectual."

NRC Finding:

Corporate management audits, conducted from September 1972 through February 1978, of the Pullman on-site Quality Assurance program were reviewed for content, completeness, and effectiveness. There is a file of ten management audit reports, performed during this time period, indicating that comprehensive inspections were conducted by the Pullman Corporate office on approximately a semi-annual frequency. In accordance with Q.A. program element KFP-18 (dated January 4, 1973) these audit reports specifically identified deficiencies, provided recommendations for corrective action and required on-site resolution by the responsible supervisor. As appropriate, each report followed up on the adequacy of corrective action implemented to correct and improve previously identified deficient conditions in the Quality Assurance program.

As a further significant improvement to their program Pullman revised KFP-18 on December 30, 1977 to require direct written response from the resident construction manager and the field Quality Assurance/Quality Control manager for "Schedule completion of implementation of corrective action and measures taken to preclude re-occurrence." The field Quality Assurance/Quality Control manager is responsible to monitor audit findings for trends.

In conclusion, there is every indication the on-site PPP Quality Assurance organization was responsive to corporate management audits and there is no basis to suggest these audits were ineffectual.

No items of noncompliance or deviations were identified.

43. Criterion XVIII, NSC Audit Finding No. 5:

"In response to KFP-18 and KFPS-16, internal audits were performed every six months. Check sheets were not employed."

NRC Finding:

At the time of the NSC finding, checksheets were not being used by the onsite Quality Assurance organization to perform internal audits. Corporate audits, being performed by Williamsport Headquarters personnel, did use checksheets to coordinate their inspections. This inconsistency was resolved when internal auditing became proceduralized in June 1978, by the evolution of field procedure ESD-263. The scheduling of program elements to be audited and use of checksheets is detailed in ESD-263.

The inspector concludes that, while the NSC finding is factual, the finding is of minimal safety significance, because adequate corporate audits had been performed using checklists and subsequent audits, both internal and corporate, indicate that no fundamental QA program breakdown occurred as a result of the inadequately described internal auditing

program. (The Pullman internal audit program is further discussed in paragraph no. 9 of this report).

No items of noncompliance or deviations were identified.

44. Conclusion

The NSC audit contains a total of 175 documented findings, of which 110 were findings of apparent discrepancies or program weakness by NSC.

The NRC has completed an examination of 50 of the NSC findings identified as apparent weaknesses or discrepancies. The criteria used to select those findings for NRC examination are provided in paragraph 4 of this report. Of the 50 findings examined by the NRC, three of these were examined prior to this inspection and are documented in NRC Inspection Report No. 50-275/83-34.

Although, the NRC has identified a potential violation (paragraph 17) during this inspection, regarding the qualification of Pullman visual welding inspectors, this item is of reduced significance since all but two of the inspectors had adequate backgrounds and experience in the areas of welding or quality control inspection. It does not appear that this problem was chronic or widespread.

It is the staff's opinion that the NSC audit findings do not provide a basis for concluding that the Pullman-Kellogg Quality Assurance Program suffered a major breakdown during the time period prior to the NSC audit. Furthermore, based on this significant sample of the most important NSC findings it is concluded that examination of the remaining items is not warranted.

45. Management Meeting

On November 18, 1983, the inspectors met with licensee representatives denoted in paragraph 1. The inspection scope, observations, and findings were discussed. The licensee acknowledged the potential item of noncompliance identified in paragraph 17.

Parameter, Inc.

CONSULTING ENGINEERS
ELM GROVE, WISCONSIN

Report No. PAR(DCNP)-NDE-2

Page 1 of 3

November 22, 1983

Subject

1. Independent delta-ferrite measurements on 25 selected stainless steel welds to verify compliance with Code and Regulatory Guide 1.31 requirements.
2. Visual and liquid penetrant examination of field welds FW110-111-112 in isometric package 2-14-31.
3. Examination of radiographs of 102 weld joints for compliance with Code, verification of adequacy of reader sheets and evaluation of overall quality of radiographs.

References

1. Outline of nondestructive examination work to be performed at Diablo Canyon, November 14-18, 1983 by NRC contract personnel (Exhibit 1).
2. Contract No. NRC-05-82-249
Task Order No. 56
3. PAR: NRC/IE-82/83

Writer of Report

Kenneth A. Ristau, PARAMETER, Inc., NDT Level III, MT, PT, RT and UT

Contract Personnel Assigned

Daniel J. Hunt, Wisconsin Industrial Testing, Inc.,
Level II, MT, PT, UT

Introduction

The NRC outline of work (Exhibit 1) designates 3 welds to be liquid penetrant tested and visually examined.

The 25 stainless pipe welds to be tested for delta-ferrite measurements were designated by Mr. Dennis Kirsch, NRC Section Chief. For a list of the welds and results of the inspection, see WIT report (Exhibit 3). Also see WIT report for results of visual and penetrant inspection (Exhibit 4).

Mr. Kirsch also indicated the 102 welds of which radiographs were to be viewed (Exhibit 2).

Record of Activities

November 15 and 16 inspections were made by Dan Hunt and films were viewed by Ken Ristan.

In a short meeting with Dennis Kirsch, day end November 16, the results of our findings were conveyed verbally, as follows:

1. The delta-ferrite measurements met the NRC requirements.
2. The LPT of all three welds were approved but FW111 had one LP indication running transverse to the weld in the base material of the pipe. It was approximately 1/2" away from the weld and about 1" long.
3. The radiographs of the welds were viewed and approved as adequately meeting Code. Comments were also made by the writer concerning film quality, detail of reader sheet documentation and the excellent condition of the radiographs, nearly 10 years after x-ray date.

Conclusions

1. Having reviewed the radiographs and reader sheets of all 102 selected piping welds identified in Exhibit 2, the writer found reader sheet documentation detailed and clear. Radiographs were readily available, in good order and of very good quality. Radiographs are approved as meeting the requirements of applicable Codes.
2. All 25 welds selected for delta-ferrite measurements met the requirements of Code and Regulatory Guide 1.31 (See Exhibit 3).
3. Visual and liquid penetrant examination of FW110 and 112 were acceptable. FW111 weld was also acceptable but an liquid penetrant indication was noted in the pipe base material (See WIT Penetrant Report, Exhibit 4).

List of Exhibits

1. Outline of NonDestructive Examination Work to be Performed at Diablo Canyon, November 14-18, 1983, by NRC Contract Personnel.
2. Field Welds Chosen for Radiograph and Reader Sheet Review.
3. Delta-Ferrite Measurements.
4. Visual and Liquid Penetrant Examinations.

Prepared by:

Kenneth A. Ristau
Kenneth A. Ristau, Level III

Reviewed by:

Walter J. Foley
Walter J. Foley, Q/A Engineer

November 8, 1983

OUTLINE OF NON-DESTRUCTIVE EXAMINATION WORK TO BE PERFORMED AT
DIABLO CANYON, NOVEMBER 14-18, 1983, BY NRC CONTRACT PERSONNEL

GENERAL INFORMATION:

Location: Diablo Canyon Nuclear Plant, Unit Nos. 1 and 2
San Luis Obispo, California

Licensee: Pacific Gas and Electric Company
Docket No. 50-275 and 50-323

- Purpose:
1. Perform independent delta-ferrite measurements on about 25 selected stainless steel welds to verify compliance with code and Regulatory Guide 1.31 requirements.
 2. Visually examine and perform liquid penetrant examination of field welds FW-110, 111, 112 in isometric package 2-14-31.
 3. Examine about 100 weld radiographs and verify reader sheet, radiograph and evaluation adequacy.

Site Contact: Mr. Marvin Mendonca, NRC Senior Resident Inspector
805-595-2353

RV Contact: Mr. Dennis Kirsch, NRC Section Chief, 415-943-3740

Work Hours: 0730-1630, November 14-18, 1983

REQUIREMENTS:

To be furnished at the Diablo Canyon Site by the licensee:

- Hard hats and safety glasses
- Insulation removal
- Scaffolding erection
- Escorts to locate welds in the plant
- Assistance to assemble documentation (radiographs)
- Electrical power and extension cords for portable test equipment
- Working space for one or two persons to examine radiography records
- Viewer to examine radiographs
- Use of lunchroom and sanitary facilities
- Use of Xerox machine as back-up
- Calibrated severn gauge

To be furnished at the Diablo Canyon Site by the NRC:

- Assistance as required by the Senior Resident Inspector
- Telephones in the NRC trailer
- Xerox machine for copying

-2-

To be furnished by the contractor:

Certified level II or III liquid penetrant and qualified radiograph interpreter examiner to conduct visual and liquid penetrant examinations and an examination of about 100 radiographs for adequacy. Two copies of certifications and qualifications of all contractor personnel, and documentation verifying certification and qualification of liquid penetrant cleaner, penetrant and developer used shall be given to the NRC contact upon arrival at the Diablo Canyon Site. Measurements performed shall be in accordance with the latest editions of the ASME code. Two copies of all data sheets will be furnished to the NRC contact at the conclusion of the work.

A letter report including a description of the work performed, the data obtained or examined, and evaluation of the adequacy of licensee's documentation shall be prepared and delivered to the NRC Region V office by November 25, 1983. An exit meeting will be held with the NRC contact at the conclusion of the work to discuss the scope and findings.

Field Welds Chosen for Radiograph
 and Reader Sheet Review

<u>ISO Drawing</u>	<u>Field Weld</u>	<u>ISO Drawing</u>	<u>Field Weld</u>	<u>ISO Drawing</u>	<u>Field Weld</u>	<u>ISO Drawing</u>	<u>Field Weld</u>
1-7-21	100	1-7-6	31A	1-7-1	215	1-07-22	106
1-7-21	101	1-7-6	32	1-10-19	144	1-07-22	107
1-7-21	105	1-7-6	33	1-9-34	216	1-07-22	108
1-7-18	80	1-7-6	282	1-7-24	124	1-07-22	109
1-7-18	81	1-7-6	280	1-7-24	126	1-10-9	83 ^{K1}
1-7-14	62	1-7-6	283	1-9-42	249	1-07-22	110
1-7-14	63	1-7-9	294	1-9-42	245	1-07-22	111
1-7-14	64	1-7-9	284	1-9-42	250	1-07-22	112
1-7-10	46	1-7-9	182	1-7-8	242	1-07-22	113
1-7-2	7	1-7-9	43	1-7-8	40	1-09-9	75
1-7-5	22	1-7-9	42A	1-12-8	100	1-09-9	73
1-7-5	23	1-7-9	42	1-12-8	103	1-09-9	72
1-7-5	24	1-8-323	1084	1-12-8	99	1-09-9	74
1-7-5	25	1-7-1	1	1-12-8	104	1-09-9	71
1-7-5	26	1-7-1	2	1-7-23	117	1-09-9	77
1-7-5	27	1-7-1	3	1-09-41	242	1-09-9	78
1-7-5	295	1-7-1	4	1-09-41	243	1-07-17	76
501014	362	1-7-1	201	1-09-41	244	1-07-17	77
1-8-321	1069	1-7-1	203	1-09-17	130	1-07-17	78
1-7-28	186	1-7-1	204	1-09-17	131	1-07-17	79
1-7-28	187	1-7-1	206	1-09-17	132	1-07-16	72
1-4-153	1428	1-7-1	207	1-09-38	230	1-07-16	73
1-4-153	1060	1-7-1	209	1-09-28	231	1-07-16	74
500136	251	1-7-1	211	1-09-38	232	1-07-16	75
1-7-6	28	1-7-1	213	1-09-38	233	1-07-19	82
						1-07-19	83
						1-07-19	84

... AUDIT PERFORMED BY DANIEL HUNT (PARAMETER) 11-16-83

FERRITE INDICATOR $\frac{5}{8}$ " N 2947, CAL.

DATE 3-9-83

ISO NUMBER	FW NUMBER	FERRITE READING
1-8-328	1117	> 7.5% < 10%
1-8-328	1125	> 7.5% < 10%
1-8-328	1124	> 7.5% < 10%
1-8-328	1122	> 7.5% < 10%
1-8-328	1119	> 7.5% < 10%
1-8-328	1118A	> 7.5% < 10%
1-8-328	1118	> 7.5% < 10%
1-8-320	1060	> 7.5% < 10%
1-8-320	1059	> 7.5% < 10%
1-8-320	1057	> 7.5% < 10%
1-8-20	293	> 7.5% < 10%
1-8-20	293A	> 7.5% < 10%
1-8-20	293B	> 7.5% < 10%
1-8-20	150	> 10% < 15%
1-8-20	149	> 10% < 15%
1-8-20	148	> 10% < 15%
1-8-20	147	> 10% < 15%
1-8-20	145	> 7.5% < 10%
1-8-20	146	> 7.5% < 10%
1-8-2	16	> 7.5% < 10%
1-8-2	20	> 7.5% < 10%
1-8-2	21	> 7.5% < 10%
1-8-2	22	> 7.5% < 10%
1-8-2	24	> 7.5% < 10%
1-8-2	19	> 7.5% < 10%

Daniel Hunt

WISCONSIN INDUSTRIAL TESTING, INC.

4750 N. 17th Street • Brookfield, WI 53005 • Tel (414) 781-0105
 899 E. Main • Sheboygan, WI 53081 • Tel (414) 722-3115
 FAA Repair Station C13 29

REPORT OF
 NONDESTRUCTIVE
 EXAMINATION
 (UT, MT, PT, ET)

Attachment 1

Order # 1110 C	Location DREXCO CANYON, CALIF.	Contract No.	Date 11-16-83
No.	Item Description SEAM PIPE	Plan or Drawing No. 150 2-14-31	Control Report No.
System # FW-110, 111, 112	Material #	Material #	Surface Condition AS WELDED
Exam. Method T D U T D M T D P T B	Examination Standard	Acceptance Standard ASME II NBCC	Mill Process
Work Order # Repair D R#	Total Length Examined 100% WELD	Material Type STAINLESS STEEL	Material Thickness
Equipment	Probe	Test Block	Technique Description
Equipment	Transducer	Test Block	Technique Description
Equipment	Dry <input type="checkbox"/> Visible <input type="checkbox"/> AC <input type="checkbox"/> DC <input type="checkbox"/> Wet <input type="checkbox"/> Fluor <input type="checkbox"/> Rectified <input type="checkbox"/>	Ampage	Prod spacing Head <input type="checkbox"/> Coil <input type="checkbox"/>
Equipment	Visible <input checked="" type="checkbox"/> Fluorescent <input type="checkbox"/>	Penetrant Dwell Time 20 MIN	Development Time 7 MIN

C = Crack P = Porosity LF = Lack of Fusion LI = Linear Indication S = Slag LA = Lamination

PART NO.	ACC.	REJ.	DEFECT CODE	REMARKS	PART NO.	ACC.	REJ.	DEFECT CODE	REMARKS
11-110	/								
11-111	/		LAP	3/4" IRON WELD 1" LONG.					
11-112	/								

CLEANER: SKC-5
 PENETRANT: SKL-5/SKL-HF
 DEVELOPER: SKD-5

Location THREED ON PIPE	Number of Items Accepted	Number of Items Rejected
Technician James J. Hunt II Cert Level	Date 11-16-83	Customer
Technician	Authorized Inspector	Date

WISCONSIN INDUSTRIAL TESTING, INC. the Contractor will use reasonable effort to assist the client in the... of accuracy and to locate or measure discontinuities or... of the... which is usually... of... The Contractor... that the parts being... in compliance with the specifications... of the...

... as to the... and... of such tests is not... to... the... Contractor... of such... Contractor... to... for... of... shall... of... of... of... of... of...

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

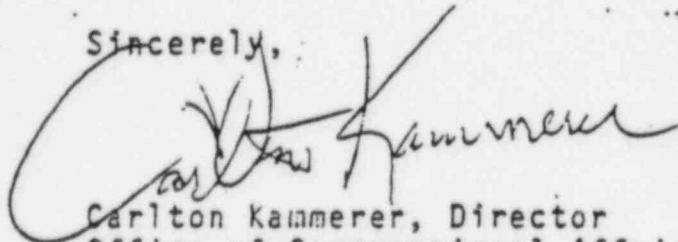
June 13, 1984

Dr. Henry Myers, Science Advisor
Subcommittee on Energy and the Environment
Committee on Interior and Insular Affairs
United States House of Representatives
Washington, D.C. 20515

Dear Dr. Myers:

I am enclosing the NRC Staff responses to questions and issues raised in your March 22 and 26, 1984 and April 10, 1984 memoranda on Diablo Canyon.

Sincerely,



Carlton Kammerer, Director
Office of Congressional Affairs

Enclosures:
As stated

cc: Thomas Weimer

BACKGROUND:

DR. MYER'S QUESTIONS (DATED 4/10/84) WERE FIRST RECEIVED ON APRIL 11, 1984, SHORTLY BEFORE THE COMMISSION MEETING REGARDING DIABLO CANYON UNIT 1 LOW POWER TESTING. A LICENSING BOARD NOTIFICATION WAS MADE ON APRIL 12, 1984. MOST OF THE TOPICS REFERENCED BY THE QUESTIONS WERE DISCUSSED IN THE COMMISSION MEETING ON APRIL 13, 1984. DURING THAT MEETING THE TOPICS WERE ADDRESSED BOTH BY THE STAFF AND THE LICENSEE. IN ADDITION, THE LICENSEE HAD PREVIOUSLY SUBMITTED MATERIAL TO THE ATOMIC SAFETY AND LICENSING BOARD (IN 1983) WHICH RELATES TO THESE TOPICS.

NRC STAFF EXAMINATION OF THE NSC AUDIT, AND RELATED ACTIONS, WAS PERFORMED PRIMARILY TO PROVIDE THE NEW NRC REGIONAL ADMINISTRATOR INSIGHT INTO THE MANAGEMENT AND QUALITY PRACTICES EMPLOYED IN THE EARLY CONSTRUCTION OF DIABLO CANYON. EXAMINATION OF THE NSC AUDIT PROVIDED THE VEHICLE. THE STAFF FOLLOWED THE PATH REPORTED BY THE NSC AUDIT, APPROPRIATELY EXPANDING UPON AREAS OF QUESTION, TO DETERMINE THE VALIDITY OF THE NSC FINDINGS. THE NRC STAFF DID NOT PERFORM A COMPLETE RECONSTRUCTION OF ALL PULLMAN POWER CONSTRUCTION ACTIVITIES AT THE SITE OVER THE YEARS. BASED UPON THE STAFF'S FINDINGS RELATING TO THE NSC AUDIT, A RECONSTRUCTION OF THIS TYPE IS NOT WARRANTED, AND IS NOT CONSIDERED TO BE AN APPROPRIATE EXPENDITURE OF NRC STAFF RESOURCES. CERTAIN ASPECTS OF THE QUESTIONS LISTED BELOW CANNOT BE SPECIFICALLY ANSWERED SINCE TOTAL RECONSTRUCTION OF ALL ASPECTS WAS NOT PERFORMED, AND, AS STATED, IT DOES NOT APPEAR THAT FURTHER EFFORTS IN THIS AREA ARE MERITED.

QUESTION 1:

THE NSC AUDIT OF PULLMAN APPEARS TO HAVE BEEN UNDERTAKEN IN RESPONSE TO CONCERNS EXPRESSED BY PG&E AS TO WHETHER THE DIABLO REACTORS HAD BEEN CONSTRUCTED IN A MANNER THAT COMPLIED WITH THE COMMISSION'S REGULATIONS. PG&E AUDIT 80422 (P. 2) STATES: "SEVERAL APPARENTLY GENERIC DEFICIENCIES IN WORK PERFORMED BY PULLMAN WERE PREVIOUSLY IDENTIFIED BY THE GENERAL CONSTRUCTION DEPARTMENT."

WHAT "GENERIC DEFICIENCIES" HAD BEEN IDENTIFIED BY THE GENERAL CONSTRUCTION DEPARTMENT?

HAD THESE "GENERIC DEFICIENCIES" BEEN REPORTED TO THE AEC/NRC?

ANSWER 1:

AS DISCUSSED IN THE APRIL 13, 1984, COMMISSION MEETING TRANSCRIPT, THE LICENSEE PERFORMED ITS AUDIT (NO. 80422) TO SAMPLE THE ADEQUACY OF HARDWARE AND OBTAIN AN ASSESSMENT OF PULLMAN ACTIVITIES DUE TO THE (APPARENTLY) IMPENDING LICENSING OF THE PLANT. THE BEST THAT THE STAFF WAS ABLE TO RECONSTRUCT REGARDING THE "GENERIC DEFICIENCIES" (REFERED TO IN AUDIT 80422) RELATE PRIMARILY TO TWO SPECIFIC PROBLEMS AND A MORE GENERALIZED PROBLEM WITH REWORK. THE STAFF HAD BEEN INFORMED OF THESE PROBLEMS.

THE FIRST SPECIFIC PROBLEM RELATED TO DEFICIENCIES IN ANCHOR BOLT INSTALLATIONS WAS DETECTED IN EARLY 1977. EXTENSIVE RESEARCH, TESTING, AND REWORK WAS ASSOCIATED WITH THIS ISSUE TO IMPROVE CONTROLS FOR INSTALLING AND

INSPECTING ANCHOR BOLTS. THE NRC STAFF WAS INFORMED OF THIS PROBLEM. IN FACT, MUCH OF THE WORK DONE IN THIS AREA WAS UTILIZED BY THE STAFF IN MAKING ASSESSMENTS OF ANCHOR BOLT ADEQUACY AT OTHER FACILITIES, IN THAT, THESE PROBLEMS WERE FOUND TO BE SOMEWHAT GENERIC IN THE INDUSTRY. THESE FINDINGS PROVIDED A BASIS FOR THE ISSUANCE OF IE BULLETIN 79-02. THE SECOND SPECIFIC PROBLEM RELATED TO UNDERSIZED SOCKET WELDS ON SCHEDULE 160 PIPING. DEFICIENCIES IN THIS AREA LED TO THE REINSPECTION OF ALL SCHEDULE 160 SOCKET WELDS AND THE ADDITION OF WELDMENT TO THOSE WHICH WERE FOUND TO BE UNDERSIZED.

IN 1977, THE LICENSEE ALSO NOTED THAT THE VOLUME OF REWORK BY THE PULLMAN CONTRACTOR WAS INCREASED OVER PREVIOUS PERIODS. THIS INCLUDED NOT ONLY ANCHOR BOLTS, AND SOCKET WELDS, BUT ALSO REWORK RELATED TO RADIOGRAPHS.

QUESTION 2:

THE SCOPE STATEMENT OF THE NSC AUDIT ENCOMPASSED "WORKMANSHIP OF THE FIELD-FABRICATED AND INSTALLED ITEMS." THE JUNE 16, 1978 LETTER FROM MR. WISCHOW TO MR. BAIN, TO WHICH THE PG&E REVIEW OF THE NSC AUDIT AND PULLMAN RESPONSE THERETO WERE ATTACHED, STATED THAT THE NSC AUDIT "DID NOT ADDRESS ITSELF TO THE VERIFICATION OF THE ADEQUACY OF THE INSTALLED HARDWARE. THE NSC AUDIT WAS SUPERFICIAL WITH RESPECT TO THE HARDWARE...."

DID NSC FULFILL ITS COMMITMENT TO VERIFY THE ADEQUACY OF INSTALLED HARDWARE? IF NOT, WHAT WAS THE REASON FOR ITS NOT HAVING DONE SO? WHAT WAS DONE TO SATISFY PG&E'S ORIGINAL CONCERN THAT THERE BE AN AUDIT TO VERIFY THE ADEQUACY OF INSTALLED HARDWARE?

ANSWER 2:

BASED ON OUR REVIEW OF THE SCOPE OF WORK ASSIGNED TO NSC, IT CLEARLY LOOKS AS IF NSC SHOULD HAVE FOCUSED ON INSTALLED HARDWARE. AS EVIDENCED BY THE NSC REPORT THE VAST MAJORITY OF THE NSC EFFORT FOCUSED ON THE "PAPER-TRAIL" ASSOCIATED WITH THE WORK, AND NOT THE WORK ITSELF. AS MENTIONED PREVIOUSLY, THE STAFF DID NOT PERFORM A COMPLETE RECONSTRUCTION OF ALL NSC ACTIONS. THE STAFF DOES NOT KNOW THE PRECISE REASONS NSC DID NOT DIRECT THEIR AUDIT TOWARD HARDWARE. RECONSTRUCTION WOULD BE LARGELY SPECULATIVE. NEVERTHELESS, THE LICENSEE FELT THAT A DIRECT HARDWARE AUDIT SHOULD BE PERFORMED. THE LICENSEE FIRST REQUESTED THAT PULLMAN PERFORM SUCH AN AUDIT AS A PART OF THE FOLLOWUP TO THE NSC AUDIT. THIS FOLLOWUP HARDWARE AUDIT WAS PERFORMED BY A SINGLE INDIVIDUAL. LICENSEE OVERVIEW OF THIS ACTIVITY CONCLUDED THAT THIS AUDIT WAS DEFICIENT. ACCORDINGLY, THE LICENSEE DIRECTED THAT PULLMAN PERFORM A MORE EXTENSIVE, IN-DEPTH AUDIT OF HARDWARE. THIS AUDIT (NO. 71-77-3-78) WAS SATISFACTORILY PERFORMED IN JULY 1978, AND IDENTIFIED 43 ITEMS WHICH WERE APPROPRIATELY ADDRESSED AND RESOLVED TO THE LICENSEE'S SATISFACTION.

QUESTIONS 3:

PG&E UNDERTOOK AUDIT 80422 TO VERIFY THE ADEQUACY OF PULLMAN'S QA PROGRAM; TO REVIEW THE VALIDITY OF THE NSC FINDINGS AND TO DETERMINE THE ACCURACY AND APPROPRIATENESS OF PULLMAN'S RESPONSE; AND TO OBSERVE THE AS-INSTALLED CONDITION OF COMPONENTS AND PULLMAN'S ADHERENCE TO APPLICABLE SPECIFICATIONS, DESIGN DRAWINGS, AND QUALITY STANDARDS.

AUDIT 80422 EVALUATED A PULLMAN CORPORATE AUDIT CONDUCTED IN FEBRUARY 1978. AUDIT 80422 FOUND DISCREPANCIES IN ITEMS THAT HAD BEEN INSPECTED BY PULLMAN AUDITORS WHO NOTED NO DISCREPANCIES. AUDIT 80422 CONCLUDED THAT "IN LIGHT OF THE NUMBER OF DISCREPANCIES NOTED, IT IS APPARENT THAT THE PULLMAN AUDIT DID NOT EFFECTIVELY EVALUATE THE QUALITY OF THEIR WORK."

WAS ANY ADDITIONAL AUDITS WERE CONDUCTED IN LIGHT OF THE FINDING THAT PULLMAN'S "AUDIT DID NOT EFFECTIVELY EVALUATE THE QUALITY OF THEIR WORK?" IN LIGHT OF THIS FINDING WHAT HARDWARE INSPECTIONS WERE CONDUCTED TO DETERMINE THE ADEQUACY OF PULLMAN'S WORK? HOW MANY DISCREPANCIES WERE NOTED AS THE RESULT OF ADDITIONAL AUDITS AND INSPECTIONS CONDUCTED IN THE WAKE OF AUDIT 80422? WHAT WAS DONE TO DETERMINE WHY THE DEFICIENT CONDITIONS NOTED IN M-3725 AND M-3726 HAD NOT BEEN DISCOVERED IN THE COURSE OF THE ORIGINAL INSPECTION PROCESS? WHAT WAS THE REASON THESE DEFICIENT CONDITIONS HAD NOT BEEN NOTED DURING THE COURSE OF THE ORIGINAL INSPECTION PROCESS? WHAT WAS DONE TO DETERMINE WHY THE PULLMAN CORPORATE AUDIT HAD NOT NOTED THE DISCREPANCIES NOTED BY AUDIT 80422? WHY DID THE PULLMAN CORPORATE AUDIT NOT DISCOVER THE DISCREPANCIES? WHAT WAS THE BASIS FOR THE 83-37 FINDING (STATED ON PAGE 40) THAT PULLMAN HAD PERFORMED ADEQUATE CORPORATE AUDITS? WHAT WAS THE BASIS FOR THE 83-37 FINDING (1D.) THAT PULLMAN'S INTERNAL AND CORPORATE AUDITS HAD INDICATED THAT NO FUNDAMENTAL QA PROGRAM BREAKDOWN HAD OCCURRED? [E.G. SEE 1978-79 FINDINGS RE PIPE RUPTURE RESTRAINTS PER NCR'S DC1-78-RM-008, DC1-78-RM-009, DC1-79-RM-003, ETC.]

ANSWER 3:

AS STATED IN RESPONSE TO QUESTION 2, ABOVE, THE LICENSEE PROPERLY DETERMINED THAT PULLMAN'S INITIAL AUDIT WAS DEFICIENT. THIS WAS A SECOND FALSE START (THE FIRST BEING NSC'S FAILURE TO FOCUS ON THE HARDWARE). THE UTILITY THEN TOOK ACTION WITH PULLMAN TO GET A THOROUGH HARDWARE AUDIT. THIS PULLMAN AUDIT (NO. 71-77-3-78) ACCOMPLISHED THE LICENSEE'S GOAL. PULLMAN IDENTIFIED 43 ITEMS IN THEIR AUDIT.

THE KINDS OF DEFICIENCIES FOUND BY THE LICENSEE (IN M-3725 AND M-3726) AND THE PULLMAN AUDIT WERE MOSTLY MINOR IN NATURE AND NOT ATYPICAL OF WHAT IS FOUND ELSEWHERE. IT IS NOT POSSIBLE TO ACCURATELY STATE AT THIS LATE DATE, WHY THE FIRST LINE QC INSPECTORS DID NOT DETECT THESE ANOMALIES. COMMENT ON WHY THE PULLMAN INITIAL AUDIT WAS INADEQUATE WOULD BE LARGELY SPECULATIVE. THE AUDIT WAS CONDUCTED BY A SINGLE AUDITOR. WHAT IS IMPORTANT IS THAT PG&E RECOGNIZED THE PROBLEM, TOOK FORCEFUL ACTION WITH PULLMAN MANAGEMENT, AND A MEANINGFUL HARDWARE AUDIT WAS OBTAINED.

AS INDICATED, THE FINDINGS FROM THE LICENSEE AND PULLMAN AUDITS WERE NOT OF THE SIGNIFICANCE THAT WOULD INDICATE A FUNDAMENTAL QUALITY ASSURANCE PROGRAM BREAKDOWN. AND, AS STATED IN STAFF REPORT 83-37, THE COMBINATION OF PULLMAN CORPORATE AND INTERNAL AUDITS PROVIDED ADEQUATE AUDIT COVERAGE TO MEET THE REQUIREMENTS OF 10 CFR 50, APPENDIX B.

QUESTION 4:

TO WHAT EXTENT DID RECOMMENDATIONS LISTED ON PAGE 11 - 12 OF AUDIT 20422 CORRESPOND TO DEFICIENCIES NOTED IN THE NSC AUDIT?

ANSWER 4:

WHILE THERE IS SOME COMMONALITY IN GENERAL SUBJECT MATTER (E.G., THE GENERAL TOPICS OF INSPECTORS' CERTIFICATION AND REFERENCE TO PROCEDURE KFPS-7) THE LICENSEE'S RECOMMENDATIONS ON PAGES 11 AND 12 OF AUDIT 80422 DO NOT HAVE A ONE FOR ONE CORRELATION TO THE NSC FINDINGS. THE NSC AUDIT RELATED PRIMARILY TO PAPER WORK WHILE THE LICENSEE'S AUDIT INCLUDED HARDWARE INSPECTIONS.

QUESTIONS 5:

A MAY 29, 1979 MEMORANDUM FROM K. FREED TO E. GERWIN ADDRESSES PIPE RUPTURE RESTRAINT PROBLEMS. WHY HAD WELDER DEFICIENCIES NOT BEEN DETECTED AND CORRECTED AT AN EARLIER DATE BY PULLMAN'S QC/QA PROGRAM? TO WHAT EXTENT ARE THE NOTED WELDING DEFICIENCIES SIMILAR TO THOSE SPECIFIED BY THE NSC AUDIT?

ANSWER 5:

THERE APPEARS TO BE SOME CONFUSION ABOUT THE SIGNIFICANCE OF THE MAY 29, 1979 MEMO. THE PROBLEM WHICH IT DISCUSSES WAS DETECTED MUCH EARLIER THAN THE DATE OF THE MEMO. THE LICENSEE AND PULLMAN HAD PROPERLY DOCUMENTED THE PROBLEM THROUGH THE QC/QA SYSTEM, AND HAD BEEN EVALUATING THE EXTENT OF THE PROBLEM FOR SEVERAL MONTHS. IT WAS OFFICIALLY REPORTED TO THE NRC AS A 50.55(E) DEFICIENCY ON APRIL 4, 1979. THE MAY 29, 1979 MEMO WAS AN INTERNAL PULLMAN DOCUMENT ADDRESSED TO THE PULLMAN QA MANAGER. IT REPRESENTED AN EARLY ATTEMPT BY PULLMAN TO ASSESS THE CAUSES OF THE PROBLEM. THE MEMO WAS SOMEWHAT PREMATURE IN THIS REGARD SINCE THE LICENSEE WAS CONDUCTING EXTENSIVE EVALUATIONS WHICH LASTED OVER AN EXTENDED PERIOD. THESE EVALUATIONS INCLUDED: NONDESTRUCTIVE

EXAMINATIONS; EXAMINATION OF WELD RECORDS; DESTRUCTIVE TESTING; AND FAILURE MODE DETERMINATION. A FINAL REPORT ON THIS SUBJECT WAS ISSUED TO THE NRC IN DECEMBER 1980. THIS TOPIC WAS HEAVILY INSPECTED BY THE NRC STAFF AND IS ADDRESSED IN SIX STAFF INSPECTION REPORTS.

THE ANALYSIS OF THE PROBLEMS DISCLOSED THAT THE CAUSES WERE COMPLEX AND UNIQUE TO THE TYPE OF WELDING BEING PERFORMED. THE RUPTURE RESTRAINT SITUATION WAS UNIQUE IN THAT THE COMPONENTS INVOLVE HIGH STRENGTH MATERIALS, VERY THICK WELD SECTIONS, AND HIGHLY RESTRAINED JOINT CONFIGURATIONS, NOT NORMALLY FOUND IN NUCLEAR PLANTS. THE COMPONENT FAILURES WERE FIRST DETECTED AS LAMELLAR TEARS OUTSIDE OF THE WELDS THEMSELVES. THE ORIGINAL INSPECTION PROCESS SPECIFIED FOR THESE WELDS DID NOT ANTICIPATE THIS TYPE OF FAILURE AND WAS NOT SUITABLE FOR THEIR DETECTION. THEREFORE, EVEN THOUGH THE QC INSPECTORS PERFORMED THEIR INSPECTIONS PROPERLY THEY WERE NOT ABLE TO DETECT THE FLAWS DUE TO THE INSPECTION TECHNIQUE SPECIFIED. THE PROBLEM WAS ULTIMATELY IDENTIFIED WHEN PERFORMING ROUTINE REPAIRS TO THE RESTRAINTS. A SUITABLE NONDESTRUCTIVE EXAMINATION METHOD WAS SPECIFIED AND APPLIED AS A PART OF THE CORRECTIVE ACTION PROGRAM.

THE CONDITIONS RELATED TO THE RESTRAINTS ARE QUITE DIFFERENT THAN THOSE ADDRESSED BY THE NSC AUDIT (WHICH FOCUSED ON PAPERWORK RELATED TO PIPE AND PIPE SUPPORT WELDING). REFER TO QUESTION 6 FOR ADDITIONAL DISCUSSION IN THIS AREA.

QUESTION 6:

WHAT AUDITS AND/OR REINSPECTIONS OF HANGERS WERE CONDUCTED TO DETERMINE WHETHER THE TYPES OF DEFECTS FOUND IN THE PIPE RUPTURE RESTRAINTS EXISTED WITH RESPECT TO PIPE HANGERS? WHAT IS THE BASIS FOR A DETERMINATION THAT DEFECTS FOUND IN PIPE RUPTURE RESTRAINTS DID NOT EXIST WITH RESPECT TO PIPE HANGERS?

ANSWER 6:

THE PROBLEMS ASSOCIATED WITH RUPTURE RESTRAINT FABRICATION WERE FOUND TO BE DUE PRIMARILY TO THE USE OF HIGH STRENGTH STEEL, IN HEAVY THICK SECTIONS, WITH RESTRAINED JOINT CONFIGURATIONS. THESE ARE NOT THE TYPE OF CONDITIONS ENCOUNTERED IN PIPE HANGER FABRICATION, WHICH TYPICALLY INVOLVES MILD STEEL, SMALLER MATERIAL SECTIONS, WITH LESS CONCERN WITH RESTRAINED JOINT CONFIGURATIONS. SINCE THE PROBLEMS ASSOCIATED WITH THE FABRICATION OF THE HEAVY RESTRAINTS WERE NOT APPLICABLE TO PIPE HANGERS THERE WERE NO SPECIFIC AUDITS OR REINSPECTIONS PERFORMED RELATIVE TO THIS TOPIC. HOWEVER, FOR OTHER REASONS (SUCH AS IE BULLETIN 79-14) THERE WERE REINSPECTIONS OF PIPE HANGERS.

1. Question

"GC-1. A statement to the following effect is made repeatedly with respect to the Region V method used to inquire into the NSC findings: "The inspector's approach to resolving this issue was to assess the validity of the NSC finding and Pullman response, and evaluate the NRC findings for conformance with the specified Pullman program." (E.g. 83-37, Item 24.) This implies that there is a documented Pullman response to the NSC finding. (E.g. "The licensee conducted an audit of Pullman, during the period of April 2 through June 1, 1978, in response to the NSC audit and the Pullman response." See Draft 83-37, p. 37. This statement does not appear in the Final 83-37.) Where is the Pullman response? What interviews were conducted with PG&E, Pullman, and NSC past and present personnel in the course of preparing 83-37? How were such interviews documented? Where is the documentation?"

Answer

The Pullman response to the NSC audit report was submitted to PG&E by Pullman on April 11, 1978. This response was formally submitted to the Atomic Safety and Licensing Appeals Board by PG&E as an attachment to the Affidavit of Russell P. Wischow, dated September 21, 1983.

To better understand the response to this question, and those which follow, some background may be helpful.

On September 9, 1983, a filing to the Diablo Canyon Atomic Safety and Licensing Appeals Board was made by "Joint Interveners" which included an audit of the Pullman Power Products (PPP) quality assurance program performed by Nuclear Services Corporation (NSC) and reported on October 24, 1977. The Pullman and Pacific Gas and Electric responses to the NSC audit were dated April 11, 1978 and June 16, 1978, respectively.

One of the significant aspects of the NSC audit was that it was almost exclusively limited to a records and paperwork review as opposed to a hardware or personnel performance review.

The NSC report contained many critical findings and drew far reaching conclusions. Both the Pullman and the PG&E responses took issue with many of the findings and conclusions of the NSC report. Our review of our own inspection reports over the years did not seem to corroborate many of the NSC conclusions.

The Region V Administrator elected to approach this inconsistency by examining, in depth, a large sample of the most significant NSC findings and the associated Pullman and PG&E responses to determine whether the NSC conclusions and findings could reasonably be drawn from the QA records which NSC reviewed. The Region V examination was limited to this sample and did not constitute a comprehensive reconstruction of the entire Pullman activity at Diablo Canyon. Consistent with this logic, our inspection did not rely, in any appreciable way, on personnel interviews; consequently no transcripts, tapes, etc., were made. Summary sheets do exist in our inspection file for three discussions involving five individuals. These discussions did not contribute appreciably to

the NRC conclusions. The discussions are referred to in inspection report 83-37 in paragraphs 20 and 25.

In summary, as discussed in several Commission meetings and in Report 83-37, the inspection of the NSC report was limited to a sampling of the significant NSC findings to determine if they could be reasonably supported by QA records. The NSC audit was almost exclusively based on review of QA records. The NRC examination was similarly focused. Except as noted in Report 83-37, we found no reasonable basis to expand the limits of the review.

2. Question

"GC-2. Inspection Report 83-37 refers to corrective actions taken in response to the NSC audit. It is unclear in certain instances as to whether the corrective actions were taken with respect to QA deficiencies that existed prior to the audit; e.g. to what extent did the corrective actions involve activity to insure that inadequate workmanship did not escape detection as a consequence of the QA deficiencies that existed prior to the NSC audit."

Answer

It is difficult to address this comment in detail in the absence of specific examples of concern. However, a few general comments addressing this item may be made.

The vast majority of NSC findings involved some kind of paperwork; i.e. program, procedures or instructions rather than workmanship issues. In writing the report, and during the conduct of the inspection, the staff made every attempt to address and assess not only the adequacy of prospective work but also the degree of retroactive back-fitting that was appropriate. Therefore, the staff did consider the applicability of the NSC findings and Pullman responses to previous work.

The staff attempted to make clear that the majority of corrective actions taken as a result of the NSC report were programmatic improvements, or amplification of existing program descriptions, and did not necessarily condemn work performed prior to the improvement. In each case in the inspection report, the staff feels that, whenever a programmatic improvement was made subsequent to the NSC audit, the NRC made the finding that the program prior to the improvement was adequate or that no evidence was found to indicate that the program prior to the improvement resulted, or would likely have resulted, in an inadequate implementation condition. For example:

- a. In paragraph 8 of the report the following conclusion is stated "The inspector found the QA program elements describing hanger package review and weld preheat were adequate and met the applicable code requirements," even though programmatic improvements were effected subsequent to the NSC audit.
- b. In paragraph 15 of the report the following conclusion is stated "Furthermore, there is no evidence in the NSC, PG&E, and Pullman

corporate audits to suspect that any field changes made to pre-1977 documents and records impacted adversely on the quality of field construction," even though programmatic improvements were effected subsequent to the NSC audit.

In summary, during the conduct of the inspection the inspectors considered the effect on previous work during their examination of each item and programmatic improvement.

3. Question

"GC-3. Inspection Report 83-37 contains several references to the 90 day welders' log. Does the NRC have the log in its possession? If not, is it readily accessible? Where is it? What deficiencies exist in this log vis-a-vis the ASME code?"

Answer

The NRC does not have the 90 day welders' log in its possession. The log is readily accessible and stored in the Pullman QA records vault at the Diablo Canyon site.

The ASME Code does not mandate the use of a 90 day welders' log. The ASME Code only requires some sensible method of keeping track of welder qualification and welder activity. The 90 day welders' log is the mechanism adopted by Pullman, at Diablo Canyon, to track the welders, employed by Pullman, which were qualified during a particular time period. It has as its basis the original welder qualification record and the use of a particular process during a predefined previous period, as derived from the weld filler metal withdrawal slips. As discussed in paragraphs 9, 18, 19, 20 and 22 of Inspection Report 83-37, the staff found the Pullman system adequate in fulfilling the requirement of the ASME Code.

4. Question

"GC-4. Inspection Report 83-37 states in several places that Pullman practices were "consistent" with the ASME code. Does "consistent" mean "in compliance with"? Is it the NRC position that wherever "consistent" is used that it may be replaced by "in compliance with"?"

Answer

Yes, as used in inspection report 83-37.

5. Question

"GC-5. There is no indication of Region V having sought the views of NSC either to elaborate on the 1977 findings or to comment on the findings and conclusions of the Region V inquiry."

Answer

Region V has actively sought the views of NSC (now named Quadrex).

On two occasions the staff sought the views of the team leader (who is no longer associated with Quadrex) and of the President of Quadrex by telephone. In both cases they could not recall details. The details of these calls are contained in the transcripts of the Commission meetings of March 26, 1984 and April 13, 1984.

Further, Region V formally requested on April 4, 1984 that Quadrex review the NRC Inspection Report (Nos. 50-275/83-37 and EO-323/83-25) and extended the NRC invitation to appear at the Commission meeting on April 13, 1984.

The President of Quadrex responded by letter dated April 9, 1984 and indicated that he didn't believe Quadrex could add substantive information regarding the differences in the audits at this time.

The Commission again requested Quadrex to meet with them in a letter dated May 18, 1984, and they have agreed to meet.

6. Question

"GC-6. Page 3 of the draft states a sample of 25 stainless steel welds were sampled for delta ferrite and that 100 radiographs were selected to verify field weld and inspection review adequacy. What is the basis for selecting these welds? On what dates were these welds produced? Did these welds represent an adequate statistical sample?"

Answer

The basis for the sampling done was as stated in the report (83-37) on page 3 ... "to provide an independent feel for the Pullman work rather than solely relying on information provided by licensee records." In the instances cited (dealt with in paragraphs 25 and 33 of report 83-37) the inspector's conclusions were not dependent on the independent sampling. The sampling was not meant to be, nor was it advertised to be, statistically rigorous but was as stated in paragraph 25 "an additional check...."

7. Question

"Criterion I, NSC Audit Finding 3. (Final p.3, Draft, p.2-5.):

Did the fact of QA personnel writing and approving Engineering Specifications, performing welding engineering functions, and approving welding engineering changes constitute a violation of Appendix B requirements?"

Answer

No.

8. Question

"Criterion II, NSC Audit Finding 4. (Final p.4-5, Draft, p.2-5.):

Is it the NRC conclusion that upper management performed scheduled reviews of nonconformance reports, personnel qualifications, and corrective actions as required by NRC regulations for the time periods addressed by the NSC audit? Note handwritten notation in draft report: "In conclusion, factual records do not support the NSC finding." The corresponding statement in the final report is: "The inspector concludes the historical records of corporate management audits do provide evidence that reviews of nonconformance reports, personnel qualifications and corrective actions were performed." Note comment in final report: "In addition, Pullman Power Products has since proved programmatic improvements..." etc. What was the program prior to the improvements? What was it after the improvements were instituted?"

Answer

Yes, it is the NRC staff's conclusion that upper management did perform periodic reviews of nonconformance reports, personnel qualifications, and corrective actions as required by NRC regulations for the time periods addressed by the NSC audit. This was stated in paragraph 6 of inspection report 83-37.

It is important to keep in focus the purpose of the NRC inspection. As stated previously in answer to GC-1, that purpose did not include a diagnostic evaluation of the entire Pullman QA history. Accordingly, we did not compile a description of the Pullman program for each point of time in its evolution. In addition, the NRC inspection did not identify anything which would indicate a need for such a total reconstruction.

9. Question

"Criterion V, NSC Audit Finding 1. (Final p. 5, Draft, p. 39-40.):

NSC stated: "There is no requirement that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings." Region V states, apparently in reference to fabrication of piping assemblies and erection of pipe in the plant, that KFP-8 established appropriate instructions and procedures. Region V seems to imply that KFPS-7 established procedures for pipe supports. KFPS-7, however, was not issued until December 1973. Were the QA procedures for installation of pipe procedures prescribed by documented instruction, procedures etc. prior to December 1973? Moreover, the draft states that ESD-264, dated 9/15/78, provided a specific procedure "to implement precisely the QA program elements of KFP-8 and KFPS-7." The latter statement does not appear in the final report. In that the specific procedures for implementing "precisely the QA program elements of KFP-8 and KFPS-7" were apparently not promulgated until only September 15, 1978 what is the basis for assurance that KFP-8 and KFPS-7 were adequately implemented prior to September 1978."

Answer

A brief history of the Pullman QA program applicable to pipe supports would be helpful here. The first pipe support work began during August 1971 with work begun on the first non-safety related pipe support (August

5, 1971) and safety related pipe support (August 16, 1971). As a result of a PG&E QA audit, performed during late 1973, it was identified that Pullman did not have a QA program covering the installation of pipe supports and that the QA program for the installation of pressure boundary piping was not fully applicable to pipe support work. A stop work order was issued on pipe hanger/rupture restraint work until an approved QA program covering pipe support/rupture restraint work was implemented.

As corrective action Pullman procedure KFPS-7 was issued on December 3, 1973 establishing and implementing a pipe support QA program for process planning and control. In addition, a Pullman Discrepancy Report (Nonconformance Report) was issued on February 11, 1974. This Discrepancy Report recognized that pipe support work was performed prior to establishing process planning and control. As corrective action all Class 1 pipe supports installed without process control were identified, reinspected and inspection findings resolved.

In the inspector's judgement, procedures KFP-8 and KFPS-7 were entirely satisfactory and met NRC requirements. This is documented in NRC Inspection Report 50-275/83-37, paragraph 7 which states, in part, that "The inspector concludes the program elements of KFP-8 and KFPS-7 did establish that documented instructions and procedures were required to be prescribed for control of Pullman's quality related construction activities." The establishment of ESD-264 subsequent to the NSC audit provided a programmatic improvement to an already acceptable system in this area, in that the details of process sheet completion were more precisely defined and prescribed by the ESD-264.

In addition, the NRC has contracted with Lawrence Livermore National Laboratory (LLNL) to provide additional inspection services, in the area of pipe support inspection, to supplement the regional effort. The laboratory inspectors have already examined a sizeable sample of Unit 1 pipe supports and found a very low discrepancy rate on accepted pipe supports. For example, the NRC staff and LLNL inspected about 550 safety related pipe supports, out of a total population of about 4300 modified supports, and identified only 5 items of noncompliance. The results of the laboratory inspections provide additional assurance regarding pipe support acceptability. Therefore, the staff feels that the licensee and Pullman have effected a satisfactory pipe support installation program.

10. Question

"Criterion V, NSC Audit Finding 2. (Final p. 5-6, Draft, p. 40-41):

NSC states that hanger package review was not described in procedures. Region V states that hanger package review was described in KFPS-2 dated December 3, 1973 and that supplementary requirements were incorporated into ESD-254 dated December 30, 1977. What was the basis for reviews conducted prior to December 3, 1973? The draft, but not the final report, states that ESD-253 provided additional detailed information concerning hanger drawing controls. What is the date of ESD-253? Is it NRC's position that hanger package review was described in a manner that

complied with the Appendix B requirements for all periods covered by the NSC audit?

NSC states that other activities not described in procedures included preheating for welding, use of Note-O-Grams, use of Rejection Notices, and maintenance of Field Quality Inspector Daily Logs. Is it the NRC's position that all such activities were described in procedures in a manner that complied with the Appendix E requirements for all periods covered by the NSC audit?"

Answer

Refer to the answer, provided above, to Criterion V, NSC Audit Finding 1 regarding pipe support QA program history. The Pullman Discrepancy Report was resolved, as indicated previously in answer to the question regarding Criterion 5, NSC Audit Finding 1.

It is the NRC staff conclusion that hanger package review was described in a manner that complied with Appendix E requirements during the time periods when hanger package review activities were in progress.

The staff found that preheating was appropriately prescribed on the welding procedure specification (see paragraph 28, page 26, of inspection report 50-275/83-37). It is the NRC staff's conclusion that other activities (such as use of Note-O-Grams, Rejection Notices, and maintenance of Field Quality Inspector Daily Logs) were not required to be prescribed and controlled by written procedures, as indicated on page 6 of inspection report 50-275/83-37.

11. Question

"Criterion V, NSC Audit Finding 3. (Final p. 6-8, Draft, p. 41-42):

NSC found that isometric package review was not sufficiently described. The draft of 83-37 states that "Field procedure ESD-254 (issued 5/6/75) appears to provide an adequate outline guide for review of isometric drawing packages." The final report adds that May 6, 1975 was the earliest date that could be found for ESD-254 and that while most piping installations had been completed prior to May 1975, the inspector found that the final complete document review of isometric drawing packages were performed after ESD-254 was in effect.

Note that draft states that post heat treatment requirements are prescribed in ESD-218. The draft does not indicate that ESD-218 was issued in October 1977. The final report states that post weld heat treatment requirements "were always prescribed by weld procedure specifications." The final report does not refer to specific procedures in effect prior to ESD-218. What is the basis for the conclusion that post weld heat treatment requirements were in compliance with Appendix B prior to issuance of ESD-218 in October 1977?

Is it the NRC staff position that, in the time period encompassed by the NSC audit, non-conformance reporting requirements complied with the requirements of Appendix B?

83-37 states that the "internal audit program, implemented by on-site personnel, (prior to 1978) was determined to be of marginal quality, a redundant program of comprehensive quality was performed concurrently." The redundant program appears to have been one "directed and conducted by corporate management personnel." Did the redundant program find that the internal audit program, implemented by on-site personnel to be of "marginal quality?" Did the corporate audits encompass review of weld and welder quality, and Q.A. programs applied to weld and welder quality? On what dates were the corporate audits conducted and what were their findings?

Region V concluded that, notwithstanding the deficiencies in the internal audit program and the failure of the corporate audit program to discover these deficiencies in a timely manner (e.g. they appear not to have been corrected until 1978), 83-37 concludes that "no major breakdown of the Quality Assurance program had occurred, nor had any significant problems gone undetected, due to deficiencies identified with the internal auditing program." Is it the NRC position that the NSC findings do not indicate that "significant problems (had) gone undetected" until 1974 and, to a lesser extent, between 1974 and 1977?"

Answer

The basis for the NRC staff's conclusion that post weld heat treatment requirements were in compliance with Appendix B prior to issuance of ESD-218 in October 1977 is as stated in the NRC inspection report, "Appropriate post weld heat treatment requirements were always prescribed by welding procedure specifications."

It is the NRC staff's conclusion that nonconformance reporting requirements complied with the requirements of Appendix B. Pullman procedure KFP-10 (issued March 19, 1971) did provide adequate instructions to establish nonconformance reporting requirements in compliance with Appendix B.

The statement that the internal audit program (i.e. those conducted by on site people) was of marginal quality was the opinion of the inspector. His basis was that the breadth and frequency of the internal audits were not entirely consistent with today's guidance. The inspector went on to say that the audits conducted by the corporate people compensated for this and the program as a whole met Appendix B requirements. As far as the inspector can remember the frequency and breadth of the internal audits was not commented upon by the corporate audits. Since the inspector concluded that the Pullman audit program as a whole met all requirements, a detailed catalog of all findings, dates, and resolutions was not made.

As stated in the last paragraph of item 9 in Inspection Report 83-37, it is the staff's position that the Pullman audit program as a whole met the requirements of Appendix B.

12. Question

"Criterion VI, NSC Audit Finding 9a. (Final p. 8-9, Draft, p. 54-55):

NSC stated that a Process Sheet for Isometric 2-14-77 was changed approximately 19 months after the work was done. Region V states that the process sheet (which Region V states should have been in reference to 2-14-47) that "no evidence could be found to indicate that there had been an attempt to alter the dates or signatures on either or both these documents." Does NRC believe the NSC finding to have been in error? How does NSC explain the apparent discrepancy between its findings and those of the NRC? How does Region V know that the sheets it examined were in fact the same sheets examined by NSC?"

Answer

Yes, the NRC staff believes that the NSC finding was in error. In particular, isometric package 2-14-77 did not fit the time frame identified in the NSC finding.

The efforts of the NRC to solicit NSC review and comment on the NRC inspection report have been dealt with in answering question GC-5. These are precisely the types of details that neither the former auditor nor the President of Quadrex could recall.

The NRC staff examined the available records for the referenced isometric packages and found no basis to conclude that the records had been altered since the NSC audit.

13. Question

"Criterion VI, NSC Audit Finding 9b. (Final p. 9-11. Draft, p. 61-64):

NSC concluded that FW-1673 was performed without normal controls. Region V stated in the draft, that "although it was not the usual practice" the weld was carried out in accordance with the then existing design change control system. Is it the NRC position that this departure from the usual practice did not violate the NRC's QA requirements? What is NSC's response to the NRC finding?"

Answer

It is the NRC staff's conclusion that the referenced departure from usual practice was adequately controlled and did not violate the NRC QA requirements.

14. Question

"Criterion VI, NSC Audit Finding 10. (Final p. 13-15. Draft, p. 38-39):

NSC found that no procedure or requirement prohibits changing or alteration of records and documents necessary to track work. Region V stated that prior to 1977, insufficient requirements existed to control the changing or alteration of quality records and documents. Region V also concluded in the final report that neither NSC, nor NRC nor Pullman audits had "identified any unapproved technical changes or other substantive changes which would have adversely affected construction quality." What was done to reach this conclusion? Note that the

conclusion as stated in the draft was less firm; it said: "Pullman's corrective action is complete and appears to be effective. Previous inadequacy of management policy or written instructions in this area is not considered to have resulted in any adverse impact on quality related activities."

Answer

As stated in Inspection Report E3-37, the staff examined the results of Pullman audits, the NSC audit and PG&E audits and related QA records. In addition, the NRC inspection staff was aware of this NSC finding and the documents examined during the inspection were reviewed with particular attention given to unapproved or substantial technical changes.

15. Question

"Criterion VIII, NSC Audit Finding 12. (Final p. 14-15. Draft, p. 59)

NSC stated that ESD-223 did not give adequate instructions for the identification and control of Class I pipe supports. Region V reviewed ESD-223 and stated that specific revisions were dated November 11, 1975 and May 25, 1976. Region V stated that the procedure revisions contained adequate QA/QC instructions for the control and identification of Class I pipe supports. Is it the NRC position that the instructions were adequate prior to the 1975 and 1976 revisions? What is the basis for confidence in the adequacy of instructions prior to the 1975 and 1976 revisions in ESD-223?"

Answer

The Region considers that instructions regarding the control and identification of pipe supports were adequate prior to the referenced revisions of ESD-223. The basis for this conclusion was discussed in the answer to the question regarding Criterion V, NSC Audit Finding 1.

16. Question

"Criterion IX, NSC Audit Finding 10b. (Final p. 17-18, Draft p. 6-7.):

NSC found that from August 1972 through December 1972 a ninety day Welders' Log was not maintained nor did a Weekly Qualified Welders' List exist for that time. Region V agreed there was no weekly log but that a 90 day log did exist. Did Region V seek to determine the reason for the discrepant findings?"

Answer

Yes, the NRC did determine the source of the discrepancy. The void in the 90 day log had been reconstructed by Pullman subsequent to the NSC audit by using the weld rod withdrawal slips for the period in question. It should be noted that the 90 day log is normally made up using these weld rod withdrawal slips. This seeming discrepancy was dealt with in SSER-22 and was discussed in the March 26, 1984 Commission meeting.

17. Question

"Criterion IX, NSC Audit Finding 10c. (Final p. 18-19, Draft p. 7-8):

NSC found that the Ninety Day Welders' Log was not sufficiently detailed to determine if the welder was qualified to perform certain procedures. The draft stated that the "90 day qualified welders' log was sufficiently detailed to determine whether a welder was qualified to perform certain procedures." The draft did not state that the 90 day welders' log complied with applicable code requirements. The final report, states, depending upon the manner in which a sentence is interpreted, either that the log complied with the code or, alternatively, that the welder complied with the code requirements. Is it the NRC position that for the period covered by the NSC audit that the 90 day welders' log was in compliance with code requirements?

Note also that Region V based its conclusion in part upon discussions with the former Authorized Inspector. Does a record of these discussions exist? What was the substance of such discussions?"

Answer

The ASME Code does not require a 90 day log - only that some reliable method of determining welder activity be maintained. It is the staff's position that the 90 day log based on the weld rod withdrawal slips constitutes a reasonable method of complying with this requirement.

The discussion with the former Authorized Inspector was not relied upon in reaching the conclusions presented in the NRC inspection report because the former Authorized Inspector was, at the time of interview, an employee of Pullman. The discussion results were merely considered another data point recognizing that, while the information was given by an industry professional, the information may be of dubious value. The inspector relied instead on the results of his examination of the 90 day welders' logs. A record of that discussion exists in the Region V files as discussed in answer to GC-1.

The substance of the former Authorized Inspector's information was that, in his opinion, Pullman had adequately tracked and documented welder qualifications and had used weld rod withdrawal sheets to verify whether a welder had used a particular process as a supplement to the original welder qualification record. This is stated in report 83-37.

18. Question

"Criterion IX, NSC Audit Finding 10d. (Final p. 19-20, Draft p. 9-10):

NSC states that no procedure stated what the Field Quality Assurance Inspector was to use as the primary means to determine welder qualification. Region V appears to agree that a procedure did not exist but that weld filler metal withdrawal sheets and welder qualification records were used to determine welder qualification and that this method satisfied code requirements? Is it the NRC staff position that, the absence of a specific procedure notwithstanding, the method used by

inspectors to ascertain welder qualifications complied with code requirements?"

Answer

Yes, the staff considers that the method historically used by Pullman (i.e., weld filler metal withdrawal sheets and welder qualification records) was sufficient and adequate to document and verify welder qualification, as required by the ASME B&PV Code, Section IX (refer to paragraphs 9 and 21 of inspection report 50-275/83-37).

19. Question

"Criterion IX, NSC Audit Finding 10h, 10i. (Final p. 22-23, Draft p. 13-16):

The draft focuses on question as to whether auditors' observations need be recorded on the "process sheet or the inspectors' daily work sheet." The draft does not indicate that the inspector examined the welder audit sheets. The final does state that the inspector examined welder audit sheets but does not indicate the period covered by the examination. The final version of 83-37 states in 10h that the welder audits were "a Pullman program requirement in excess of the ASME code requirements" and twice in 10i that the program requirements "appeared" in excess of code requirements. The DRAFT did not mention that the code did not require a welder audit.

Draft 10i (p. 15) says "...records of the 9/73 revision and 11/73 implemented procedure are not available." Final drops this part stating (p. 23) "The November 1973 revision apparently was issued and implemented beginning in November 1973. ...welder audit sheets indicate that the required welder audits were performed beginning November 1, 1973." The following statement appears in the draft but not the final: "The welder audit sheets examined indicate the ferrite control measurements were performed on welds by the auditors." Why was this statement dropped? Is the statement accurate? Was there a requirement to make ferrite control measurements?

What is the significance of failing to adhere to ESD-219 if the ASME code does not require welder audits?

Note following statement in draft does not appear in final: "Since the record of the 9/73 revision is not available, the inspector could not determine when the procedure was approved for implementation and, thus, was not able to corroborate the Pullman statement that the September 1973 revision was made to initiate the auditing of welders." The draft and final state that "the inspector was not able to corroborate the NSC statement that Pullman was in noncompliance with the procedure for about 23 months."

Is the staff's conclusion that neither Item 10h nor Item 10i were identifiable items of noncompliance or deviation rest on the assumption that welders' audits were not required by the ASME code?"

Answer

The statement regarding ferrite control measurements was dropped from the final because it did not contribute in any meaningful way to addressing the finding identified by NSC. The draft version did not maintain a focus on the issue addressed by the NSC finding addressed in paragraph 24 of NRC Inspection Report 50-275/83-37. The statement is, however, accurate.

Ferrite control measurements were included as one of several suggested inspections on the welder audit sheet. The welder audit program was structured around a sampling approach and applied to in process welding activities. There was no requirement that each welder audit performed should address each and every suggested inspection attribute identified on the welder audit sheet. For example, even though the same welder audit sheet format would have been used for both carbon steel and stainless steel welding activities, a measurement of ferrite level on a carbon steel weldment would be quite meaningless. The intent was that a welder audit should sample the suggested attributes with emphasis on those suggested attributes which could be meaningfully examined at the time of the welder audit performance.

The NRC staff did not assess the significance of failing to adhere to the welder audit program of ESD-219 because the NRC found that Pullman did acceptably implement the ESD-219 specified welder audit program.

The staff's conclusion that Pullman had acceptably implemented the welder audit program was the basis for the determination, in items 10h and 10i, that no items of noncompliance or deviations were identified. The fact that the Code does not require such a welder audit program has no bearing on the finding of acceptable implementation, but the Code was mentioned merely to provide additional perspective.

20. Question

"Criterion IX, NSC Audit Finding 10j. (Final p. 23-24, Draft p. 16-18):

Note change from draft which relied on the examination of 25 welds to find that "...there is a high probability that other stainless steel welds installed in the plant comply with delta-ferrite acceptance criteria." The final report cites a "random sample of 25 stainless steel welds" as "an additional check". Primary reliance for the final report's conclusion that "the inspector was not able to corroborate that Pullman was in noncompliance with this procedure requirement for 12 months" was based on the assumption that stainless steel welding did not begin until early 1973. If it is true that on-site stainless steel welding did not begin until 1973, what is the relevance of the examination of the 25 welds since the NSC finding applied to the pre 1973 period?

Is there a documented basis for the statement "Based on discussions with PG&E personnel it appears that stainless steel welding on site began in early 1973?"

Answer

Contrary to the characterization above, the staff's conclusion was not based on the assumption that stainless steel welding did not begin until 1973. The staff's conclusion was based on the fact that ESD-219 became effective in November 1973 yet the severin gauges were on site as early as December 1972.

21. Question

"Criterion IX, NSC Audit Finding 10k. (Final p. 24-25, Draft p. 120-121.):

The NSC finding that "Hangers are not welded in accordance with Pacific Gas & Electric Company requirements" was not confirmed. Did NSC err in observing that hangers were welded to structural steel on the wrong side of the bracket? What was Pullman's response to the NSC finding? Would NSC agree that an error of this kind would be made in the audit? Was an effort made to determine whether the hangers might have been modified following the audit?"

Answer

Yes, the staff believes that the NSC finding was in error. This conclusion is also stated in the staff response to this NSC finding-- (Reference: NRC Inspection Report No. 50-275/83-37, page 24).

The Pullman response states, in part, that, "Pullman inspection personnel have reviewed Hangers No. 2023-IV and 2039-2V and found that they were welded in accordance with customer drawings."

The efforts of the staff to solicit NSC review and comment on the NRC inspection report have been dealt with in answering a previous question (GC-5).

Yes, the staff examined the available records for the referenced hangers and found no evidence to conclude that the hangers had been modified or reworked after the NSC audit.

22. Question

"Criterion IX, NSC Audit Finding 10n. (Final p. 26-27, Draft p. 20-21.)

NSC found that there was no procedure for preheating weld joints. The draft report (p. 21) states that a series of weld procedure specifications was examined and that each contained "an adequate definition of preheat, postweld heat treatment and interpass temperatures." The draft also states that "ESD-218 (Postweld Heat and Preheat Treatment Procedure) was revised 12/30/77 to prescribe preheat requirements and indicate preheat applicability." An adjacent handwritten comment (p. 21) asks "How about b/f 12/30/77?" Does this mean that the procedures were or were not adequate prior to 12/30/77?

The final report (p. 27) contains an additional statement to the effect that prior to early 1978, compliance with the preheat requirement was dependent upon the welder's knowledge etc. Did the procedure described

in the second paragraph on p. 27 comply with Appendix B? What was the basis for the added language? Was there discussion with Pullman or PG&E on this point beyond that which occurred during the inspection that ended on December 9, 1983?

The penultimate paragraph on this item states "while no separate and specific procedure for preheating of weld joints existed prior to December 30, 1977, preheating requirements were adequately prescribed by the welding procedure specifications and documented by signature on the welding block of the process sheet, which specified the applicable welding procedure." Was this in compliance with Appendix B?"

Answer

The handwritten comment does not mean that preheat procedures were inadequate prior to December 30, 1977. The handwritten comment was made by the Region V Administrator to instruct the inspector to make clear the situation that existed prior to December 30, 1977.

The finding that preheating was adequately prescribed is documented in paragraph 29 of the NRC inspection report which states "The inspector concludes that, while no separate and specific procedure for preheating of weld joints existed prior to December 30, 1977, preheating requirements were adequately prescribed by the welding procedure specifications and documented by signature on the welding block of the process sheet, which specified the applicable welding procedure."

This was in compliance with Appendix B, hence the finding in paragraph 29 of the NRC inspection report that "No items of noncompliance or deviations were identified."

The added language of the second paragraph on page 27 was to clarify the preheat prescription, implementation and documentation process. To the best of the inspector's recollection, there was no further discussion with Pullman or PG&E on this point beyond that which occurred during the inspection, which ended on December 9, 1983.

23. Question

"Criterion IX, NSC Audit Finding 10o. (Final p. 27-30. Draft p. 21-26.):

NSC stated that the initial results of welding auditing (from November 5, 1973 to February 1974) indicated the existence of 7 problems which, if they did exist, raised question about weld quality. NSC concluded on the basis of a review of these audits that "...there is no confidence that welding done prior to 1974 was performed in accordance with welding specification requirements."

The NRC inspector said he had "critically examined the records of welder audits performed between November 1, 1973 and April 1, 1974." On the basis of an examination of 183 audit records from this period the NRC inspector concluded that the "aggregate of problem areas is not so pervasive such that support can be given to the NSC conclusion" that

there is no confidence that pre-1974 welding had been performed in accord with requirements.

83-37 states that "It is important to recognize that none of these were NSC findings, but were instead findings of the Pullman welder audit program, which was designed to detect program weaknesses and provide prompt corrective action during the early phases of site welding activity." The problem is that the welder audits referred to by the Region V inspector (which were found by Region V under 10h and 10i above to be beyond what was required by the code) were not initiated until November 1973. In addition, the NSC audit states that its findings were based on a review of Pullman's audits conducted in the period "from November 5, 1973 to February, 1974). Therefore, how could the audit program, upon which Region V relies "detect welding program weaknesses and provide prompt corrective action during early phases of site welding" if the audit program was not initiated until November 1974?

In sum, the NSC finding, based on findings obtained from a review of audits conducted after November 1, 1973, was that "...there is no confidence that welding done prior to early 1974 was done in accordance with welding specifications." Region V, on the other hand, based on a review of audit reports prepared during essentially the same period as the reports reviewed by NSC [and ignoring the above noted finding (Final, p. 23) that "the required welder audits were performed beginning November 1, 1973"] concludes "no support can be given the [above quoted] NSC conclusion." Region V does not deal with neither (A) the fact of there having been no welder audits prior to November 1973 nor (B) the question of whether the types of deficiency discovered in the initial audits existed in prior years.

[At the March 19 Commission meeting, statements were apparently made to the effect that audits other than those that pursuant to the ESD-219 program were conducted prior to November 1973. If so, were the findings of such audits discussed in 83-37? Where? Why were these findings, rather than those in the post November 1973 period, used to refute the NSC findings?]"

Answer

Again, as discussed in our response to GC-1, the purpose of the inspection was to determine if the NSC conclusions could reasonably be drawn from the QA record they reviewed. We did not undertake to reconstruct the entire quality history of the Pullman activity.

Dr. Myers correctly points out that both NSC and the staff looked at the record of welder audits from November 1973 through Spring of 1974. However, as stated in paragraph 30 of report 83-37, the NRC staff did not feel that many of the NSC conclusions could reasonably be drawn from the QA records they reviewed. Even though the welder audits did not start until November 1973, the Pullman internal audits and corporate audits (previously discussed) routinely examined in-process welding and were implemented from the beginning of work. As stated previously we found the basic audit program to be satisfactory and in compliance with Appendix B.

As a result of discussion at the March 26 Commission meeting the staff reviewed the Pullman audits and the PG&E audits done in the pre 1974 time period in more detail. The results are reported in Inspection Report 84-16 and confirm that the audit program met the requirements of Appendix B.

Many of the following questions deal with very specific hardware items during the pre November 1973 period. It is important to keep the inspection purpose in perspective. It was not the NRC staff's purpose to perform a detailed evaluation of hardware in the plant. Rather, the purpose was to assess whether the licensee and his contractors were doing a responsible job of controlling construction and assuring the adequacy of hardware evaluation. As stated previously, the basic system of audits applied to Pullman welding from the start of work was satisfactory and met Appendix B. The addition of the Pullman welder audit program in November 1973 was beneficial and improved the Pullman system of audits.

24. Question

"Criterion IX, NSC Audit Finding 10o, Item 1. (Final p. 28. Draft p. 23.):

The draft, without citing documents, appears to rely on the gas flow - being "near the 20 cfm requirement" for its conclusion that defective welds might have resulted from inadequate shielding and purging. The draft states that excessively low flow rates would have been manifest in unacceptable porosity which would have been detected by NDE; the draft does not indicate the extent to which unacceptable porosity was found. The final does not state that the flow was near the 20 cfm requirement; it does state that "The vast majority of safety related stainless steel welds were radiographically examined and the film was reviewed and accepted by a qualified interpreter for code compliance." How many welds were not radiographically examined? How many were examined? Of those that were examined, what percentage exhibited excessive porosity? What was done to determine whether shielding and purging deficiencies that might have existed prior to the first welder audit? What was done to correct for such deficiencies?"

Answer

The NRC staff did not consider the specific deficiencies found in the purging and shielding area by the welder audits to be of much technical significance. Consequently, no effort was made to reconstruct the nondestructive examination history of the welds in question nor was it considered worthwhile to do so. The problem here was one normally encountered in a purge gas distribution system when welders hook into or drop off of it during the course of the work day. Pressure and flow variations are introduced in the various distribution outlets. Weld quality is not very sensitive to purge gas flow. As long as the purge gas flows are maintained at all, no ASME code violations are involved. The inspector found in his analysis of the situation that flows were maintained and in most all cases were reasonably near 20 cfm. As noted in our report, the critical welds in question would have been given

radiography and all pressure boundary welds are given a hydrostatic test which provides additional assurance of weld quality.

Prior to the initiation of welder audits in November 1973, in process welding was audited by the site and corporate audits as discussed in paragraph 23.

25. Question

"Criterion IX, NSC Audit Finding 10c, Item 2. (Final p. 28. Draft p. 23-24.)

What is the significance of 14 out of 183 audits identifying that welders did not have tempil sticks? Region V states that in each case that a welder was found not to have a tempil stick, one was provided. What was done to determine the extent to which welders did not have tempil sticks prior to November 1973? Does the code allow interpass temperature requirements to be met by the resumption of welding delayed until the welder "can touch the weld?" The draft, but not the final, states that "Tempil sticks were used by welders in the vast majority of cases." What constitutes a "vast majority?" What was done to determine whether there was a tempil stick problem prior to November 1973?"

Answer

The significance is that some fraction of the welders were not complying with their own internal procedures (i.e. having a Tempil stick in their possession). The Pullman audits were effective in identifying this. This had no real technical significance since no preheat or interpass temperature violations of the ASME Code were identified. The ASME code does not mandate the use of tempil sticks. Use of touch to ensure interpass limits were not exceeded would be allowed by Code. The inspector saw no reason to pursue the tempil stick issue back prior to November 1973.

26. Question

"Criterion IX, NSC Audit Finding 10c, Item 3. (Final p. 28. Draft p. 24.)

The draft states that in 4 out of 183 instances where amperages were not within the welding procedure specification limit, the welder corrected his amperage setting. The draft stopped there. The final adds statements to the effect that defects resulting from improper amperages would be found during inspections. The final also adds a statement that "...amperage is not an essential variable specified by the ASME code...." Does this mean that a welds produced with improper amperages could still be in compliance with the code? What about improper amperages that might have been used prior to November 1973?"

Answer

Yes, welds produced with improper amperages could still be in compliance with the code. Amperage is but one variable used by the welding engineers to obtain the proper welding heat input. Other variables are

voltage and travel speed. Each of these variables are normally specified in a welding procedure specification using fairly wide limits and a change in one variable is usually compensated for, by a journeyman welder, by a slight change in another.

In the judgement of the inspector, it did not appear to be a necessary or particularly fruitful exercise to attempt to assemble amperage data for the period prior to November, 1973.

27. Question

"Criterion IX, NSC Audit Finding 10o. Item 4. (Final p. 28-29. Draft p. 24.)

83-37 states concludes the "vast majority" of welders used welding procedures and knew where to obtain them. Those that did not have them were told to get them. Those that did not know where they could be found were given "an explanation of the location from where they could be obtained." This finding was based on welder audits conducted after November 1973. What is Region V's position with regard to those not members of the "great majority?" What is Region V's position with regard to the availability of procedures and welders' knowledge of where procedures could be obtained in the period prior to November 1973?"

Answer

The NRC staff position is that all welders should know where the procedures are and the Pullman audits properly identified and corrected the situation. The inspector noted that the welding auditors did not identify defective welding as a result of their original findings in this area.

Region V had no reason to believe that the situation was any worse prior to November 1973 and, thus, saw no reason to pursue this issue any further.

28. Question

"Criterion IX, NSC Audit Finding 10o, Item 5. (Final p. 29. Draft p. 24.)

NSC found that the oxygen analyzer was not available or not operative. Region V concludes that only one of the 183 audits reviewed "indicated a problem with the oxygen analyzer." What was done by Region V to determine the basis for the significant discrepancy between its finding and those of NSC? What documentation was examined?"

Answer

The staff's rationale for its conclusion is stated in NRC Inspection Report No. 83-37, paragraph 30, page 29. As stated previously in the answer to question GC-5 the staff has attempted to solicit review and comment from NSC on NRC Inspection Report No. 83-37.

29. Question

"Criterion IX, NSC Audit Finding 10o, Item 6. (Final p. 29. Draft p. 25.)

NSC concluded that "Oven rod temperature was not monitored by the welders." 83-37 states that 14 of 183 audits identified instances where rod oven temperatures were lower than those which were required. A note on the draft states: "With this many audit findings the rod oven temperature must have been too low much of the time." The NRC concludes that "The NSC finding that rod oven temperature was not monitored by the welders is not supported by the audits, although isolated instances of ovens being below temperature were identified by the audits." Is it correct that 14 out of 183 constitutes "isolated instances?" What is the NRC position with regard to temperature control during the period prior to the initial welders' audit?"

Answer

As stated in the report (page 29), the technical significance of this finding is minimal. Further, there was no code violation associated with the finding. The audit finding did point out that welders should have been more alert in monitoring their rod ovens. Pullman's audits recognized this condition and took corrective action.

Region V found no reason to believe the situation was any different prior to November 1973 and saw no reason to pursue this issue further.

30. Question

"Criterion IX, NSC Audit Finding 10o, Item 7. (Final p. 29. Draft p. 25.)

The NSC stated that "Many welders did not understand their duties and responsibilities." Region V states that "Of the 183 audits received, five welder audits indicated that the welder in question did not understand their (sic) duties and responsibilities." The final, but not the draft, contains a sentence: "The NRC considers that the reason these welder audits were done was to identify such instances and provide corrective action." The draft and final report state that "In each case the welder was reinstructed by the QA inspector auditing the welding...." 83-37 does not address the pre-November 1973 period during which audits were not conducted. What mechanism existed prior to November 1973 to identify situations where welders did not understand their duties and responsibilities? What is the basis for assurance that, prior to November 1973, welders understood their duties and responsibilities?"

Answer

As discussed in paragraph 23, there was an active audit program in existence prior to November 1973 which routinely examined in process welding.

31. Question

"Criterion X, NSC Audit Finding 5,6. (Final p. 30-31. Draft p. 26-28.)

NSC found that the inspection process is generally inauditable on the ground that there were acceptance signatures that did not permit a determination of whether the individual inspection requirements were fulfilled. Region V states that acceptance process sheets identified the procedures necessary to perform a particular inspection and the acceptance signatures were sufficient documentation of these procedures having been followed. The final report, but not the draft, states that this practice was "in accordance with standard industry practice, and in compliance with ASME code requirements...." Was this practice employed at other plants under construction during this period? Did NSC consider this practice in compliance with the ASME code? What was Pullman's response?"

Answer

The staff has observed similar documentation practice at other nuclear plants under construction in that each inspection attribute is not contained as a separate line item on the work process traveler. The staff feels that to list each attribute in detail would unnecessarily complicate the process traveler system. The staff's conclusion that the Pullman practice was in compliance with ASME Code requirements is still valid.

The NSC audit did not address the issue of ASME Code compliance here.

Pullman stated that their program complied with the ASME Code and regulatory requirements and that their program was acceptable and auditable.

32. Question

"Criterion X, NSC Audit Finding 7. (Final p. 31. Draft p. 28-29.)

NSC found that a "large number of welds...were accepted for visual examination and thereafter accepted on surface NDE inspection.... Visual examination of those welds indicates that the surface is not acceptable for performance of surface NDE inspection." The final report, but not the draft, states "The inspector concludes that the NSC finding (that the surface of the welds was not acceptable for surface NDE inspection) was in error." What is the basis for these contradictory conclusions? Did NSC and NRC inspect the same surfaces? What evidence exists to demonstrate that remedial work was not carried out in the time between the NSC and NRC inspections?"

Answer

The staff's basis and rationale for its conclusion is stated in NRC Inspection Report No. 83-37, paragraph 32 - page 31. The staff cannot state what NSC's response to the NRC finding would be, though as stated previously the NRC has offered NSC the opportunity to review and comment on NRC Inspection Report No. 83-37.

The staff examined the weld surface of the welds contained in the referenced isometric package as indicated in the NSC Audit Report.

The staff examined the available records for the reference welds and found no document referencing rework or repair after or since the NSC audit.

33. Question

"Criterion X, NSC Audit Finding 9. (Final p. 31-32. Draft p. 28-29.)

The NRC disagreed with the NSC implied finding that inking "R1" onto a radiograph was not permitted by the code. NRC also disagreed with NSC that FW-83 contained a surface defect "that is questionable for acceptance under visual standards." Does NSC agree with NRC's findings?"

Answer

Refer to the answer to question GC-5 regarding NSCs views.

34. Question

"Criterion X, NSC Audit Finding 10a. (Final p. 32-33. Draft p. 28-29.)

NSC found that "Records of welder qualification prior to 1972 are not available." Thus, the inspector was not able to verify the validity of the Pullman response to the NSC audit finding." Region V found that 20 welders were qualified prior to 1972. Region V also found that the 90 day qualified welders log was started "at the beginning of 1972." The draft report, but not the final, states: "The inspector was not able to determine when the first production welding was performed or on what system the first weld was accomplished." The final report, but not the draft states: "The inspector concludes that records of welder qualification prior to 1972 were available and, in acceptable order."

Does Region V now know when the first production welding was performed and on what system? In light of NRC having found records for 20 welders, has NSC been asked why they found that records were not available? Does Region V believe that the welder qualification records for this period are complete? How many active welders are shown on the initial 90 day qualified welders log? Is this log consistent with Region V's findings regarding the 20 welders?"

Answer

Note: This should have been titled Criterion IX, NSC Finding 10a, in the final report.

Yes, the first class 1 production pipe weld was performed on December 28, 1971, on the Component Cooling Water System.

The issue of NSCs views was addressed in the answer to question GC-5.

Yes, the staff believes that the records for the referenced period are complete. As stated in NRC Inspection Report No. 83-37, paragraph 34, page 33, "The inspector concludes that records of welder qualification prior to 1972 were available and were in acceptable order."

The NRC did not catalog and itemize the welders shown on the first 90 day log and saw no particular reason why this would have been necessary or desirable.

35. Question

"Criterion XIII, NSC Audit Finding 5. (Final p. 35-38. Draft p. 31-37.)

Note that last paragraph on Draft, p. 37 was dropped. The dropped paragraph mentions a PG&E audit of Pullman which identified programmatic and hardware discrepancies? What is the nature of these discrepancies? Was there a requirement that they be reported to the NRC? Were they reported to the NRC? Does Region V have a basis for concluding that appropriate corrective actions were taken. Note the reference to the inspector having discussed this matter with Pullman and PG&E personnel. What was the nature of these discussions? Do written summaries of these discussions exist? Is it Region V's position that for the entire period covered by the NSC audit, Pullman was in compliance with applicable NRC requirements pertaining to handling procedures?"

Answer

The nature of the discrepancies identified in the PG&E audit of Pullman are described in attachment 5 to the Affidavit of Russell P. Wischow, dated September 21, 1983, to the ASLAB.

These discrepancies were not reported to the NRC. The reporting requirements are described in 10 CFR 50.55(e). It is the NRC staff's conclusion that none of the identified discrepancies met the threshold defined in the regulation; thus, reporting these discrepancies to the NRC was not considered necessary.

As indicated on page 37 of the draft inspection report referenced by Dr. Myers, the inspector selectively examined the discrepancy resolutions and based upon those examinations obtained assurance that appropriate corrective actions were taken. This is documented on page 3 of the draft inspection report. The whole subject was dropped from the final report because it was irrelevant to the stated purpose of the inspection. During the course of this selective examination discussions were held with PG&E personnel regarding the location of the discrepancy reports and the corrective actions. These discussions were essentially an attempt to obtain the necessary documents for review. These discussions were not documented on written summaries because they contributed little to the overall NRC conclusion.

The NRC inspector did not attempt to reconstruct a history regarding compliance with handling procedures, nor apparently did NSC. The NSC statement was that "handling procedures do not exist" and the NRC's examination addressed whether or not such procedures did exist. The

inspector found that "appropriate and adequate handling requirements were in place."

36. Question

"Criterion XIV, NSC Audit Finding 1. (Final p. 38-39. Draft p. 59-60.):

NSC stated that the Field Process Sheet was inadequate. Region V reached a contrary conclusion. What is the basis for the discrepant findings? Is it the NRC staff position that the Field Process Sheet adequately controlled and specified required work activities?"

Answer

The staff's rationale for reaching the conclusion that the Field Process Sheet was adequate is contained in NRC Inspection Report No. 83-37, paragraph 40, pages 38-39.

Yes, the staff states in NRC Inspection Report No. 83-37 that, "...The inspector concludes that the use of the field process sheet adequately controlled and specified required work activities."

37. Question

"Criterion XV. NSC Audit Report, p. 36:

NSC found, among other things, that "Systems that circumvent the nonconformance system have been established." This finding was not addressed in 83-37. What is the NRC's response to this finding?"

Answer

During the inspection planning process the staff read the NSC finding, the Pullman response and the PG&E response. The staff determined that this item did not meet the selection criteria of paragraph 4 of report 83-37.

38. Question

"Criterion XVI, NSC Audit Finding 2. (Final p. 39. Draft 60-61.):

NSC stated that it appeared that a corrective action system had not been operative. Region V cited examples where corrective actions had been taken in response to audits. Was NSC's reference to a corrective actions system intended to encompass corrective actions in response to nonconformance reports? Are the samples cited by Region V sufficient to demonstrate that the Pullman did have an operative corrective action system?"

Answer

Refer to the answer to question GC-5.

Yes, the staff feels that the examples cited in the NRC inspection report were sufficient to show the breadth of the contractor's and licensee's corrective action system.

39. Question

"Criterion XVIII, NSC Audit Finding 3. (Final p. 39-40, Draft p. 45-46.):

NSC states that management audits were ineffectual. Region V stated that "there is no basis to suggest these audits were ineffectual." Why did NSC and Region V reach such disparate conclusions?"

Answer

The staff's rationale for reaching the conclusion that "There is no evidence to suggest these audits were ineffectual," is stated in NRC Inspection Report No. 83-37, paragraph 42, page 40. Refer to the answer to question GC-5 regarding NSC.