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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before The Atomic Safety And Licensing Appeal Board

OFFICE OF SECRETARY
OF ENERGY
WASHINGTON, D.C.
BRANCH

In the Matter of Pacific Gas)	Docket Nos. 50-275 O.L.
and Electric Company (Diablo)	50-323 O.L.
Canyon Nuclear Power Plant,)	(Construction Quality
Units No. 1 and 2))	Assurance)

AFFIDAVIT OF
RUSSELL P. WISCHOW

I, Russell P. Wischow, being duly sworn depose and state as follows:

1. I am currently employed by Pacific Gas and Electric Company, 77 Beale Street, San Francisco, California; my title is Manager, Geysers Project. During the period from September 1, 1976 through January 31, 1978, I was Director, Quality Assurance Department. A copy of my professional qualifications is attached (Attachment 1). I have read the Joint Intervenors' Supplement dated September 9, 1983, and have the following comments.

2. In July 1977 PGandE requested Pullman Power Products Corporation (Pullman) to have an independent audit performed of the work Pullman had done at Diablo Canyon with

1 particular attention to the adequacy of installed hardware.
2 Pullman is the principal piping contractor for Diablo Canyon
3 Units 1 and 2. Pullman was issued American Society of
4 Mechanical Engineers (ASME) Certificates of Authorization
5 (NPT and NA) in December 1972 which were renewed on
6 October 14, 1977 (Attachment 2). Pullman contracted with
7 NSC to have the audit done and PGandE concurred in that
8 selection. The audit was performed by NSC from August 22
9 through September 20, 1977 and the Report submitted to
10 Pullman by letter dated October 24, 1977. (Attachment 3.)

11 3. I testified at the October 1977 hearings in
12 San Luis Obispo as to the adequacy and content of the PGandE
13 QA program, procedures, policies, audits, and implementation
14 thereof. The NSC audit was not complete at that time and no
15 definitive results were provided for us to review and
16 evaluate prior to early 1978.

17 4. After receipt of the NSC audit report Pullman
18 conducted an internal review of the Report during the period
19 October 1977 through January 1978. Pullman determined that
20 the NSC had directed the audit primarily toward a review of
21 program, procedures and policies rather than to concentrate
22 on the adequacy of the installed hardware as was intended by
23 PGandE. Pullman also concluded that NSC performed the audit
24 of the 1971-77 Pullman QA program against the 1977 NRC
25 regulations and interpretive guidelines rather than against
26 the regulations and interpretive guidelines that were

1 applicable at the time that the work was done. Furthermore,
2 to some extent, the audit was also performed and evaluated
3 against NSC internal guidelines and opinions rather than
4 what was actually required by the regulations, guidelines,
5 and applicable codes.

6 5. In mid-February 1978, Pullman provided PGandE
7 with a draft of its review together with a copy of the NSC
8 report. Pullman formally forwarded its response and the NSC
9 Audit Report to PGandE on April 11, 1978. (Attachment 4.)
10 PGandE reviewed these documents in February-March 1978 and
11 held discussions with Pullman concerning the findings.
12 PGandE agreed that the NSC audit was misdirected in that the
13 hardware installed by Pullman had not been audited by NSC as
14 was intended. We concurred with Pullman that many of the
15 NSC opinions were not consistent with the QA requirements at
16 the time that the work was done and, in some instances, the
17 opinions were inconsistent with the then-current 1977
18 regulations and requirements. Regardless of this
19 misunderstanding, we required appropriate corrective actions
20 to be taken on the results of this audit in accordance with
21 the then current PGandE Corporate QA Program.

22 6. Furthermore, I established a special review
23 team, reporting directly to me, to review and evaluate the
24 NSC audit report and to perform an audit of what NSC was
25 supposed to have done; i.e., audit the Pullman physical work
26 at Diablo Canyon. This audit was specifically designed to:

- 1 ° Determine if the Pullman QA program met the
- 2 requirements of the applicable regulations, codes and
- 3 standards at the time that the work was done;
- 4 ° Determine if the NSC findings were valid; and
- 5 ° Verify if the components and supports installed by
- 6 Pullman conformed to applicable specifications,
- 7 drawings, and quality standards.

8 7. The PGandE audit was conducted from April 2
9 through June 1, 1978 and a summary report submitted to Mr.
10 J. D. Worthington, Executive Vice President and the
11 applicable departments on June 13, 1978. In the cover
12 letter of this audit report, I concluded that the Pullman
13 Program met applicable requirements. (Attachment 5.) A
14 separate report which reviewed the NSC audit findings in
15 detail was submitted to Mr. R. S. Bain, Manager, Station
16 Construction, on June 16, 1978. (Attachment 6.)

17 8. Corrective actions as a result of the PGandE
18 audit and review were identified as either Non-Conformance
19 Reports (NCR) or as Minor Variation Reports (MVR). The
20 PGandE QA department, through continuing on-site
21 surveillance efforts, assured that identified corrective
22 actions were taken, results were evaluated and the
23 deficiencies or non-conformances were closed out in
24 accordance with the PGandE QA Program. (Attachment 7.)

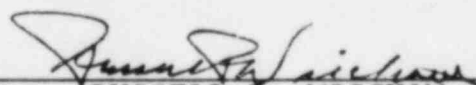
25 9. This documentation was available both on site
26 and in the General Office for NRC inspection. An NRC

1 inspection was made during the time period after the audit
2 results were reported and while corrective actions were
3 being taken by PGandE and Pullman. (Attachment 8.)

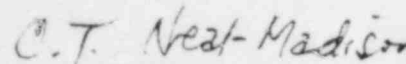
4 10. The foregoing actions taken by both Pullman
5 and PGandE forcefully demonstrate that the PGandE QA program
6 was responsive to the applicable NRC quality requirements
7 and that Pullman had an effective quality program.
8 Deficiencies were identified and corrective actions were
9 taken in a prudent, prompt manner consistent with good
10 quality practices.

11 11. Attachments 2 through 8 to this affidavit are
12 true and correct copies of documents in official PGandE
13 files.

14
15 Dated: September 21, 1983
16

17
18 
19 RUSSELL P. WISCHOW

20 Subscribed and sworn to before me
21 this 21st day of September, 1983

22 
23 C. T. NEAL-MADISON

24 Notary Public in and for the
25 City and County of San Francisco,
26 State of California.

My commission expires
December 27, 1985



• ATTACHMENTS TO
AFFIDAVIT OF
RUSSELL P. WISCHOW

Professional Qualifications
of
Russell P. Wischow

Education

Ph.D Chemistry, Vanderbilt University 1958
M.S. Chemistry, North Dakota State University 1952
B.S. Chemistry, North Dakota State University 1951

Registration

Professional Engineer, Quality Engineering, State of California

Professional Societies

American Chemical Society
Fellow, American Institute of Chemists
Sigma Xi
Project Management Institute

Professional Experience

September 1976 - Present

Pacific Gas and Electric Company
• Director, Quality Assurance 9/76 - 11/78
• Geysers Project Manager 12/78 - present

April 1970 - September 1976:

President, Nuclear Audit and Testing Company and
Vice President, E. R. Johnson Associates, Inc., Washington, D.C.

September 1967 - April 1970:

Director, Division of Nuclear Materials Safeguards, U. S. Atomic Energy
Commission, Washington, D.C.

October 1965 - September 1967:

Assistant General Manager, Nuclear Fuel Services, Inc., Washington, D.C.

April 1963 - October 1965:

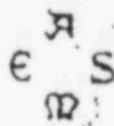
Supervisor, Chemistry Department, Martin Company, Baltimore, Maryland

June 1952 - April 1963:

Senior Research Chemist, Callery Chemical Company Company
Group Leader, Union Carbide Nuclear Company

Summary

Over thirty years experience. Management positions were in regulatory, government, research and development, chemical process, design, construction, plant operations, and project management activities.



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Certificate of Authorization

Number N - 392-2

THIS IS TO CERTIFY that M.W. KELLOGG CO. DIV. OF PULLMAN, INC.
Pacific Gas and Electric Co. Nuclear Station, Diablo Canyon, Cal.

is hereby authorized to use the "NPT"
symbol of The American Society of Mechanical Engineers for

Classes 1, 2, 3 & MC Field Fabrication of
Nuclear Parts, Appurtenances, and Piping
Subassemblies, 72 inches, maximum diameter,
at Diablo Canyon site, Units 1 & 2 only.

in accordance with the applicable rules of the Boiler and Pressure
Vessel Code of The American Society of Mechanical Engineers.
The use of the Code symbol and the authority granted by this
certificate of authorization are subject to the provisions of the
agreement set forth in the application. Any construction stamped
with this symbol shall have been built strictly in accordance with
the provisions of the Boiler and Pressure Vessel Code of The
American Society of Mechanical Engineers.

THIS AUTHORIZATION expires on Completion of Contract

Authorized on December 18, 1972 for

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
by the BOILER AND PRESSURE VESSEL COMMITTEE

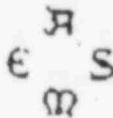


Chairman

L. P. Zick, Jr.

Secretary

W. B. Hoyt



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Certificate of Authorization

Number N - 393-2

THIS IS TO CERTIFY that M.W. KELLOGG CO. DIV. OF PULLMAN, INC.
Pacific Gas and Electric Co. Nuclear Station, Diablo Canyon, Cal.

is hereby authorized to use the "NA"
symbol of The American Society of Mechanical Engineers for
Classes 1, 2, 3 & MC Field Installation of
Nuclear Components, 72 inches maximum diameter
at Diablo Canyon site, Units 1 & 2 only.

*in accordance with the applicable rules of the Boiler and Pressure
Vessel Code of The American Society of Mechanical Engineers.
The use of the Code symbol and the authority granted by this
certificate of authorization are subject to the provisions of the
agreement set forth in the application. Any construction stamped
with this symbol shall have been built strictly in accordance with
the provisions of the Boiler and Pressure Vessel Code of The
American Society of Mechanical Engineers.*

THIS AUTHORIZATION expires on Completion of Contract

Authorized on December 18, 1972 for

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
by the BOILER AND PRESSURE VESSEL COMMITTEE



Chairman L. P. Zick, Jr.

Secretary W. B. Hoyt



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Certificate of Authorization

Number N - 393-2

THIS IS TO CERTIFY that THE M. W. KELLOGG COMPANY;
A DIVISION OF PULLMAN, INCORPORATED; BEACH ROAD;
WILLIAMSPORT, PENNSYLVANIA 17701

is hereby authorized to use the NA
symbol of The American Society of Mechanical Engineers for
FIELD INSTALLATION OF CLASS 1, 2 & 3 COMPONENTS AT THE
DIABLO CANYON NUCLEAR POWER STATION, UNITS #1 & #2;
AVILA BEACH, CALIFORNIA ONLY

*in accordance with the applicable rules of the Boiler and Pressure
Vessel Code of The American Society of Mechanical Engineers.
The use of the Code symbol and the authority granted by this
certificate of authorization are subject to the provisions of the
agreement set forth in the application. Any construction stamped
with this symbol shall have been built strictly in accordance with
the provisions of the Boiler and Pressure Vessel Code of The
American Society of Mechanical Engineers.*

THIS AUTHORIZATION expires on OCTOBER 14, 1980

Authorized on DECEMBER 18, 1972 for
RENEWED: OCTOBER 14, 1977

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
by the BOILER AND PRESSURE VESSEL COMMITTEE



Chairman

Paul M. Briston

Secretary

W. B. Hay



THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Certificate of Authorization

Number N - 392-2

THIS IS TO CERTIFY that THE M. W. KELLOGG COMPANY;
A DIVISION OF PULLMAN, INCORPORATED; BEACH ROAD;
WILLIAMSPORT, PENNSYLVANIA 17701

is hereby authorized to use the EPT
symbol of The American Society of Mechanical Engineers for
FIELD FABRICATION OF CLASS 1, 2, 3 & MC COMPONENT PARTS &
APPURTENANCES AND CLASS 1, 2 & 3 PIPING SUBASSEMBLIES AT
THE DIABLO CANYON NUCLEAR POWER STATION, UNITS #1 & #2;
AVILA BEACH, CALIFORNIA ONLY

in accordance with the applicable rules of the Boiler and Pressure
Vessel Code of The American Society of Mechanical Engineers.
The use of the Code symbol and the authority granted by this
certificate of authorization are subject to the provisions of the
agreement set forth in the application. Any construction stamped
with this symbol shall have been built strictly in accordance with
the provisions of the Boiler and Pressure Vessel Code of The
American Society of Mechanical Engineers.

THIS AUTHORIZATION expires on OCTOBER 14, 1980

Authorized on DECEMBER 18, 1972 for
RENEWED: OCTOBER 14, 1977

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
by the BOILER AND PRESSURE VESSEL COMMITTEE



Chairman

Paul M. Briston

Secretary

Wes Hays

ATTACHMENT 1



1700 DELL AVENUE

CAMPBELL, CALIFORNIA 95008

TELEPHONE (408) 446-2500
TWX 910-590-2438

October 24, 1977

NSC-QAS-KEL-003

JW-77-072

Mr. Edward F. Gerwin
Chief Engineer/Quality Assurance Manager
Pullman Power Products
Post Office Box 1007
Williamsport, Pennsylvania 17701

Subject: Audit Report of Diablo Canyon Effort

Dear Mr. Gerwin:

The audit, conducted under your cognizance, of the Diablo Canyon work effort has been completed and is documented in the attached audit report.

Section VI, "Summary," of the audit report contains the audit team's overall evaluation and conclusions concerning the work performed at Diablo Canyon. To facilitate corrective actions, as much detail and as many specifics as possible have been included in the audit report, which accounts for the length of the report. If any additional details are required, do not hesitate to call me.

It is my understanding that information to confirm the disposition of the audit findings by Pullman Power Products and eventually by Pacific Gas and Electric Company will be transmitted to me. As we discussed, a copy of the letter transmitting the audit report from Pullman Power Products to Pacific Gas and Electric Company will be sufficient to confirm your disposition. The precise method of verifying Pacific Gas and Electric Company disposition was not defined, but you did commit to requesting that Pacific Gas and Electric Company send me a copy of any official communications concerning their actions relative to the audit. I trust that you have been able to obtain Pacific Gas and Electric Company's concurrence.

In behalf of the audit team, I would like to express my appreciation to all the Pullman Power Products personnel for their cooperation and to you for your personal attention and involvement in the audit.

Very truly yours,

A handwritten signature in cursive script that reads "Jack Weber".

Jack Weber
Audit Team Leader

Attachment

AUDIT REPORT
PULLMAN POWER PRODUCTS
WORK SCOPE AT THE
DIABLO CANYON SITE

August 22 through September 20, 1977

I. INTRODUCTION

A. Audit Scope and Purpose

A quality assurance audit was performed on the Pullman Power Products work scope at the Diablo Canyon site. The purpose of the audit was to evaluate the performance of the Pullman Power Products Diablo Canyon Site Organization with respect to the Quality Program and contract requirements. The audit was performed under the cognizance of Mr. E. F. Gerwin, General Manager, Quality Assurance, Pullman Power Products and, as such, was an independent, internal audit of the Pullman Power Products Diablo Canyon work scope.

The scope of the audit included the following:

- (1) The organizational arrangement and the independence of the quality organization.
- (2) The qualifications and certifications of personnel performing the work.
- (3) The Quality Assurance Program, including the procedures and instructions by which the work is accomplished.
- (4) The implementation of the Quality Assurance Program.
- (5) The systems by which deficiencies are found, reported, tracked, and corrected.
- (6) The records and documentation system.
- (7) The workmanship of the field-fabricated and installed items.
- (8) The status, adequacy, and effectiveness of receiving inspection, warehousing, installation, welding, heat treating, NDE, installation inspection, testing, and records functions for installed

and erected piping, field-fabricated piping (\leq 2-inch diameter), piping supports, piping snubbers, piping restraints, weld rod, and material (excluding the Primary Coolant System) examined by nondestructive testing, as appropriate.

The audit was performed by identifying each system or program that is used to control the work effort and sampling those systems or programs until a conclusion could be reached concerning the adequacy or inadequacy of that system or program.

The Pullman Power Products effort at Diablo Canyon was initiated in 1971, based on the contractual agreement of May 1970 between Pullman Power Products and Pacific Gas and Electric Company.

During the time period of 1971 to the present, the requirements relative to the Pullman Power Products work scope have changed. The audit scope and purpose were to evaluate the Pullman Power Products work effort against the codes and standards in effect at the particular time that the work was being performed. When requirements are issued, there is always some room for interpretations concerning what is an acceptable method of satisfying these requirements. During the 1971 to 1974 time period, a number of ANSI standards were promulgated to define acceptable methods of satisfying 10 CFR 50, Appendix B. It is required that organizations revise their quality programs to satisfy present interpretations. In areas requiring interpretation, the quality of the work effort at Diablo Canyon was measured against the current ANSI standards and Regulatory Guides, accepted today as valid interpretations of regulatory requirements. The long time span and the specific time interval during which the work effort was conducted should be considered when reading this audit report.

B. Audit Team

The audit team consisted of the following Nuclear Services Corporation personnel:

Jack Weber, Audit Team Leader

G. J. Larsen

T. C. Newman (part-time)

G. W. Rowe

C. Audit Report

The audit report is divided into six parts: Section I, "Introduction"; Section II, "Audit Preparation"; Section III, "Entrance Interview"; Section IV, "Audit Findings"; Section V, "Exit Interview"; and Section VI, "Summary." Corrective actions will be determined by the appropriate Pullman Power Products personnel upon receipt and review of this audit report.

II. AUDIT PREPARATION

A series of meetings were held in which the following tentative schedule was established:

- Preparation of checksheets
- Receipt and review of Pullman Power Products Quality Program documents and contractual commitments to Pacific Gas and Electric Company
- Finalization of checksheets
- Entrance interview
- Audit of Organization, Personnel Qualification and Certification Program, Document Control, Nonconformance Program, Auditing Program
- Feedwater Systems, Unit 1 and Unit 2
- Main Steam System, Unit 1
- Chemical and Volume Control System, Unit 2
- Residual Heat Removal System, Unit 1
- Safety Inspection System, Unit 1
- Containment Spray System, Unit 1
- Component Cooling Water System, Unit 1

The schedule was changed to meet the progress and findings of the audit, but the full scope of the audit was achieved.

III. ENTRANCE INTERVIEW

An entrance interview was held August 16, 1977, at the Diablo Canyon site to introduce the audit team. In attendance at the entrance interview were:

Jerry Arnold	Pacific Gas & Electric Co.	Diablo Canyon Site Quality Assurance Coordination
Al Eck	Pullman Power Products	Quality Engineer, Central Staff
Rick Etzler	Pacific Gas & Electric Co.	Lead Mechanical Engineer
Gerry Larsen	Nuclear Services Corporation	Auditor
Bill Rowe	Nuclear Services Corporation	Auditor
Pete Runyan	Pullman Power Products	Field Quality Assurance Manager
John Ryan	Pullman Power Products	Resident Construction Manager
Mike Tressler	Pacific Gas & Electric Co.	Station Superintendent
Jack Weber	Nuclear Services Corporation	Audit Team Leader

During the entrance interview, a discussion was held of the progress and problems associated with the Pullman Power Products effort and the present status of the work effort. The scope and schedule of the audit were discussed, and agreement was reached to perform the audit in accordance with the schedule presented in Section II above.

Mr. J. P. Runyan, Field Quality Assurance Manager, Pullman Power Products, and his staff were designated as the audit team contacts.

IV. AUDIT FINDINGS

The audit findings are divided into the 18 sections consistent with 10 CFR 50, Appendix B. The audit findings are given to present the status of the program and, therefore, include both the acceptable and unacceptable areas detected during the audit.

Criterion 1. Organization

1. A current organizational chart does exist.
2. Procedures KFP-1 and KFPS-1 do describe the quality organization, as well as some of the functional responsibilities of the quality organization.
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.
4. Procedures KFP-4, KFPS-4, KFP-6, KFPS-5, KFP-8, KFPS-7, KFP-9, and KFPS-8 do describe some of the responsibilities of the Field Engineering Organization. The responsibilities of the other Field Construction Organizations are not described, nor are the full responsibilities of the Field Engineering Organization described.
5. The descriptions of individual position responsibilities are inadequate. Some elements of position descriptions exist in the KFP and KFPS procedures, and job descriptions exist for inspection and inspection technician positions. No position descriptions exist for any of the upper-level site personnel.
6. The description and controls of the interfacial relationship between Pullman Power Products and Pacific Gas and Electric Company are inadequate. The contract and some Engineering Specifications do describe some interfaces and mechanisms. However, for the greatest scope of the work effort, there is little to describe how the interface will be managed and controlled. Some of the activities that

require interface control are hydrostatic testing, nonconformance reporting, meetings, work on pipe rupture restraints, work on hangers, document control, reporting of deficiencies, responses to Pacific Gas and Electric Company audits, interfaces with other Pacific Gas and Electric Company contractors that impact Pullman Power Products work, etc.

7. The description and the controls of the interfacial relationship between Pullman Power Products Field Organization and the other Pullman Power Products organizations involved in the Diablo Canyon effort are inadequate. The Quality Assurance Manual does describe some quality interfaces between the Field and Corporate Offices. However, there are no requirements for periodic reporting from the Field Quality Assurance Organization to the Corporate Quality Assurance Organization; there are no requirements for an upper-management review of corrective action reports, nonconformance reports, and personnel qualifications; the interface between the Field Organization and the Paramount shop is not described; the interface between the Resident Construction Manager and the Corporate Construction Manager is not described; the interface between Field Quality Assurance and Corporate Quality Assurance is not described with respect to field purchases and Corporate Quality Assurance auditing of those suppliers.
8. The description and the controls of the interfacial relationship between the Pullman Power Products Field Quality Assurance Organization and the other Pullman Power Products Field Organizations are inadequate. The Quality Assurance Manual and many of the Engineering Specifications describe interfaces and mechanisms. However, the interfaces relative to the construction and engineering efforts in regard to drawings approval; review of isometric, hangers, and restraint document packages; welders logs; and control of the welding process are not described.

9. The stop work authority for the Field Quality Assurance Organization is not adequate. Procedure ESD-240 does describe the stop work authority for Hold Tags, but there are no mechanisms described or authority addressed for the circumstances when the Construction Organization elects to proceed through a Hold Tag stop.
10. The Field Quality Assurance Organization does report to a sufficiently high level of management.

Criterion II. Program

1. The contract between Pullman Power Products and Pacific Gas and Electric Company was signed in May 1970, prior to the enforcement of 10 CFR 50, Appendix B. The contract did contain certain quality aspects that were requirements for the Pullman Power Products work effort. Work was not initiated on the Diablo Canyon site until late 1971, when Appendix B had become a requirement [Appendix B was added to 10 CFR 50 on June 17, 1970, effective July 27, 1970 (35 FR 10498), and amended September 11, 1971, effective October 11, 1971 (36 FR 18301)]. Even though the contract was not amended by Pacific Gas and Electric Company to include Appendix B as a requirement, Pullman Power Products was obligated to conform to Appendix B requirements; and the total quality program was evaluated against Appendix B and ANSI N45.2. While a written Quality Assurance Program exists, the program does not meet the requirements of 10 CFR 50, Appendix B or ANSI N45.2. The specific inadequacies of the program are described throughout the findings.
2. There is no description of the overall Quality Assurance Program. Special Quality Assurance Instructions are not described; the relationship and purposes of the KFPS, KFP, and ESD procedures are not described; the Pipe Support Quality Assurance Manual is not described; and the relationship of the Pipe Support Quality Assurance Manual to the balance of the Quality Assurance Program is not documented.
3. Procedures KFP-1 and KFPS-1 do provide a broad and generalized description of the scope and applicability of the Quality Assurance Program. These procedures also reference the contract between Pullman Power Products and Pacific Gas and Electric Company. However, the total scope and applicability of the Quality Assurance Program are not adequately described. The efforts relative to pipe rupture restraints, receiving and control of materials and components other than Pullman Power Products-procured, and the work associated with anchor bolts are not adequately described.

4. There is no evidence that upper management has performed scheduled reviews of nonconformance reports, personnel qualifications, and corrective actions.
5. There is evidence that upper management has performed reviews of audit reports generated by Pullman Power Products and Pacific Gas and Electric Company.
6. The indoctrination and training program requirements for personnel involved in inspection activities are adequate. Procedures KFP-2, KFP-3, KFPS-2, and KFPS-3 require training of NDE personnel; Procedure ESD-237 specifies a training program for the NDE personnel; Procedure ESD-237 also describes a training program for Quality Assurance Field Inspectors.
7. The indoctrination and training program requirements for personnel involved in quality-related activities are inadequate. There is no requirement for indoctrination and training of welders, foremen, engineering personnel, warehousing personnel, etc.
8. There is no evidence that personnel have been trained to assure their familiarity with the procedures they are responsible for implementing, except for welders, who have been trained and qualified to specific weld procedures.

Criterion III. Design Control

1. There is no design manual for the preparation of isometrics and field fabrication drawings.
2. Procedure KFPS-4 provides adequate control of the pipe support design effort.
3. Procedure KFP-4 requires that the Chief Field Engineer and the Field Quality Assurance/Quality Control Manager review field changes to Pacific Gas and Electric Company-approved drawings and specifications for ASME Code compliance. No written procedure for this review exists.
4. A mechanism does exist for checking and reviewing Pullman Power Products drawings. However, this mechanism is not described in a written procedure. Documentation of the implementation of this informal procedure does exist.
5. The isometrics and field fabrication drawings do indicate the classification of systems.
6. Procedure ESD-205 does contain a classification of systems and the requirements for each classification.
7. The changes to isometric drawings and field fabrication drawings are indicated on the documents, as well as the reason for the change. Procedure KFP-9 establishes a mechanism to permit tracking of all revisions, i.e., the Chief Field Engineer is required to maintain a copy of all voided drawings.
8. Procedure KFPS-8 requires the Chief Field Support Engineer to assure that all supports are fabricated to the latest drawing revision. No mechanism exists to comply with this requirement.

Criterion IV. Procurement Document Control

1. Procedures KFP-6 and KFPS-5 adequately describe the responsibilities associated with field purchase order processing.
2. Procedure ESD-226 adequately describes the quality requirements for purchase specifications of the usual Pullman Power Products scope of purchased materials.
3. Procedures KFP-6 and KFPS-5 do not require that the purchase order state that Pullman Power Products is given the right to audit the subcontractor shop.
4. No written procedure permits verification of the selected supplier as one identified on the Pullman Power Products corporate-approved vendors list.
5. There is no mechanism by which Pullman Power Products Corporate is informed of the procurement of safety-related parts, components, equipment, and material to assure that the selected supplier is placed on the Corporate audit schedule.

Criterion V. Instructions, Procedures, and Drawings

1. There is no requirement that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings.
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.
3. Many activities affecting quality are insufficiently described in procedures. Among those activities are: isometric package review, post-welding heat treatment, nonconformance reporting, Ninety-Day Welders' Logs and Weekly Qualified-Welders Lists, and auditing.
4. The present procedures are generally inadequate for providing direction to those performing the work. The procedures do not follow the flow of the work; many procedures are very long (over 10 pages); insufficient information is given; important information is not provided or referenced in the procedure.

Criterion VI. Document Control

1. Procedures KFP-9 and KFPS-8 are adequate for field drawing control, and Procedure ESD-253 is adequate for pipe-support drawing control.
2. Procedures KFP-17 and KFPS-15 are adequate for control of the KFP and KFPS procedures and are appropriately implemented.
3. There is no procedure for control of ESD procedures.
4. There is no procedure for control of Special Quality Assurance Instructions.
5. The Pullman Power Products review of completed packages relative to hangers and pipe restraints is not detailed in a procedure, nor is ESD-254 complete as to what is actually done for the isometric package. Procedure ESD-254 does describe some aspects of "Piping System Documentation Review."
6. The Pullman Power Products log, Drawing Control Index (KFP-9 and KFPS-8), is maintained in a nonpermanent manner. The log is filled out in pencil; and when the number of revisions exceeds the available space, the early revisions are erased to accommodate the new revision.
7. No mechanism assures that the Pacific Gas and Electric Company drawings being used as the reference drawings are the latest-issued revision. Audits are frequently performed to determine that Pullman Power Products has the latest Pacific Gas and Electric Company drawings. However, the audit mechanism is not satisfactory when it is the only mechanism.
8. There is no Weld Rod Requisition for one of the welders who participated in FW-345 of isometric 04-500-139.

9. There is evidence that documents have been backdated and changed to meet requirements without any substantiation of the information.

- For Isometric 2-14-47: 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.
- 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.
- Isometric 2-14-53: FW-247 was completed February 20, 1975. Approximately December 1, 1975, the visual acceptance was signed off and backdated; and the Weld Rod Requisition was changed to show that more than the original quantity of one had been burned.
- 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.
- 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.

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.

11. Procedures KFP-14, KFPS-12, ESD-239, and ESD-254 are adequate instructions to assure that the correct documentation has been assembled and the system is ready for turnover.

Criterion VII. Control of Purchased Material, Equipment, and Services

1. The interface between the Pullman Power Products Field Organization and the Pullman Power Products Corporate Organization relative to selection and monitoring of suppliers' fulfilling field purchase requisitions is inadequate.
2. Procedures KFP-7, KFPS-6, ESD-217, ESD-226, and ESD-261 are adequate for the performance of receiving inspection.

Criterion VIII. Identification and Control of Materials, Parts, and Components

1. Identification and control of piping and valves are adequately specified by Procedures ESD-200 and ESD-201.
2. Identification and control of weld material are adequately specified by Procedures KFP-12, KFPS-11, and ESD-202.
3. Identification and control of backing gas dams are adequately specified by Procedure ESD-214.
4. Procedures KFP-8 and KFPS-7 are adequate for specifying that the identification of parts and components is to be recorded on the Field Process Sheet. The implementation of this procedure is adequate.
5. The isometric drawings and field fabrication drawings are the major documents for recording the identification of the parts, spools, and components. While there is no procedural requirement, this mechanism has been followed and is an excellent technique.
6. Identification of welds and welders is adequately described in Procedures ESD-203, -204, -221, and -243.
7. Proper methods of marking are specified in Procedures ESD-200, -201, -202, -203, -204, -221, -223, and -243.
8. Material control techniques for temporary pipe attachments are adequately described in Procedure ESD-232.
9. Procedure ESD-248 adequately describes controls for the repair of installed valves and for valve parts control.
10. Adequate control of snubbers, plate, and other components is achieved by using Procedures ESD-200, ESD-201, KFP-8, KFPS-7, and the practices associated with field drawing preparation. However, no procedures specifically address these items.

11. Procedure KFP-20 provides an adequate mechanism to control nuts, bolts, etc.
12. Procedure ESD-223 does not give adequate instructions for the identification and control of Class I Pipe Supports.
13. Procedure ESD-228 does provide adequate guidance for the marking of tools used in grinding stainless and carbon steel welds.

Criterion IX. Special Processes

1. Nondestructive examination has been properly specified as a special process. Procedures KFP-3, KFPS-3, ESD-235, and ESD-256 adequately specify requirements for NDE personnel.
2. The requirements for Field Quality Assurance Inspectors are adequately specified in Procedures ESD-237 and ESD-256.
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. G. 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.
4. NDE procedure qualification is adequately described in Procedures KFP-2 and KFPS-2 as being the responsibility of the Manager of Quality Assurance, Williamsport Headquarters.
5. Welding has been properly specified as a special process.
6. Welding procedure qualifications are adequately described in Procedure KFP-15 as being the responsibility of the Welding Engineer (Williamsport).
7. Procedures KFP-15, KFPS-13, and ESD-216 are adequate for specifying welder qualifications.

8. The certification of the following welders, by weld symbol, was examined and found acceptable: U, AN, IH, PO, VD, QZ, HY, PD, JL, ET, HL, AY, MO, TQ, IQ, PG, KP, XC, FC, and ZC.
9. The certification of welder U was not signed.
10. A number of procedures provide mechanisms for control of the welding process: ESD-203, -204, -215, -219, -221, -225, -227, -242, and -243. However, the control of the welding process has been inadequate as follows:
 - Records of welder qualifications prior to 1972 are not available.
 - 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.
 - 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.
 - 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.
 - No procedure specifies who is responsible for the Ninety-Day Welders' Log, the Weekly Qualified-Welders List, or the Welder's Qualification Card; how the information is obtained; how the logs are used; to whom they are distributed; etc.

- 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.
- 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, -91, -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 DRs 2536, 2538, 2539, and 2899. In accordance with Pacific Gas and 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.
- Procedure ESD-219 requires random sampling of inprocess 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.
- 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.
- 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.

- Hangers are not welded in accordance with Pacific Gas and Electric Company requirements. Hangers 2023-1V 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.
- 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.
- 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.
- There is no procedure for the preheating of weld joints.
- The initial results of the welding auditing (from November 5, 1973, to February 1974) indicate that the following problems existed:
 - * The welders did not understand shielding and purging.
 - * Tempil sticks were not used.
 - * Amperages were not within procedure limits (mainly root

welds and tack welds.

- * Weld procedures were not available, and many welders did not know where to obtain them.
- * The oxygen analyzer was not available or not operative. Also, the time vs flow rate alternate technique was not used.
- * Oven rod temperature control was not monitored by the welders.
- * 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.

11. Welding procedures for carbon steel welding require preheat and inter-pass temperatures for material that has a carbon content in excess of 0.30 percent and a thickness of one inch or more. There is no mechanism by which the welder can determine carbon content.
12. Procedure ESD-221 does provide adequate guidance on weld repairs.
13. Heat treating has been identified as a special process in the Pacific Gas and Electric Company contract (as well as in Appendix B), but it has not been controlled as a special process by Pullman Power Products.
14. Procedures KFP-13 and ESD-218 provide controls of the post-weld heat treatment process. The implementation of Procedure ESD-218 is acceptable.
15. Cleaning has not been identified as a special process.

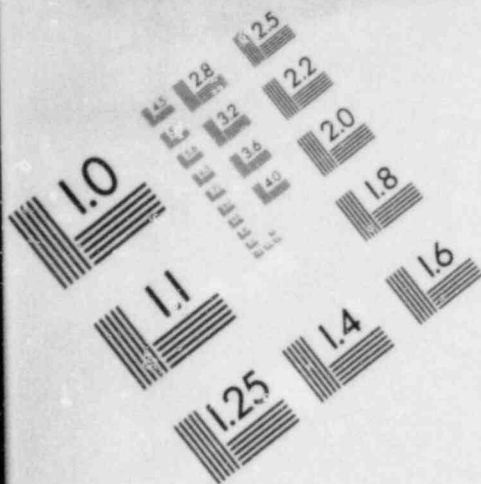
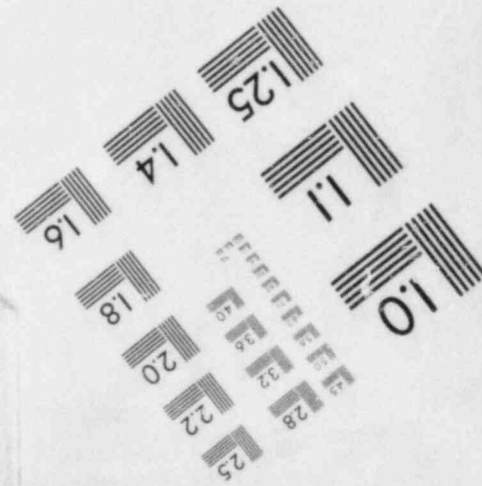
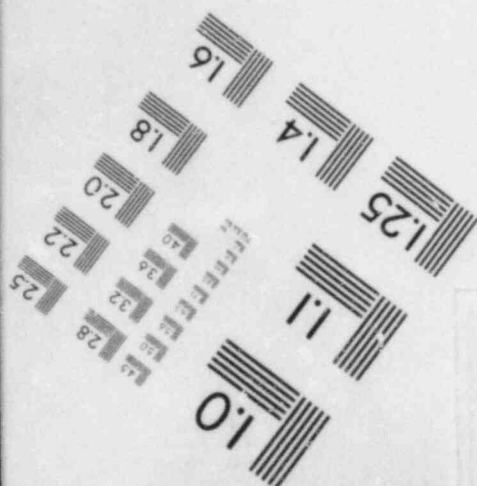
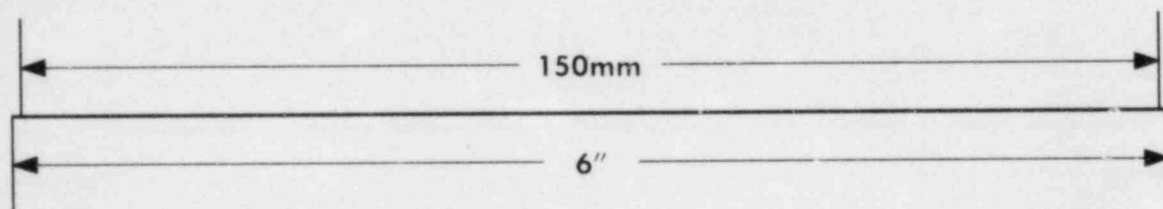
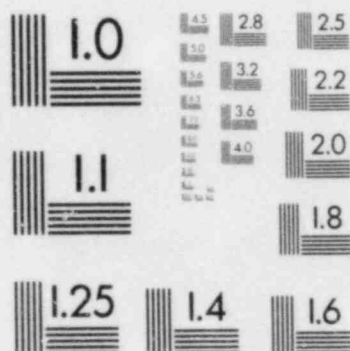
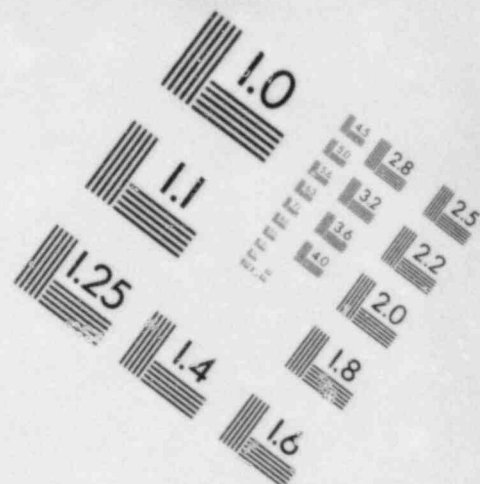


IMAGE EVALUATION
TEST TARGET (MT-3)



16. Procedures ESD-220, -224, -238, -242, -252, -258, -259, and -261 provide adequate guidance in cleaning and cleanliness of the various materials, parts, and components.
17. Procedure ESD-231 provides some guidance on hot and cold bending of small bore piping. The guidance is considered insufficient to assure that the bending is done properly to avoid high stresses and thinning of the wall.
18. Procedure ESD-238 provides adequate instruction in torquing of bolting for pipe flanges.
19. Procedure ESD-259 provides adequate instruction for installing Grinnell Snubbers.
20. Procedure ESD-224 provides excellent instruction for assembly and torquing of installed valves.
21. Procedure ESD-260 provides adequate instruction for installation of Williams Rock Bolts.
22. Procedure ESD-230 provides good instructions for entering an installed line.

Criterion X. Inspection

1. Procedures KFP-5, -8, and -14 thoroughly describe the interface between Pullman Power Products and the Authorized Inspector.
2. Procedures KFP-8 and KFPS-7 provide the requirements for the Field Process Sheet, which specifies inspection points and inspector sign-off.
3. The Field Process Sheet references procedures to which the work and the inspections will be performed.
4. The inspection procedures are detailed in Procedures ESD-206, -207, -208, -209, -210, -211, -215, -219, -225, -233, -234, -236, -241, -243, -244, -249, -250, -251, -255, -259, and -260. These procedures are, in general, broad descriptions of the inspection process for the total range of the work scope and are adequate for that purpose.
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).
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.
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.

8. For FW-110 (isometric package 2-14-31), the Process Sheet indicates that MT was performed; however, the inspection sheet for PT shows that weld number, and the inspection sheet for MT does not show that weld number.
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.
10. Isometric package 1-03-i has a step that requires a Pullman Power Products inspector sign-off. This requirement was removed, and the step was accepted by a Pacific Gas and Electric Company employee.

Criterion XI. Test Control

1. Procedure ESD-229 adequately defines the methods and inspections relative to performing hydrostatic tests.
2. There is no description of the responsibilities of Pacific Gas and Electric Company or of the Pullman Power Products/Pacific Gas and Electric Company Interface relative to hydrostatic testing.
3. Procedure ESD-229 is not adequate for describing the flow and authorities relative to the individual hydrostatic test procedures to be performed.
4. Hydrostatic test packages 7-2, 7-2A, 8-12, 9-12, 106, 106A, 106B, and 64 were examined and found acceptable.
5. The B31.1 and B31.7 Codes require that all piping be 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 and Electric Company. Classes D, E special, and E piping is not being leak-tested. A letter from Pacific Gas and Electric Company (dated January 13, 1976) does exist, which states that Pacific Gas and 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.

Criterion XII. Measuring and Test Equipment

1. Procedures KFP-11, KFPS-10, and ESD-213 describe an adequate calibration program.
2. 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.
3. The calibration program has not been adequately implemented.
 - Paragraph 11.5 of Procedure KFP-11 and Paragraph 10.5 of Procedure KFPS-10 require reinspection of materials and components if the measuring and test equipment is found to be out-of-calibration. Except for hydrostatic testing and heat treating, the identity of measuring and test equipment is not related to the inspections performed.
 - Procedure ESD-213 does not contain a mechanism to report out-of-calibration measuring and test equipment to Pullman Power Products. Some forms used by the calibration subcontractors only contain provisions for attesting to calibrating the equipment to appropriate standards and have no provisions for recording the actual values obtained.
 - The calibration records of recorders were confused by having two recorders identified on one record, and the acceptability of the records could not be determined.
 - 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.

- Magnetic Particle Test Equipment Y-6 has no documentation to verify calibration.
- There is no documentation available to verify calibration of "Tong Test" ammeters.
- "Tong Test" ammeter TT2527403 was out of calibration for the period December 12, 1976, to January 31, 1977. No DR has been written against that instrument.
- Storage requirements for instruments are not specified.

Criterion XIII. Handling, Storage, and Shipping

1. Procedures ESD-202, -215, -217, -222, -223, -240, -259, and -261 provide some information relative to handling and storage of materials, parts, and components for the total scope of the Pullman Power Products effort.
2. Procedures for storage are generally inadequate. Procedures ESD-222, "Control Valves," and ESD-202, "Weld Material Withdrawal and Control," are specific and adequate. Procedure ESD-215, "Visual Inspection," provides some guidance on storage. There is very little information relative to how specific items are to be stored or the delineation of storage areas relative to the protection each area provides.
3. Procedure ESD-240 requires a segregated storage area for "scrap" material, and Procedure ESD-215 requires separate areas for material with Hold Tags and for P1 and P8 material separation. These procedures are adequate. However, they do not relay much information on how these segregated areas are to be established and maintained segregated.
4. There are no procedures or manufacturers' instructions for the storage of flow indicators and strainers, which were stored in the Pullman Power Products storage area.
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-239 has excellent detail as to the handling of Grinnell Snubbers during installation. However, Procedure ESD-259 was issued January 27, 1977; and there is no 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.

6. The present storage areas were found to be in excellent condition, with areas clearly defined, materials supported on adequate dunnage, and openings capped.
7. Procedures KFP-19, KFPS-17, and ESD-222 provide for an adequate storage surveillance program. Prior to October 31, 1973, the surveillance was performed using a checksheet that contained the storage requirements; after October 31, 1973, the checksheet was changed so that the storage requirements were not listed. While the surveillance program appears adequate, the checksheet used after October 31, 1973, does not appear adequate.

Criterion XIV. Inspection, Test, and Operating Status

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 O_2 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.
2. The Hold Tag mechanism described in Procedure ESD-240 is an acceptable method of exhibiting status when a defective or discrepant condition is noted.
3. The method of using the Field Process Sheet, the Hold Tag, and the Discrepancy Report is an acceptable mechanism to track the status of a discrepant condition and the final disposition of that condition. However, the mechanism is not always utilized.
 - DMR-604, dated February 14, 1973, for Isometric package 1-03-1 required rework and reinspection of 14 Class B welds. There are no Field Process Sheets or Inspection Reports to demonstrate that the work had been performed.
 - The Field Process Sheet for FW-347 states that the weld was cut out in accordance with a specified DR. The referenced DR is not applicable to cutting out FW-347.
4. The method of indicating repair welds, as described in Procedures ESD-203 and -204, and the notation of repair welding on the Field Process Sheet are acceptable for showing repair status. However, FW-83 (Isometric Package 1-10-9) and FW-348 (Isometric Package 04-500-

139) were not stamped "R" to indicate repair.

5. Procedures KFP-8 and ESD-239 do present some information relative to the release of the systems for hydrostatic testing. Procedure ESD-229 does contain a method of indicating hydrostatic test status. These mechanisms are acceptable. Procedure ESD-229 should reference Procedure ESD-239 and require that the release be confirmed prior to initiation of the testing.
6. Paragraph 8.12 of Procedure KFP-8 requires that the Field Process Sheet be maintained in the area where the line is being installed. This requirement has been interpreted as having the Field Process Sheet in the area inspectors' station and not as being available to the foremen and the people performing the work while the work is in progress. This practice causes the Field Process Sheet to become an inspection sign-off record, rather than a traveler that presents necessary information to all individuals involved in the performance of the work.
7. Paragraph 7.2 of Procedure KFPS-7 requires that the foreman or pipe-fitter procure a drawing and Process Sheet prior to starting work and check off operations as completed. There was no evidence that this practice (which is in conflict with KFP-8) is observed.

Criterion XV. Nonconforming Materials, Parts, or Components

1. Procedures KFP-10, KFPS-9, and ESD-240 describe an adequate system of identifying nonconformances.
2. Procedure ESD-240 does not adequately describe the actual process by which Nonconformance and Discrepancy Reports are processed.
3. The Pullman Power Products/Pacific Gas and Electric Company interface relative to Discrepancy Reports is not described.
4. Procedure ESD-240 does contain adequate information relative to disposition and close-out (use of logs) for Nonconformance and Discrepancy Reports.
5. Systems that circumvent the nonconformance system have been established. Use of Note-O-Grams and Rejection Notices to denote discrepancies usually precludes their pick-up on a subsequent NR or DR. The use of these alternate systems removes the controls and reviews that have been integrated into the NR and DR system and also prevents information relative to the number and types of problems from being identified. These alternate systems are unacceptable.

Criterion X Corrective Action

1. Procedures KFP-10, KFPS-9, and ESD-240 describe a corrective action system. The corrective action system is inadequate in that it does not require:
 - Categorization of reported discrepancies to permit evaluation and tracking.
 - Documentation of all discrepancies.
 - Inclusion of documented discrepancies in the NR and DR system, i.e., discrepancies reported in Note-O-Grams are not subsequently written as a NR or DR.
 - Tracking of discrepancies to determine which discrepancies are recurring.
 - Analysis of discrepancies to determine programmatic problems.
 - Reporting of significant conditions adverse to quality and the corrective actions taken to appropriate levels of management.
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.
3. There is no procedure for reporting 50.55(e) deficiencies.

Criterion XVII. Quality Assurance Records

1. Procedures KFP-16 and KFPS-14 and most of the ESD procedures adequately identify the records to be retained.
2. Procedures KFP-14 and KFPS-12 provide adequate guidance and mechanisms to assure collection of most records. Records that are not specified in these two procedures (e.g., records on heat treatment, torquing, pipe rupture restraints) do not have any documented mechanisms for collection, but are adequately assembled and retained.
3. There are no procedures for filing, storing, and protecting records, i.e., no requirements for the vault, no method on how records other than isometric packages are identified, no instructions on how records are to be stored. However, the practices employed do provide for adequate identification, retrieval, and fire protection.
4. Procedure ESD-212 does adequately describe a security system that provides "out" cards for identification of the record and the individual using the record and for the overall security of the records within the vault.

Criterion XVIII. Audits

1. Procedures KFP-18, -19, -21; Procedures KFPS-16, -17, -18; and Procedures ESD-219 and -222 describe an adequate audit program.
2. The audit program does not require the use of checksheets or procedures to delineate the scope and extent of the audit, nor does it require that the audit team leader be qualified.
3. In response to KFP-18, Paragraph 18.2.1, management audits were performed approximately every six months. Checksheets were employed. Based on the results of this audit and the results of Pacific Gas and Electric Company audits, these management audits appear to have been ineffectual.
4. Procedure KFPS-16 does not require management audits.
5. In response to KFP-18 and KFPS-16, internal audits were performed every six months. Checksheets were not employed.
6. There are no procedures for audit reports, audit responses, and time limitations on responses.
7. Procedures KFP-18 and KFPS-16 require that a copy of the audit report be transmitted to the Manager of Quality Assurance.
8. There are no requirements that the Manager of Quality Assurance track the audit reports or take any corrective actions when programmatic or recurring deficiencies are noted.
9. There are no requirements for periodic, independent, internal audits of the total quality program.
10. One independent internal audit was performed in January 1976.

V. EXIT INTERVIEW

The exit interview was conducted on September 20, 1977, at the Pullman Power Products offices at Diablo Canyon. In attendance at the exit interview were:

Jack Bowes	Pullman Power Products	Vice President, Production
Ed Gerwin	Pullman Power Products	General Manager Quality Assurance
John Ryan	Pullman Power Products	Resident Construction Manager
Pete Runyan	Pullman Power Products	Field Quality Assur- ance Manager
Chris Scannell	Pullman Power Products	Chief Field Engineer
Al Eck	Pullman Power Products	Quality Engineer, Central Staff
John Mitchell	Pullman Power Products	Consultant
Sherman Naymark	Nuclear Services Corporation	President
Jack Weber	Nuclear Services Corporation	Audit Team Leader
Bill Rowe	Nuclear Services Corporation	Auditor
Gerry Larsen	Nuclear Services Corporation	Auditor

The exit interview was initiated by Mr. Weber's summarizing of the purpose and scope of the audit, the basis against which the Pullman Power Products effort was measured, and the purpose of the exit interview. Additionally, a discussion was held on the fundamentals of auditing, i.e., an audit is a sampling technique, that enough samples are taken from each program or system to draw a conclusion, and that the conclusion is then applied to the adequacy of that program or system.

Each audit finding was presented, and discussions were held to clarify or refute the findings. Some findings were modified, based on additional evidence presented by Pullman Power Products. Upon completion of the

presentation of the audit findings, an overall summary of the findings was presented.

VI. SUMMARY

The Pullman Power Products Diablo Canyon effort has extended from 1971 to the present. The findings indicate that there were three distinct periods as related to the quality of the work. These findings are:

- Prior to early 1974, there is little evidence available to verify the adequacy of the work performed. The available evidence indicates that only a rudimentary quality control program existed and that control over the production organization was minimal.
- From early 1974 to late 1974, there is evidence available to verify the adequacy of the work performed. The available evidence indicates that control was achieved of the materials control program and the welding control program.
- From late 1974 to the present, an increasing amount of documentation and records has been generated to verify the adequacy of the work performed. The available evidence demonstrates that an increasingly more stringent quality program has been placed into effect and increasingly greater control of the work effort has been achieved. However, the present program and controls still do not meet 10 CFR 50, Appendix B requirements in those areas as delineated in Section IV of the audit report.



Jack Weber
Jack Weber, Audit Team Leader

G. J. Larsen P.E. N-310 CALIF.
G. J. Larsen, Auditor

T. C. Newman
T. C. Newman, Auditor

G. W. Rowe
G. W. Rowe, Auditor

4

ATTACHMENT 2

P O Box 3308, Resch Road
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Telephone (717) 323-9991
Telex 841416
Cable Pipelog Williamsport

Pullman Power Products

April 11, 1978

Pacific Gas & Electric Company
77 Beale Street
Room 2505
San Francisco, California 91405

Attention: Mr. R. Bain

Subject: Pacific Gas & Electric Company
Diablo Canyon - Units 1 & 2
NSC Audit of August 22 through September 20

Dear Mr. Bain:

Nuclear Services Corporation conducted an audit of the piping installation work at Diablo Canyon Units 1 & 2 at the request of Pullman Power Products, Division of Pullman Incorporated.

After receipt of the NSC Audit Report, we prepared a preliminary draft of proposed responses and corrective actions for review by our field site personnel. Their comments and suggestions have been reviewed and considered.

Attached for your review is the NSC Audit Report and our responses and proposed corrective action for each finding.

You will note in our Observations that we were not entirely satisfied with the direction of the audit. As a result, we have had home office personnel conduct in-depth audits of the installation from January through March of this year. These reports are filed at site. There were no significant findings.

After you have had an opportunity to review this report, we would be pleased to meet with you to consider future actions you may consider necessary.

Sincerely yours,

E. F. Gerstein
E. F. Gerstein
Director of Quality Assurance

EFG/kal

Att.

cc: E. Manning (Home Office File) w/att.
J. P. Runyan (Site File) w/att.
T. D. Landale
S. Handler
J. E. Bowes
J. Ryan

RSB

DAB

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PACIFIC GAS & ELECTRIC COMPANY
DIABLO CANYON UNITS 1 & 2

AUDIT OF PULLMAN POWER PRODUCTS
INSTALLATION WORK

1. INTRODUCTION

As a result of a meeting between PG&E and Pullman Power Products representatives in early July, 1977, an independent audit of the Pullman Power Products installation activities at Diablo Canyon - Units 1 & 2 was conducted.

The auditing was subcontracted by Pullman Power Products to Nuclear Services Corporation of Campbell, California. Nuclear Services Corporation was selected by mutual agreement between PG&E and Pullman.

The purpose of the audit was to verify that the installation met all the requirements of the applicable contract specifications and drawings.

The audit was conducted during the period from August 22 through September 20, 1977.

2. AUDIT RESULTS

A copy of the NSC Audit Report was received by Pullman Power Products October 27, 1977. This report is attached as Appendix "B" to this document.

3. AUDIT RESPONSE

The Pullman Power Products response is attached as Appendix "A".

For each finding, Pullman has reviewed the item in depth and prepared a suitable response. Where corrective action is required, the corrective action which has been, or is to be taken, is defined.

For ease of review, the audit finding from Appendix "B" has been copied verbatim. It is immediately followed by the Pullman response and corrective action where applicable.

4. OBSERVATIONS

- a. Although one of the major purposes of the audit was to verify the adequacy of the workmanship of field fabrication and installation against the contractual obligations, very few of the findings cite discrepancies in this area. This could be interpreted as a vote of confidence in the physical installation but NSC does not so state.
- b. NSC points out that auditing is a sampling procedure and that opinions are based on the number of deficiencies within the sample. Unfortunately, the sample sizes and numbers of discrepancies per sample are not reported. Neither is there any indication as to whether discrepancies noted are serious or minor. Both items of information would have helped in formulating an opinion regarding the physical installation.
- c. Many findings make general statements that some procedure or control is not adequate. The specific reasons for the inadequacy are not listed, and frequently even specific procedures are not cited. Such lack of specificity makes it almost impossible to respond. Where possible, we have attempted to identify these areas to correct the alleged inadequacy. More often than not, one must conclude that personal opinion was involved.
- d. The major thrust of the audit was directed at the Pullman Quality Assurance Program.

Our original Quality Assurance Program was written to reflect the Quality Assurance requirements of the 1968 Edition of the ASME Nuclear Pressure Vessel Code, as it applied to piping. This program was modified as requested by the State of California to reflect special State requirements. It was accepted by the ASME as the site Q.A. Manual as a result of a site survey in February, 1971.

It must be borne in mind that 10CFR50 Appendix B was published subsequent to the contract date. The ANSI N45.2 documents and Regulatory Guides which were issued as specific methods for fulfilling Appendix B requirements were published for the most part during 1973 and 1974 when most of the actual work was underway.

As part of our obligation to improve the quality of our Program as a result of our greater experience as well as greater sophistication in Quality Assurance resulting from the issuance of the aforementioned documents, we revised our Quality Assurance Manual and published scores of Engineering Specifications and Quality Assurance Instructions to supplement it. No attempt was made to remodel the Manual to the Appendix "B" format. All applicable points, however, are scattered throughout the Manual, Specifications, and Quality Instructions.

No attempt was made to apply newer requirements to work completed to earlier requirements. This is not required by the NRC or the Code.

We have been audited on numerous occasions (the text of one response indicate 68 audits) by PG&E, the NRC, ASME, State of California, and one other independent auditing group. Our program has been reviewed and our work monitored by both the State of California and Hartford Steam Boiler Insurance Company, our Authorized Inspection Agencies. We recently underwent an ASME audit for renewal of our ASME Certificates with flying colors. No one has found major fault with our Quality Assurance Program.

- e. NSC, on Page 2 of the Audit Report, rightfully points out that the work has taken place over the time period from 1971 to present, and that the audit scope and purpose was to evaluate the work against Codes and standards in effect at the particular time the work was performed.

Unfortunately, in making their evaluation and conclusions, the audit team did not adhere to their own precautionary statement. The audit findings are profuse with instances where records, documents, and procedures were judged against 1977 criteria instead of those in effect at the time the work was done. This, we feel, was a great disservice to Pullman and our customer.

5. SUMMARY

- a. The NSC audit failed in fulfilling one major purpose, the verification of the adequacy of the installation.
- b. Nowhere in this report is there any indication of a finding which indicates an inadequacy in the installed work or an inadequacy in the documentation which constitutes evidence of compliance. These two basic points are totally omitted in the NSC Summary, but are most relevant in judging the quality of the installation.

We strongly disagree with the NSC Summary that prior to early 1974, there is little evidence available to verify adequacy of the work. All of the evidence exists in the form of documentation and other records which were required by the Code and Quality Assurance requirements existing at the time the work was performed.

- c. The conclusions regarding the adequacy of as-installed work should be judged against the Codes specified in the contract documents. Conclusions regarding adequacy of the Quality Assurance program should have been evaluated against practices in effect at the time the work was accomplished. Findings relative to Quality Assurance appear to be judged against current (1977) criteria.
- d. The statement that the Quality Assurance Program does not meet 10CFR50 Appendix B is an opinion only. In our opinion, the program does adequately meet Appendix B.
- e. The audit results were useful only in the sense that they pointed out areas where the current Quality Assurance Program can be improved to suit current (1977) requirements even though the work was essentially completed to earlier requirements.

APPENDIX "A"

AUDIT RESPONSE

CRITERION 1. ORGANIZATION

FINDING 1. A current organizational chart does exist.

Response: No comment. No Corrective Action required.

FINDING 2. Procedures KFP-1 and KFPS-1 do describe the quality organization, as well as some of the functional responsibility of the quality organization.

Response: No comment. No Corrective Action required.

FINDING 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.

Response: There is no evidence of deficient work as a result of the system described.

Welding procedures were originally prepared by the Welding Engineer at Williamsport, however, Mr. R. Fink, Q.A. Manager, later revised some of these and prepared some additional procedures. In all cases, procedures were reviewed and approved by PG&E Engineering and Construction.

Where Q.A. personnel were involved in procedure preparation, Engineering input was solicited and incorporated where applicable. Present policy requires Engineering to prepare and/or revise Engineering Procedures. Q.A. Department reviews and approves.

No further Corrective Action contemplated.

FINDING 4. Procedures KFP-4, KFPS-4, KFP-6, KFPS-5, KFP-8, KFPS-7, KFP-9, and KFPS-8 do describe some of the responsibilities of the Field Engineering Organization. The responsibilities of the other Field Construction Organizations are not described, nor are the full responsibilities of the Field Engineering Organization described.

Response: At the time our Quality Assurance Manual was written and implemented on this job, there were no requirements for position descriptions or responsibilities other than those of the Quality Assurance Department.

Corrective Action: Revise the Q.A. Manual Section KFP-1 to better define the Field organization and responsibilities outside of the Q.A. Department, and to clarify the responsibilities of the Q.A. Department.

FINDING 5. The descriptions of individual position responsibilities are inadequate. Some elements of position descriptions exist in the KFP and KFPS procedures, and job descriptions exist for inspection and inspection technician positions. No position descriptions exist for any of the upper-level site personnel.

Response: At the time our Q.A. Manual was written, it met the requirements of the Code and contract.

Corrective Action: Corrective Action for Item 4 above will cover this finding.

FINDING 6. The description and controls of the interfacial relationship between Pullman Power Products and Pacific Gas and Electric Company are inadequate. The contract and some Engineering Specifications do describe some interfaces and mechanisms. However, for the greatest scope of the work effort, there is little to describe how the interface will be managed and controlled. Some of the activities that require interface control are hydrostatic testing, nonconformance reporting, meetings, work on pipe rupture restraints, work on hangers, document control, reporting of deficiencies, responses to Pacific Gas and Electric Company audits, interfaces with other Pacific Gas and Electric Company contractors that impact Pullman Power Products work, etc.

Response: At the time of the contract, our Q.A. Manual addressed interfaces between our site departments, but only with PG&E insofar as design changes were concerned. Subsequently, many specifications have been written which do cover interfaces with PG&E in other areas. Interfacial activities are functioning properly, but are not necessarily documented in written form.

The following addresses each item in Finding 6 specifically:

- 6a) Hydrostatic Testing: PG&E has a procedure for preparation of the Procedure for each Hydrostatic Test. These test requirements are transmitted to Pullman Power Products Chief Engineer. When the requirements are received from PG&E, Pullman Power Products Chief Engineer or designee prepares the specific Hydro test procedure in accordance with ESD-229. This system complies with the job specifications and code requirements.
- 6b) Nonconformances are reported on a Discrepancy Report(DR) in accordance with Pullman Power Products Procedure ESD-240. DR's are transmitted to the PG&E's Resident Mechanical Engineer for disposition and/or approval. Following customer disposition the DR's are returned to Pullman Power Products' QA Department. The QA Department then issues approved DR's to personnel responsible for performing the work. Work is performed and documented

6b) in accordance with approved procedures. We fail
(Cont.) to understand why nonconformance reporting is considered inadequate by Audit Team.

6c) Meetings are held twice weekly between PG&E and Pullman Power Products to maintain an open communication line between the Utility and Contractor. In most cases, items discussed are merely up-dates of work in progress. If major changes are made, these are handled via drawing change, contract change or field orders. Official meeting minutes are not kept and distributed to attendees. Each attendee notes items of concern within his area of responsibility.

6d) Work on pipe rupture restraints and hangers are handled in the same manner as other work within the scope of Pullman Power Products contract. We disagree with this finding.

6e) Document Control: Drawings, specifications, and contracts and their revisions are transmitted to Pullman Power Products via PG&E Drawing Control Procedures. They are logged and distributed within Pullman Power Products in accordance with Pullman approved procedures.

6f) Reporting of deficiencies - see b - Nonconformances.

6g) Responses to PG&E's company audits: PG&E audit reports have been responded to in the same manner as any other audit report. Pullman Power Products has determined the cause for noted discrepancy, performed corrective action when required, established the necessary steps to prevent reoccurrence and responded to PG&E in writing indicating all actions taken. PG&E has further reviewed the implemented corrective action to determine that the steps taken were adequate and properly implemented. Copies of all audit reports are on file for review.

6h) Interfaces with other PG&E contractors are handled through the responsible PG&E resident engineer and in weekly contractors meetings. Contractors prepare and submit weekly schedules which are distributed among all active contractors.

Corrective
Action:

Review all current practices with PG&E site personnel to determine whether they satisfactorily define interfacial relationships. If not, modify existing or prepare new procedures as required.

FINDING 7.

The description and the controls of the interfacial relationship between Pullman Power Products Field Organization and the other Pullman Power Products organizations involved in the Diablo Canyon effort are inadequate. The Quality Assurance Manual does describe some quality interfaces between the Field and Corporate Offices. However, there are no requirements for periodic reporting from the Field Quality Assurance Organization to the Corporate Quality Assurance; there are no requirements for an upper-management review of corrective action reports, nonconformance reports, and personnel qualifications; the interface between the Field Organization and the Paramount shop is not described; the interface between the Resident Construction Manager and the Corporate Construction Manager is not described; the interface between Field Quality Assurance and Corporate Quality Assurance is not described with respect to field purchases and Corporate Quality Assurance auditing of these suppliers.

Response:

Although it is not documented in the site Q.A. Manual, a corporate policy was established to require corporate audits on a semi-annual basis. These cover requirements for review of corrective action, non-conformance and personnel qualification by upper management personnel. Corporate or management audits were conducted on a semi-annual basis starting September, 1972. There are records of nine (9) management audits on file indicating findings and recommended corrective action. In addition, the field site Quality Assurance Manager has been required since mid-1977 to forward a monthly report to the Director of Quality Assurance in Williamsport citing these items.

The Paramount Shop is considered as a supplier to PG&E and all interfaces must come through PG&E.

Interfaces between Field and Corporate Q.A. regarding purchasing is covered in the Q.A. Manual, Section KFP-6, Paragraph 6.3(g).

Corrective Action:

The Q.A. Manual Section KFP-18 will be revised to include current practices of management audits and reviews. No Corrective Action is required for the balance.

Interfaces between the Resident Construction Manager and Corporate Construction Manager will be covered in the corrective action for Item 4 above. Purchasing interface with Field and Corporate Q.A. will also be better defined.

FINDING 8.

The description and the controls of the interfacial relationship between the Pullman Power Products Field Quality Assurance Organization and the other Pullman Power Products Field Organizations are inadequate. The Quality Assurance

FINDING 8
(Cont.)

Manual and many of the Engineering Specifications describe interfaces and mechanisms. However, the interfaces relative to the construction and engineering efforts in regard to drawings approval; review of isometric, hangers, and restraint document packages; welders logs; and control of the welding process are not described.

Response: There are Engineering Specifications which describe the interfacial relationship for the items listed.

Corrective Action: As part of the review contemplated under Item 6 above, revisions will be made to procedures where necessary.

FINDING 9.

The stop work authority for the Field Quality Assurance Organization is not adequate. Procedure ESD-240 does describe the stop work authority for Hold Tags, but there are no mechanisms described or authority addressed for the circumstances when the Construction Organization elects to proceed through a Hold Tag stop.

Response: The Quality Assurance Manual as originally written did not specifically address the stop work authority of the Q.A. Department. It has been understood by all Pullman employees throughout the length of the job that the Quality Assurance Manager had the right to stop work at any time and that he had access to the President through the Director of Quality Assurance. It has never been necessary on this project for the site Q.A. Manager to exercise this prerogative.

Corrective Action: A stop work authority statement will appear in the revisions to Section KFP-1 of the Q.A. Manual as part of corrective action described for Item 4 above.

FINDING 10. The Field Quality Assurance Organization does report to a sufficiently high level of management.

Response: This finding tends to support the stop work authority response to Item 9 above.

No Corrective Action is required.

CRITERION II. PROGRAM

FINDING 1.

The contract between Pullman Power Products and Pacific Gas & Electric Company was signed in May, 1970, prior to the enforcement of 10 CFR 50, Appendix B. The contract did contain certain quality aspects that were requirements for the Pullman Power Products work effect. Work was not initiated on the Diablo Canyon site until late 1971, when Appendix B had become a requirement. [Appendix B was added to 10 CFR 50 on June 17, 1970, effective July 27, 1970 (35 FR 10498), and amended September 11, 1971, effective October 11, 1971 (36 FR 18301).] Even though the contract was not amended by Pacific Gas & Electric Company to include Appendix B as a requirement, Pullman Power Products was obligated to conform to Appendix B requirements; and the total quality program was evaluated against Appendix B and ANSI N45.2. While a written Quality Assurance Program exists, the program does not meet the requirements of 10 CFR 50, Appendix B or ANSI N45.2. The specific inadequacies of the program are described throughout the findings.

Response:

Our Quality Assurance Program as accepted by PG&E and implemented on the site meet the contractual requirements. It addresses Quality Assurance as required by ASME Section III Nuclear Vessel Code 1968 Edition. The manual was modified to suit specific added requirements of the State of California and was accepted by the ASME as a result of a field site survey.

As noted in the findings, Appendix B did not become effective until after the program was implemented in the field. Most of the ANSI 345 documents which gave specific direction for implementing Appendix "B" were not published until 1973 and 1974 when the bulk of the work was underway.

As the work progressed and experience dictated, we incorporated many provisions of the above documents in our Quality Assurance Manual, Engineering Specifications, and Quality Assurance Instructions. However, no attempt was made to address each specific requirement in one place.

The program in effect at any given time complied with the requirements of 10 CFR 50 Appendix B and implementing documents which existed at the time. All work was performed and documented to the program in effect. Therefore, the work is considered to have met the job requirements and was completed to the applicable quality level.

Numerous audits by PG&E, the NRC, the State, ASME, etc., have not found any fault with our program from this point of view.

Corrective Action:

Other than Corrective Actions noted throughout the response to the audit as a whole, no corrective action is anticipated.

FINDING 2. There is no description of the overall Quality Assurance Program. Special Quality Assurance instructions are not described, the relationship and purposes of the KFPS, KFP, and ESD procedures are not described; the Pipe Support Quality Assurance Manual is not described; and the relationship of the Pipe Support Quality Assurance Manual to the balance of the Quality Assurance Program is not documented.

Response: Our Quality Assurance Manual KFP-1 Paragraph 1.13 indicates that Engineering Specifications covering specific Quality Assurance functions would be prepared at site and approved by Company Q.A. and PG&E. These become part of the Q.A. Program. The term "Engineering Specifications" was intended to cover all program supplements without the need for specific identification as KFPS, KFP, or ESD's etc. The pipe support manual was added at a later date and served as an extension of the original manual.

No Corrective Action contemplated.

FINDING 3. Procedures KFP-1 and KFPS-1 do provide a broad and generalized description of the scope and applicability of the Quality Assurance Program. These procedures also reference the contract between Pullman Power Products and Pacific Gas & Electric Co. However, the total scope and applicability of the Quality Assurance Program are not adequately described. The efforts relative to pipe rupture restraints, receiving and control of materials and components other than Pullman Power Products procured, and the work associated with anchor bolts are not adequately described.

Response: Efforts relative to receiving and control of materials and components other than Pullman procured are very adequately covered in KFP-7, Paragraph 7.2.

Efforts relative to pipe rupture restraints and anchor bolts are covered by the Pipe Support Manual although not specifically listed.

Rupture restraints and anchor bolts are covered by numerous EDS's and Q.A. instructions. See ESD 243, 259, 260, 261, and Q.A. Instructions 72, 95, 96, 97, 105, etc.

No Corrective Action required.

FINDING 4. There is no evidence that upper management has performed scheduled reviews of non-conformance reports, personnel qualifications, and corrective actions.

Response: Corporate Management Audits have been performed on a regular basis since 1972. (See response to Criterion I, Finding 7.) Part of the auditing activity is to review non-conformance reports, personnel qualifications, and corrective action.

Since mid-1977, all site Q.A. Managers are required to submit a monthly report which includes a review of non-conformances, corrective actions, and personnel requirements.

No Corrective Action is required.

FINDING 5. There is evidence that upper management has performed reviews of audit reports generated by Pullman Power Products and Pacific Gas & Electric Co.

Response: This finding confirms existence of audit reports mentioned in 4 above.

No Corrective Action required.

FINDING 6. The indoctrination and training program requirements for personnel involved in inspection activities are adequate. Procedures KFP-2, KFP-3, KFPS-2, and KFPS-3 require training of NDE personnel; Procedure ESD-237 specifies a training program for the NDE personnel; Procedure ESD-237 also describes a training program for Quality Assurance Field Inspectors.

Response: No comment.

No Corrective Action required.

FINDING 7. The indoctrination and training program requirements for personnel involved in quality-related activities are inadequate. There is no requirement for indoctrination and training of welders, foremen, engineering personnel, warehousing personnel, etc.

Response: At the time our Q.A. Manual was originally issued, there were no requirements for training of quality related personnel outside of the Q.A. Department. We have conducted but not necessarily documented training sessions with Engineering personnel, General Foremen, welders, and other craft personnel. A full time welding engineer has provided instructions and directions to welders during original qualifications and during subsequent work. He has monitored their activities.

Corrective Action: Add a requirement in the Q.A. Manual, Section KFP-1 to cover a requirement that personnel in quality related functions are trained.

FINDING 8.

There is no evidence that personnel have been trained to assure their familiarity with the procedures they are responsible for implementing, except for welders, who have been trained and qualified to specific weld procedures.

Response:

Requirements for documented evidence of training was never addressed in our Q.A. Manual. We have conducted required training for NDE and inspection personnel to the requirements of our procedures (See Item 6 above), very often over and above contract requirements. Quality-related personnel were also trained (See Item 7 above). We have always performed this training on an informal basis but not necessarily documented it.

Corrective
Action:

All future training will be documented.

CRITERION III. DESIGN CONTROL

FINDING 1. There is no design manual for the preparation of isometrics and field fabrication drawings.

Response: Preparation of isometrics and field fabrication drawings do not involve any type of design. They are merely transfer of customer requirements from orthographic projections to more manageable documents to permit ease of installation and documentation of work performed. The Q.A. Manual covers requirements for control and approval by Q.A. Department of such drawings.

No Corrective Action required.

FINDING 2. Procedure KFPS-4 provides adequate control of the pipe support design effort.

Response: No Comment.

No Corrective Action required.

FINDING 3. Procedure KFP-4 requires that the Chief Field Engineer and the Field Quality Assurance/Quality Control Manager review field changes to Pacific Gas & Electric Company - approved drawings and specifications for ASME Code compliance. No written procedure for this review exists.

Response: In order to assure that Code requirements are correctly applied, our Q.A. Manager KFP-4 requires a review of PG&E initiated drawings and revisions by the Pullman Chief Field Engineer and Field Q.A. Manager. Both individuals were selected for this work because of experience and ability. They are well versed in applicable customer and Code requirements, and a written procedure for this review is not deemed necessary.

When drawing changes are requested by Pullman, a discrepancy report is written and submitted to PG&E for approval prior to any work.

No Corrective Action is necessary.

FINDING 4. A mechanism does exist for checking and reviewing Pullman Power Products drawings. However, this mechanism is not described in a written procedure. Documentation of the implementation of this informal procedure does exist.

Response: Our Q.A. Manual Section KFP-4 outlines requirements for review and checking of Pullman prepared documents. The finding indicates that implementation is acceptable. No formal procedure is deemed necessary.

No Corrective Action is contemplated.

FINDING 5. The isometrics and field fabrication drawings do indicate the classification of systems.

Response: No comment.

No Corrective Action required.

FINDING 6. Procedure ESD-205 does contain a classification of systems and the requirements for each classification.

Response: No comment.

No Corrective Action required.

FINDING 7. The changes to isometric drawings and field fabrication drawings are indicated on the documents, as well as the reason for the change. Procedure KFP-9 establishes a mechanism to permit tracking of all revisions, i.e., the Chief Field Engineer is required to maintain a copy of all voided drawings.

Response: No comment.

No Corrective Action required.

FINDING 8. Procedure KFPS-8 requires the Chief Field Support Engineer to assure that all supports are fabricated to the latest drawing revision. No mechanism exists to comply with this requirement.

Response: Pipe supports are part of the total piping system. Q.A. Manual KFP.4 Paragraph 4.3.7 requires the Chief Engineer to assure that all systems are built to latest drawing revision prior to test. ESD-253 covers pipe support drawing control in detail. ESD 239 requires release from support engineering before closeout.

No Corrective Action required.

CRITERION IV. PROCUREMENT DOCUMENT CONTROL

FINDING 1. Procedures KFP-6 and KFPS-5 adequately describe the responsibilities associated with field purchase order processing.

Response: No comment.

No Corrective Action required.

FINDING 2. Procedure ESD-226 adequately describes the quality requirements for purchase specifications of the usual Pullman Power Products scope of purchased materials.

Response: No comment.

No Corrective Action required.

FINDING 3. Procedures KFP-6 and KFPS-5 do not require that the purchase order state that Pullman Power Products is given the right to audit the subcontractor shop.

Response: All vendors or subcontractors are placed on the Approved Vendor List as a result of successful surveys and yearly audits by the Q.A. Department, Williamsport. Field purchases must be made from the Approved Vendor List issued by Corporate Headquarters.

No Corrective Action required.

FINDING 4. No written procedure permits verification of the selected supplier as one identified on the Pullman Power Products corporate-approved vendors list.

Response: Q.A. Manual Section KFP-6, Paragraph 6.3.6 requires that the Q.A. Manager review all requisitions to verify that the supplier is on the Approved Vendors List. A separate procedure is superfluous.

No Corrective Action required.

FINDING 5. There is no mechanism by which Pullman Power Products Corporate is informed of the procurement of safety-related parts, components, equipment, and material to assure that the selected supplier is placed on the Corporate audit schedule.

Response: As noted in 3 and 4 above, suppliers must appear on the Approved Vendor list prepared at Corporate Headquarters. All suppliers are audited on a yearly basis.

Copies of all Field Purchase Orders are sent to the Construction Engineer in Williamsport.

No Corrective Action required.

CRITERION V. INSTRUCTIONS, PROCEDURES, AND DRAWINGS

FINDING 1. There is no requirement that activities affecting quality shall be prescribed by documented instructions, procedures, and drawings.

Response: We disagree with this finding. The Q.A. Manuals in Sections KFP-1, Paragraph 1.13, KFP-8, and KFPS-1 all specifically require that activities affecting quality be identified on the field process sheets by specific reference to the special process procedure by number. Welding procedures by number, NDE procedures by number, etc. Specific ESD's listed give the detailed instructions.

No Corrective Action is required.

FINDING 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.

Response: Hanger package review is covered by KFPS-12. ESD-253 describes hanger drawing control. A detailed check list for hanger review needs to be developed.

Preheating for welding is covered in the Weld Procedure Specification. ESD-218 also describes preheat requirements. Preheat temperature range is also listed on the process sheet. When specified, it was performed and documented on the appropriate process sheet.

Note-O-Grams, Rejection Notices, and Inspector Logs are internal working tools of the Q.A. Department primarily for status reporting and record. They are intended to make the system more fool-proof by reducing verbal communication to a minimum. Special procedures for these appear to be superfluous..

Corrective Action: Revise ESD-254 to include hanger and restraint check list.

FINDING 3. Many activities affecting quality are insufficiently described in procedures. Among those activities are: isometric package review, post-welding heat treatment, nonconformance reporting, Ninety-Day Welders' Log and Weekly Qualified-Welders List, and auditing.

Response:

Isometric package review requirements are described in ESD-254.

Post weld heat treatment is covered by ESD-218 and weld procedures.

Non-conformance reporting is adequately covering in ESD-240.

Ninety-Day Welders' Log and Weekly Qualified Welder Lists are covered in the Q.A. Manual System KFP-15 and in ESD-216.

Auditing is covered by our Q.A. Manual KFP-18. Corporate audits are conducted by selected, qualified personnel from Williamsport Headquarters under a qualified lead auditor. A copy of the Corporate Audit Procedure XVIII-1 is available from the site Q.A. Manager.

In the past, there have been 16 NRC audits, 2 ASME audits, 9 management audits, 1 independent audit and 40 PG&E audits of Pullman for a total of 68, performed at this site to verify performance to applicable requirements.

No Corrective Action is required for any of the above items.

FINDING 4.

The present procedures are generally inadequate for providing direction to those performing the work. The procedures do not follow the flow of the work; many procedures are very long (over 10 pages); insufficient information is given; important information is not provided or referenced in the procedure.

Response:

This is a very general statement which is impossible to track due to lack of specificity.

All procedures now in effect, have been reviewed and approved by PG&E.

Corrective
Action:

A review of all procedures will take place under Corrective Action for Criterion I, Finding 6.

CRITERION VI. DOCUMENT CONTROL

FINDING 1. Procedures KFP-9 and KFPS-8 are adequate for field drawing control, and Procedure ESD-253 is adequate for pipe-support drawing control.

Response: No comment.

No Corrective Action required.

FINDING 2. Procedures KFP-17 and KFPS-15 are adequate for control of the KFP and KFPS procedures and are appropriately implemented.

Response: No comment.

No Corrective Action required.

FINDING 3. There is no procedure for control of ESD procedures.

Response: ESD's have been controlled in the same manner as the Q.A. Manual. Their control is not specifically governed by written procedures.

Corrective Action: Revise Q.A. Manual KFP-17 to include control of ESD procedures.

FINDING 4. There is no procedure for control of Special Quality Assurance Instructions.

Response: Special Quality Assurance Instructions are used for clarification of ESD's.

Corrective Action: Corrective action of Item 3 above will include definition and control of Special Q.A. Instructions.

FINDING 5. The Pullman Power Products review of completed packages relative to hangers and pipe restraints is not detailed in a procedure, nor is ESD-254 complete as to what is actually done for the isometric package. Procedure ESD-254 does describe some aspects of "Piping System Documentation Review".

Response: ESD-254 is intended to cover the entire piping system which incorporates hangers and restraints and the system is working effectively. Specific hanger information is not covered on the checklists.

Corrective Action: Revise ESD-254 to include hanger and restraint check list.

FINDING 6.

The Pullman Power Products log, Drawing Control Index (KFP-9 and KFPS-8), is maintained in a nonpermanent manner. The log is filled out in pencil; and when the number of revisions exceeds the available space, the early revisions are erased to accommodate the new revision.

Response:

The purpose of the Drawing Control Index is to assure that all site departments are working with the latest drawings. Once a drawing has become obsolete, the record of when it was received has no meaning. Accordingly, we have not concerned ourselves with maintaining a record of obsolete drawings.

No Corrective Action anticipated.

FINDING 7.

No mechanism assures that the Pacific Gas & Electric Co. drawings being used as the reference drawings are the latest issued revision. Audits are frequently performed to determine that Pullman Power Products has the latest Pacific Gas & Electric Co. drawings. However, the audit mechanism is not satisfactory when it is the only mechanism.

Response:

It is PG&E's obligation to assure that we receive the latest drawings. As they are received, they are logged in the Drawing Control Index as outlined in KFP-9. PG&E personal regularly audit this document. Since August, 1977, PG&E has been forwarding, on a monthly basis, a list of latest drawings.

No Corrective Action required.

FINDING 8.

There is no Weld Rod Requisition for one of the welders who participated in FW-345 of isometric 04-500-139.

Response:

FW-345 was welded by several welders including welder "LB". Rod requisitions are available for all but "LB".

Records indicate that "LB" welded on FW-345 and FW-346 on the same day. There is a requisition for rods on FW-346 for Welder "LB". Rod withdrawn for FW-346 is the same type and heat number as that withdrawn by others for FW-345.

FW-345 and FW-346 are both welded in accordance with the same procedure.

ESD-215 requires the field inspector to verify that proper weld rod was used. He was not necessarily required to verify requisition as it related to the specific weld number.

Since this incident, all requisitions are reviewed by the welding inspector for weld number, welding procedure, electrode, and welder symbol.

No Corrective Action is required.

FINDING 9. There is evidence that documents have been backdated and changed to meet requirements without any substantiation of the information.

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

Response:

- (a) For Isometric 2-14-47: The weld was completed but not examined by PT until 19 months later. It was then accepted.
- (b) For Isometric 2-14-8: FW-1673 did not show on Revision 2 of the isometric. During the installation to the required Process Sheet, it was determined that an additional weld (FW-1673) was required. In the earlier days, Field Engineers, in conjunction with the Field Q.A. Inspectors, were permitted to initiate field process sheet revisions with the required information. The Engineers revised the process sheet and marked the working drawing with Field Q.A. Inspector approval. This information was transmitted to the office where the original isometric was revised. The Process Sheet and all required documentation for FW-1673 are in the Isometric Record Package.

Response: (b) Present procedures require that the need for added welds be reported to the office where the original drawing is revised before a new process sheet is prepared.

- (c) For Isometric 2-14-53: During an in-house audit, the Pullman auditor noted that a visual inspection point for FW-247 was not initialed by the Field Q.A. Inspector. The inspector verified from his daily work log that he had completed the required inspection. He accordingly signed and dated the sheet as of the inspection date.

Records indicate that the requisition change was initiated by a Q.A. Inspector.

Current procedures require initials and date.

- (d) For FW-2-14-59: Records indicate that this was a Code Class 3 weld made with a backing ring. No dxms were used. The standard process sheet form requires verification of dam removal. Field Q.A. Inspector should have indicated "Not Applicable" rather than signing this point.
- (e) For FW-2-26-417: Field weld numbers FW-144-145-196 and 197 are 3/4" socket welds. The required fillet is approximately 1/4". Fourteen (14) rods are sufficient.

Field Process Sheets have provisions for more than one weld on a sheet although separate entries are required for each weld. Process sheets show that all welds were completed on the same day.

Procedures permit a single requisition for not more than four (4) socket welds at a time. The field Q.A. Inspector noted that sufficient rods were available to permit completion of FW-197 and added this number to the requisition. This precluded necessity of the welder returning unused rods and obtaining a new requisition and rod for one 3/4" socket weld solely for record.

No Corrective Action required for any of the above.

FINDING 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.

Response: A Pullman audit of December, 1975 pointed out the subject of changer without dating. The requirement for initials and date appear in ESD-254 on a check list.

Corrective
Action:

Revise ESD-254 to specifically detail the need for initials and dates on record changes made by Q.A. personnel.

FINDING 11.

Procedures KFP-14, KFPS-12, ESD-239, and ESD-254 are adequate instructions to assure that the correct documentation has been assembled and the system is ready for turnover.

Response:

This statement seems to negate part of the statement on Item 5 regarding isometric packages.

No Corrective Action required.

CRITERION VII. CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

FINDING 1. The interface between the Pullman Power Products Field Organization and the Pullman Power Products Corporate Organization relative to selection and monitoring of suppliers' fulfilling field purchase requisitions is inadequate.

Response:

This finding does not cite any specific supplier or purchase order which was found inadequate. This conclusion is not justified by the evidence. Pullman Power Products corporate organization through the Quality Assurance Department in Williamsport maintains the updated Approved Vendor List which is used throughout the Pullman Power Products organization (including Diablo Canyon) for use in procurement of materials from qualified suppliers. All suppliers are accepted on the basis of appropriate ASME Certificates or a Pullman survey. Vendors are audited annually. (See also Criterion IV Items 4 and 5).

All field purchased material is subject to field receiving inspection as outlined in KFP-7.

No Corrective Action is required.

FINDING 2. Procedures KFP-7, KFPS-6, ESD-217, ESD-226, and ESD-261 are adequate for the performance of receiving inspection.

Response:

No comment.

No Corrective Action required.

CRITERION VIII. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

FINDING 1. Identification and control of piping and valves are adequately specified by Procedures ESD-200 and ESD-201.

Response: No comment.

No Corrective Action required.

FINDING 2. Identification and control of weld material are adequately specified by Procedures KFP-12, KFPS-11, and ESD-202.

Response: No comment.

No Corrective Action required.

FINDING 3. Identification and control of backing gas dams are adequately specified by Procedure ESD-214.

Response: No comment.

No Corrective Action required.

FINDING 4. Procedures KFP-8 and KFPS-7 are adequate for specifying that the identification of parts and components is to be recorded on the Field Process Sheet. The implementation of this procedure is adequate.

Response: No comment.

No Corrective Action required.

FINDING 5. The isometric drawings and field fabrication drawings are the major documents for recording the identification of the parts, spools, and components. While there is no procedural requirement, this mechanism has been followed and is an excellent technique.

Response: No comment.

No Corrective Action required.

FINDING 6. Identification of welds and welders is adequately described in Procedures ESD-203, 204, 221, and 243.

Response: No comment.

No Corrective Action required.

FINDING 7. Proper methods of marking are specified in Procedures ESD-200, 201, 202, 203, 204, 221, 223, and 243.

Response: No comment.

No Corrective Action required.

FINDING 8. Material control techniques for temporary pipe attachments are adequately described in Procedure ESD-232.

Response: No comment.

No Corrective Action required.

FINDING 9. Procedure ESD-248 adequately describes controls for the repair of installed valves and for valve parts control.

Response: No comment.

No Corrective Action required.

FINDING 10. Adequate control of snubbers, plate, and other components is achieved by using Procedures ESD-200, ESD-201, KFP-8, KFPS-7, and the practices associated with field drawing preparation. However, no procedures specifically address these items.

Response: Snubbers, plates, and other components are covered in ESD-223, 243, 261.

No Corrective Action required.

FINDING 11. Procedure KFP-20 provides an adequate mechanism to control nuts, bolts, etc.

Response: No comment.

No Corrective Action required.

FINDING 12. Procedure ESD-223 does not give adequate instructions for the identification and control of Class I Pipe Supports.

Response: We disagree. ESD-223 is adequate.

No Corrective Action required.

FINDING 13. Procedure ESD-228 does provide adequate guidance for the marking of tools used in grinding stainless steel and carbon steel welds.

Response: No comment.

No Corrective Action required.

CRITERION IX. SPECIAL PROCESSES

FINDING 1. Nondestructive examination has been properly specified as a special process. Procedures KFP-3, KFPS-3, ESD-235, and ESD-256 adequately specify requirements for NDE personnel.

Response: No comment.

No Corrective Action required.

FINDING 2. The requirements for Field Quality Assurance Inspectors are adequately specified in Procedures ESD-237 and ESD-256.

Response: No comment.

No Corrective Action required.

FINDING 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. G. 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.

Response: The finding fails to differentiate between NDE personnel and inspection personnel.

A review of the files (certificates and examinations) indicates that all NDE personnel had completed the examinations specified by ASNT-TC-1A as required by our original Q.A. Manual, before they were allowed to perform any work. They were trained under the General Dynamics program but documented evidence in terms of subject matter and hours spent is not available.

A review of the files indicate that all NDE personnel either had required experience and background to permit immediate qualification to Level II, or that they took an examination, worked the prescribed time as Level I and subsequently, passed a Level II examination before being allowed to work as Level II.

Response:
(Cont.)

Records indicate that some NDE examinations were graded but not signed by the Q.A. Manager. There are no requirements for this. The Q.A. Manager did sign the Certificates and identification cards as evidence that satisfactory test results were attained for the Level examined.

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.

No Corrective Action is required.

FINDING 4.

NDE procedure qualification is adequately described in Procedures KFP-2 and KFPS-2 as being the responsibility of the Manager of Quality Assurance, Williamsport Headquarters.

Response:

No comment.

No Corrective Action required.

FINDING 5.

Welding has been properly specified as a special process.

Response:

No comment.

No Corrective Action required.

FINDING 6.

Welding procedure qualifications are adequately described in Procedure KFP-15 as being the responsibility of the Welding Engineer (Williamsport).

Response:

No comment.

No Corrective Action required.

FINDING 7.

Procedures KFP-15, KFPS-13, and ESD-216 are adequate for specifying welder qualifications.

Response:

No comment.

No Corrective Action required.

FINDING 8. The certification of the following welders, by weld symbol, was examined and found acceptable: U, AN, IH, PO, VD, QZ, HY, PD, JL, ET, HL, AY, MO, TQ, IQ, PG, KP, XC, FC, and ZC.

Response: No comment.

No Corrective Action required.

FINDING 9. The certification of welder U was not signed.

Response: The qualification records indicate that welder "U" was successfully qualified. The welding engineer failed to sign the certification at the time.

Corrective Action: Field Q.A. Manager has reviewed the qualification record and will attest in writing on the certificate that welder "U" records indicate he was properly qualified.

FINDING 10. A number of procedures provide mechanisms for control of the welding process: ESD-203, 204, 215, 219, 221, 225, 242, and 243. However, the control of the welding process has been inadequate as follows:

10a) Records of welder qualification prior to 1972 are not available.

Response: The first job weld was done on December 28, 1971. A record of the welders qualification for this first weld is dated December, 1971. No other welding in 1971.

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.

Response: There is a void in the 90 day weld log from August, 1972 to December, 1972.

By reviewing welding records, a qualification status for this period has been reconstructed. All welders were found to be within the 90-day requalification period. Records are available for review.

No further Corrective Action is required.

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.

10c) Cont.
Response:

The 90 day Welder Status Log was modified and improved on several occasions. It is intended to assure the welder remains qualified by process. The Code requires requalification in the event the welder did not use a process within 90 days. Specific welding procedures or specific thickness range of qualification are not part of this form. They appear on each qualification certificate.

No Corrective Action is required.

- 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.

Response: The Q.A. Manual Section KFP-15 Paragraph 15.2.c indicates that the qualification status of each welder is kept on the 90 day Welders Status Log. The Inspection Supervisor prepares the Weekly Qualified Status List from the 90 day log and distributes it to the foreman and Welding Q.A. Inspectors.

No Corrective Action required.

- 10e) No procedure specifies who is responsible for the Ninety-Day Welders' Log, the Weekly Qualified-Welders List, or the Welder's Qualification Card; how the information is obtained; how the logs are used; to whom they are distributed; etc.

Response: Q.A. Manual Section KFP-15, Paragraph 15.2 states that a field Q.A. Inspector appointed by the Q.A. Manager is responsible for welder qualification. This would include collection of qualification results, use of logs, and distribution of logs.

Corrective Action: Requirements for qualification results, use of logs, and distribution will be added to ESD-216.

- 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.

Response: KFPS-13 did not incorporate the option to permit extension of welder qualification to 6 months when employed on other welding processes. This is not a deviation, but merely an omission. KFPS-13 has been revised accordingly.

No Corrective Action is required.

10g) 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.

Response: 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 Rev. 1 & DR-2539, Rev. 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 2/18/74.

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 2½" pipe size. Prior qualification by DR-2538 Rev. 1 and DR-2539 Rev. 1 covers qualification of these seams. No further NDE required. PG&E accepted seams on this basis.

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.

Response: ESD-219 requires random sampling of in-process welding. There is no requirement for recording on the process sheet. Each welder is audited to a specific weld procedure on a production weld at least once every six weeks per ESD-219. The completed check sheet serves to verify this in-process check. There is evidence of sampling of in-process welding indicated either on process sheets or recorded in Inspectors Daily Logs.

Corrective Action: Revise ESD-219 to permit recording of random sampling checks, either on the process sheet, Inspectors Daily Log, or Weld Check List.

- 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.

Response:

ESD-219 was originally written in February, 1973. It was revised in September, 1973 to initiate auditing of welders. Audit reports were begun in November, 1973. All welds, including those performed prior to audits had fit-up, in-process, final inspections and required NDE to verify acceptability.

No Corrective Action required.

- 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.

Response:

From the outset of the project, all stainless steel filler material was purchased with a 5 to 15% ferrite requirement. ESD-219 was issued February, 1973 to respond to the intent of Safety Guide 1.31 issued August, 1972. Severin gauges were on site in early 1973 to implement monitoring of completed welds.

A sampling of completed welds made prior to receipt of Severin gauges were checked subsequent to receipt of gauges. These indicate acceptable ferrite per Safety Guide 1.31. Welds made after receipt of gauges were all in compliance with ESD-219.

No Corrective Action required.

- 10k) Hangers are not welded in accordance with Pacific Gas & Electric Company requirements. 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.

Response:

Pullman Inspection personnel have reviewed Hangers No. 2023-IV and 2039-2V and found that they were welded in accordance with customer drawings. This was pointed out to NSC at the exit interview. Pullman asked that they reinspect, but NSC declined.

No other hanger discrepancies were reported.

No Corrective Action required.

- 10l) 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

101) repaired and subjected to more than one stress relief is
Cont. indeterminate because of the time at temperature limitations
within the qualified weld procedure.

Response: Review of contract reveals that impact testing of welding
procedure qualifications was not required. Requirements
for impact testing of procedure qualifications when required
by customer specifications does not appear in B31.7 until
1972. Present procedures are acceptable.

No Corrective Action required.

10m) Some welders do not receive sufficient training. Welders,
fabricating the pipe rupture restraints within the contain-
ment, 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.

Response: Welders receive written instructions when qualified. These
include rod requisitions, use of WPS, notification of
Q.A. prior to welding, etc. All welders are qualified on
pipe in required positions. The auditors seem to feel there
is a difference in welding pipe and plate. There is, plate
is easier. Note that ASME Section IX Paragraph QW303
indicates that for 1G and 2G positions, qualification may be
made on pipe or plate interchangeably. In the 5G and 6G
positions qualification on pipe qualifies on plate but not
vice-versa. We feel no added training is required.

No Corrective Action required.

10n) There is no procedure for the preheating of weld joints.

Response: Requirements for preheat temperature are given in each
Welding Procedure Specification and shown on the Process
Sheet.

For pressure retaining materials, ESD-218 outlines the
provisions for installing resistance coils, blankets,
thermocouples for post weld heat treatment. These
requirements apply equally for preheat, since preheat, weld
and post heat are carried on as one continuous process.

Corrective
Action: Reference to preheat will be added to title with specific
requirements in Paragraph 5.2 of ESD-218.

10o) The initial results of the welding auditing (from November
5, 1973 to February, 1974) indicate that the following
problems existed:

- 100) (1) The welders did not understand shielding
Cont. 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 or
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.

Response:

The following is a response to each individual finding:

- (1) Welders do understand shielding and purging.
During welder audits, it was found on few
occasions that the welders were not operating
within the criteria established. Findings
indicated that welders were using higher
flow rates than was permitted by the
procedure. This is a non-essential variable
of the ASME Section IX Code. If there were
problems associated with excessive flow rate,
the resulting indications would have been
porosity. This did not occur since welds
were subsequently found acceptable by visual
and nondestructive examination.
- (2) 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.

- (3) Review of weld audit sheets revealed a small number of welders welding outside the prescribed procedure amperage range. Amperage is a nonessential variable and visual inspection and NDE examination indicates welds were acceptable.
- (4) Weld procedures are available. Each foreman, general foreman, and QA inspector has copies of procedures. The welders are issued a synopsis of weld procedures giving voltage and amperage range, and rod type and size for each procedure. Review of audit report indicates a small number of this type procedure deviation occurred.
- (5) The inavailability of an oxygen analyzer at time of internal audit does not indicate that the weld was not purged. Acceptable NDE is an indication that purge was satisfactory. There appears to be no basis for the statement that the Time vs. Flowrate techniques were not implemented.
- (6) The weld rod control procedure permits the exposure of weld rod without the use of an oven up to four (4) hours. In those cases where we noted oven temperatures to be less than that required by the procedures, we also noted that rod had been issued for less than 4 hours. It was determined that weld quality was not adversely effected. The welders were required to have ovens repaired or replaced in each case.
- (7) Welders were tested and met the Qualification Requirements of ASME Section IX. They were issued written instructions indicating the requirements for securing weld rod, inter-pass temperature control, proper voltage/amperage range settings. Their supervisor has also issued instructions to the welders on a daily basis as deemed necessary.

All the findings recorded above were derived from Pullman Field Audit per ESD-219. In each case, Corrective Action was immediately taken. If it was determined by the Pullman Welding Auditor that the finding would result in defective welding, further action in the form of discrepancy report would have been initiated. The items listed are ASME Section IX Non-Essential Variables and do not necessarily infer defective welding. All welds were subjected to fit-up, and final visual inspection and NDE and found to be acceptable.

FINDING 11.

Welding procedures for carbon steel welding require pre-heat and interpass temperatures for material that has a carbon content in excess of 0.30 percent and a thickness of one inch or more. There is no mechanism by which the welder can determine carbon content.

Response:

It is not the welder's prerogative to determine the carbon content of any particular material. This is a requirement of the Engineering Department and the process sheet writer will indicate the required preheat and interpass temperature as a result of his review of the minimum specified carbon content of the materials being joined. The welder need only follow the requirements of the process sheet.

No Corrective Action is required.

FINDING 12.

Procedure ESD-221 does provide adequate guidance on weld repairs.

Response:

No comment.

No Corrective Action required.

FINDING 13.

Heat treating has been identified as a special process in the Pacific Gas & Electric Company contract (as well as in Appendix B), but it has not been controlled as a special process by Pullman Power Products.

Response:

Finding 14 below indicates that KFP-13 and ESD-218 do provide adequate controls for proper post weld heat treatment. We can only assume that the finding points out that we do not identify heat treatment as a special process in our Q.A. Manual. Heat treatment has been controlled as a special process, including operator training and evidence of satisfactory performance is on file.

No Corrective Action required.

FINDING 14.

Procedures KFP-13 and ESD-218 do provide controls of the post weld heat treatment process. The implementation of Procedure ESD-218 is acceptable.

Response:

See Item 13 above.

No Corrective Action required.

FINDING 15.

Cleaning has not been identified as a special process.

Response:

Cleaning is not identified in 10 CFR 50 Appendix "B" as a special process.

Cleaning of components prior to installation and cleaning of surfaces to assure freedom from halogens are performed by Pullman to various ESD's. See Item 16 below.

Response:
(Cont.)

Cleaning of the system prior to startup is performed by PG&E Co.

No Corrective Action required.

FINDING 16.

Procedures ESD-220, 224, 238, 242, 252, 258, 259, and 261 provide adequate guidance in cleaning and cleanliness of the various materials, parts, and components.

Response:

See Item 15 above.

No Corrective Action required.

FINDING 17.

Procedure ESD-231 provides some guidance on hot and cold bending of small bore piping. The guidance is considered insufficient to assure that the bending is done properly to avoid high stresses and thinning of the wall.

Response:

All piping field bent is 2 inch and smaller. All stainless steel was cold bent. That inside the containment was solution heat treated, pickled, and passivated to eliminate any stress corrosion problem. That outside the containment was installed as bent. All of this conforms to PG&E specifications.

Corrective Action:

A sampling of bends has been measured for thickness by U.T. (34 on Unit 1, 27 on Unit 2 or about 25% of the bends). Results indicate all are above the required minimum wall. ESD-231 has been revised to require UT thickness check on future bends.

FINDING 18.

Procedure ESD-238 provides adequate instruction in torquing of bolting for pipe flanges.

Response:

No comment.

No Corrective Action required.

FINDING 19.

Procedure ESD-259 provides adequate instruction for installing Grinnel Snubbers.

Response:

No comment.

No Corrective Action is required.

FINDING 20.

Procedure ESD-224 provides excellent instruction for assembly and torquing of installed valves.

Response:

No comment.

No Corrective Action is required.

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CRITERION X. INSPECTION

FINDING 1. Procedures KFP-5, 8, and 14 thoroughly describe the interface between Pullman Power Products and the . . Authorized Inspector.

Response: No comment.

No Corrective Action required.

FINDING 2. Procedures KFP-8 and KFPS-7 provide the requirements for the Field Process Sheet, which specifies inspection points and inspector sign-off.

Response: No comment.

No Corrective Action required.

FINDING 3. The Field Process Sheet references procedures to which the work and the inspections will be performed.

Response: No comment.

No Corrective Action required.

FINDING 4. The inspection procedures are detailed in Procedures ESD-206, 207, 208, 209, 210, 211, 215, 219, 225, 233, 234, 236, 241, 243, 244, 249, 250, 251, 255, 249, and 260. These procedures are, in general, broad descriptions of the inspection process for the total range of the work scope and are adequate for that purpose.

Response: No comment.

No Corrective Action required.

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).

Response: The process sheet indicates each point where an inspection or examination is required and references the appropriate procedure number. Each procedure defines the inspection requirements, equipment, and accept-reject criteria.

No Corrective Action required.

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.

Response:

An acceptance signature indicates that the requirements of the referenced procedure were met. We have had audits by ASME, by the NRC, PG&E, by Hartford Steam Boiler, and the State of California, and our own independent auditing companies, as well as Pullman Power Products. Had the inspection process not been acceptable or auditable, these other agencies would have brought this to our attention long ago.

No Corrective Action required.

FINDING 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.

Response:

Records indicate that FW-110 was penetrant examined. FW-111 was mag particle examined, and a repair was subsequently penetrant examined. FW-112 was mag particle examined.

When these items were called to our attention, paint was removed from the welds and all welds were visually inspected and penetrant examined. FW-110, FW-112, and the repaired area of FW-111 were effectively examined. FW-111 (originally M.T.) had some interbead crevices which contained residual paint. The paint produced several broad indications which were not considered relevant. Visual examinations indicated FW-111 could be effectively mag particle examined.

Welds cited appear to be the worst cases from the group reviewed.

No further Corrective Action is required.

FINDING 8.

For FW-110 (isometric package 2-14-31), the Process Sheet indicates that MT was performed; however, the inspection sheet for PT shows that weld number, and the inspection sheet for MT does not show that weld number.

Response:

PT or MT are equally acceptable methods for inspecting this weld.

Process Sheet called for MT. Recording indicates PT. Inspector signed Inspection Point without having Process Sheet revised to indicate PT.

Corrective
Action:

A review of all Process Sheets was made to verify that actual process used is on the Process Sheet. DR was issued to cover those items found in error.

No further Corrective Action needed.

FINDING 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.

Response:

FW-83 was repaired. R1 symbol was inadvertently omitted from radiograph (R1 was inked on) and weld surface.

Alleged surface defect was inspected independently by two Level III personnel and found to be acceptable.

Corrective
Action:

R1 symbol has been added to weld.

FINDING 10.

Isometric package 1-03-1 has a step that requires a Pullman Power Products inspector sign-off. This requirement was removed, and the step was accepted by a Pacific Gas & Electric Company employee.

Response:

The inspection in question was a clean and fit-up operation. It was Code Class "C". There is no requirement that this operation be witnessed and signed off. This is an isolated problem which occurred in 1972. This procedure has not been permitted since that time.

No further Corrective Action required.

CRITERION XI. TEST CONTROL

FINDING 1. Procedure ESD-229 adequately defines the methods and inspections relative to performing hydrostatic tests.

Response: No comment.

No Corrective Action required.

FINDING 2. There is no description of the responsibilities of Pacific Gas & Electric Company or of the Pullman Power Products/Pacific Gas & Electric Company interface to hydrostatic testing.

Response: A complete description of the extent of each hydrottest is prepared by PG&E and given to Pullman. Pullman personnel performs the test under guidance of PG&E employees and to their specific requirements. All records are complete and acceptable. Clarification of interfacial relationships will be covered in response to Criterion I, Finding 6.

FINDING 3. Procedure ESD-229 is not adequate for describing the flow and authorities relative to the individual hydrostatic test procedures to be performed.

Response: ESD-229 is a general procedure for conducting pressure tests. Specific test limits, requirements, authority, are all furnished by PG&E in a written procedure for each test. See response for Finding 2 above.

No Corrective Action required.

FINDING 4. Hydrostatic test packages 7-2, 7-2A, 8-12, 9-12, 106, 106A, 106B, and 64 were examined and found acceptable.

Response: No comment.

No Corrective Action required.

FINDING 5. The B31.1 and B31.7 Codes require 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

FINDING 5
(Cont.)

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.

Response:

Pullman is hydrostatically testing Class A & B piping to the Code.

There is a letter on file from PG&E which relieves Pullman of responsibility for Code compliance on Class C (B31.7 Class III) relative to hydrotest. In some cases, testing is performed at less than Code requirements because of limiting components. B31.7 paragraph 737.4 permits an upper limit of hydrostatic test to be established by the designer if the required 1.25 design pressure exceeds component limits. Balance of systems are given an initial service leak test as permitted by Code. None of the Class "C" systems are Code stamped if hydrotest is not per Code.

There is no Class "D" piping.

Class "E" and Class "E Special" are B31.1 Systems. Most are tested per Code, some at less than Code because of limiting components and others are given initial service leak tests as permitted by the Code.

In our opinion, the owner, PG&E is ultimately responsible to the NRC for the suitability of the system. In following their instructions, we are fulfilling our contractual obligations.

No Corrective Action is required.

CRITERION XII. MEASURING AND TEST EQUIPMENT

FINDING 1.

Procedures KFP-11, KFPS-10, and ESD-213 describe an adequate calibration program.

Response:

No comment.

No Corrective Action required.

FINDING 2.

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.

Response:

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

Code requires heat treatment in the range of 1100-1200 which is fairly wide. In addition, each weld joint has more than one thermocouple. Any thermocouple with significant deviation would show as widely divergent from the others on the charts.

No Corrective Action required.

FINDING 3.

The calibration program has not been adequately implemented.

3a)

Paragraph 11.5 of Procedure KFP-11 and Paragraph 10.5 of Procedure KFPS-10 require reinspection of materials and components if the measuring and test equipment is found to be out-of-calibration. Except for hydrostatic testing and heat treating, the identity of measuring and test equipment is not related to the inspections performed.

Response:

The system now in effect requires recording of the instrument serial number used on each inspection, thus permitting reinspection of work if instrument is found to be out of calibration.

As noted, Hydrotest gages and Heat Treatment Recorders were found to be satisfactory.

Response:
(Cont.)

Torque wrenches were used for the most part on rupture restraints to AISC requirements which required daily calibration of each wrench prior to use. Accordingly, the wrenches were calibrated but the serial number of the wrench used was not recorded. Some bolted pressure joints were torqued with calibrated wrenches, but serial numbers were not recorded. Any leakage would have been detected in hydrotest.

PG&E has reviewed previous records and finds no out-of-tolerance condition which would result in over-stress of bolting.

Tong Testers are used only to monitor welding amperage which is a non-essential variable in welding. Due to the wide range of amperage permitted, a deviation on the Tong Tester would not be detrimental.

Corrective
Action:

The procedures have been revised to require recording of instrument serial number on inspection or audit sheets.

A 100% review of all torque records were made to assure that correct torque was applied.

A program of random verification of torque loads is underway.

3b)

Procedure ESD-213 does not contain a mechanism to report out-of-calibration measuring and test equipment to Pullman Power Products. Some forms used by the calibration subcontractors only contain provisions for attesting to calibrating the equipment to appropriate standards and have no provisions for recording the actual values obtained.

Response:

The only items for which calibration is subcontracted are tong testers and potentiometers.

For tong testers, see response in prior finding.

Unless a potentiometer were badly out of calibration, the very wide range of heat treatment temperature permitted by the Code would not be violated. A badly out-of-range potentiometer would have been called to our attention by the subcontractor.

Corrective
Action:

Procedures now require vendors to report actual values of deviation before recalibrating equipment to permit review of any previous work.

3c) The calibration records of recorders were confused by having two recorders identified on one record and the acceptability of the records could not be determined.

Response: There are separate calibration certificates for each recorder on file attesting to their acceptability. The Calibration Inspector recorded both instruments on one card.

Corrective Action: Separate record cards for each instrument are prepared and now on file. This has no effect on work performed.

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.

Response: There was a strike during the period June, 1974 to November, 1974. Calibrations were allowed to lapse. Both were recalibrated as soon as needed.

No Corrective Action required.

3e) Magnetic Particle Test Equipment Y-6 has no documentation to verify calibration.

Response: Magnetic Particle Equipment consists of yoke type equipment. Calibration consists in determining whether yoke is capable of lifting a 10 lb. weight. No tolerance is involved. A card is on file which indicates the yoke capacity was checked as required.

No Corrective Action required.

3f) There is no documentation available to verify calibration of "Tong Test" amp meters.

Response: There are calibration certificates from the subcontractor and cards in the calibration file attesting to the documentation.

No Corrective Action required.

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.

Response: Tong Tester mentioned is of the 0-1000 range. It is rarely used. It was not used in the December 1976 to January 1977 period and so noted on the calibration card file.

No Corrective Action required.

3h)

Storage requirements for instruments are not specified.

Response:

There are no specific requirements for construction equipment storage and consequently no written instructions were prepared.

Tong Testers, micrometers, hydrotest gages, and small torque wrenches are stored in locked file cabinets in the Q.A. office.

Temperature recorders are normally in use, but when stored, are in a heated warehouse. Large torque wrenches are stored in a heated warehouse.

ESD-213 environmental control indicates that each Q.A. Inspector is responsible for calibrated tools in his area.

No Corrective Action required.

CRITERION XIII. HANDLING, STORAGE, AND SHIPPING

FINDING 1. Procedures ESD-202, 215, 217, 222, 223, 240, 259, and 261 provide some information relative to handling and storage of materials, parts, and components for the total scope of the Pullman Power Products effort.

Response:

No comment.

No Corrective Action required.

FINDING 2.

Procedures for storage are generally inadequate. Procedures ESD-222- "Control Valves" and ESD-202, "Weld Material Withdrawal and Control" are specific and adequate. Procedure ESD-215, "Visual Inspection", provides some guidance on storage. There is very little information relative to how specific items are to be stored or the delineation of storage areas relative to the protection each area provides.

Response:

In general, storage conforms to N452.2. All large pipe materials are stored outside on dunnage in drained areas and were properly closed to prevent intrusion of dirt, etc. Valves and other items were stored in warehouses. Weld material was properly stored as indicated in ES-202. Please note Finding 6 below.

No Corrective Action is contemplated.

FINDING 3.

Procedure ESD-240 requires a segregated storage area for "scrap" material, and Procedure ESD-215 requires separate areas for material with Hold Tags and for P1 P8 material separation. These procedures are adequate. However, they do not relay much information on how these segregated areas are to be established and maintained segregated.

Response:

It is significant to note that the auditors found the storage areas in excellent condition. (See Finding 6 below). The main concern is that proper, segregated storage is used. There are a variety of ways this can be accomplished, i.e., roped off areas, separate storage bins, pallets, etc. We use any or all of these procedures depending on the specific circumstances.

No Corrective Action contemplated.

FINDING 4.

There are no procedures or manufacturers' instructions for the storage of flow indicators and strainers, which were stored in the Pullman Power Products storage area.

Response:

These items are stored on the same fashion as valves. We fail to see why any special instructions are required.

No Corrective Action required.

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 no 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.

Response:

Materials, parts, components, valves, etc. were handled in accordance with ESD-215 issued September, 1971 and ESD-222 issued February, 1972. We also point out that our Quality Assurance Manual KFD-19 which was part of our program from the beginning, requires maintenance and surveillance of spools, hangers, valves, etc. on a monthly basis. Quality Assurance Instruction 94 and PG&E Specification 8711 also give requirements for handling and storage.

Our Pipe Support Manual Section KFPS-6 describes storage and handling, and KFPS-17 describes maintenance and surveillance. Prior to issuance of ESD-259, Grinnell Snubbers were controlled under ESD-215. All Grinnell Snubbers have been reinspected and tested in accordance with ESD-259 procedure on both units.

No Corrective Action contemplated.

FINDING 6.

The present storage areas were found to be in excellent condition, with areas clearly defined, materials supported on adequate dunnage, and openings capped.

Response:

This finding confirms proper storage is implemented despite alleged inadequate instructions in the above findings.

No Corrective Action required.

FINDING 7.

Procedures KFP-19, KFPS-17, and ESD-222 provide for an adequate storage surveillance program. Prior to October 31, 1973, the surveillance was performed using a check-sheet that contained the storage requirements; after October 31, 1973, the checksheet was changed so that the storage requirements were not listed. While the surveillance program appears adequate, the checksheet used after October 31, 1973 does not appear adequate.

Response:

The original checklist applied to valves in particular during the period of time when valves were a significant part of the storage.

After October 31, 1973 when valve storage was significantly reduced, surveillance of valves was incorporated in with other materials.

We feel the original checklist is too detailed and the current one is satisfactory.

No Corrective Action required.

CRITERION XIV. INSPECTION, TEST, AND OPERATING STATUS

FINDING 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.

Response:

The Field Process Sheet is intended to fulfill the requirements for field welding in particular. Steps taken to erect a piping sub-assembly are not necessarily quality related, and are quite obvious. They need not be indicated on the Process Sheet.

Cleaning prior to installation of insulation is a totally separate operation on a system basis and does not appear on a process sheet but is controlled by special procedure.

Critical welding steps such as preheat, gas flow, oxygen content of backing gas are all part of the Welding Procedure Specification and it is felt they need not be repeated on each process sheet.

The Process Sheets give the required specific instructions for weld fitup and inspection as required by Code.

Recent revisions to the Process Sheet include more specific procedure requirements.

No further Corrective Action required.

FINDING 2.

The Hold Tag mechanism described in Procedure ESD-240 is an acceptable method of exhibiting status when a defective or discrepant condition is noted.

Response:

No comment.

No Corrective Action required.

FINDING 3.

The method of using the Field Process Sheet, the Hold Tag, and the Discrepancy Report is an acceptable mechanism to track the status of a discrepant condition and the final disposition of that condition. However, the mechanism is not always utilized.

3a.

DMR-604, dated February 14, 1973, for isometric package 1-03-1 required rework and reinspection of 14 Class B welds. There are no Field Process Sheets or Inspection Reports to demonstrate that the work had been performed.

Response:

Comment is incorrect. DMR-604 for isometric 1-03-1 has no Class B attachments indicated. There are Class C attachments which are documented and inspected in accordance with the DMR.

3b.

The Field Process Sheet for FW-347 states that the weld was cut out in accordance with a specified DR. The referenced DR is not applicable to cutting out FW-347.

Response:

DR-1247 was written to cover rerouting of the line and the addition of FW-347. This DR is referenced on the original process sheet.

FW-347 was cut out and rewelded to facilitate installation of other work. Reweld is complete and correctly documented. The as-built condition is documented.

No Corrective Action required.

FINDING 4.

The method of indicating repair welds, as described in Procedures ESD-203 and 204, and the notation of repair welding on the Field Process Sheet are acceptable for showing repair status. However, FW-83 (Isometric Package 1-10-9) and FW-348 (Isometric Package 04-500-FW-83) are not stamped "R" to indicate repair.

Response:

See Criterion X, Finding 9, the same response applies to FW-348.

The Corrective Action taken applies also.

FINDING 5.

Procedures KFP-8 and ESD-239 do present some information relative to the release of the systems for hydrostatic testing. Procedure ESD-229 does contain a method of indicating hydrostatic test status. These mechanisms are acceptable. Procedure ESD-229 should reference Procedure ESD-239 and require that the release be confirmed prior to initiation of the testing.

Response:

This again applies to procedures not to the quality of the installation work.

Corrective
Action:

ESD-229 will be revised to cross reference ESD-239.

FINDING 6.

Paragraph 8.12 of Procedure KFP-8 requires that the Field Process Sheet be maintained in the area where the line is being installed. This requirement has been interpreted as having the Field Process Sheet in the area inspectors' station and not as being available to the foremen and the people performing the work while the work is in process. This practice causes the Field Process Sheet to become an inspection sign-off record, rather than a traveler that presents necessary information to all individuals involved in the performance of the work.

Response:

This is a requirement of our original Q.A. program. The inspection station serves as a focal point for work being performed in the area and controlled by the individual inspector. Process sheets and other requirements are reviewed with the foreman and welders prior to the work. The Process Sheet is available at all times.

Since the Process Sheet is a permanent record needed for final documentation, it was decided to retain them at the inspector station. Distribution directly to the foreman might result in loss or damage which would destroy prior records. This procedure furnished control required.

No Corrective Action required.

FINDING 7.

Paragraph 7.2 of Procedure KFPS-7 requires that the foreman or pipefitter procure a drawing and Process Sheet prior to starting work and checkoff operations as completed. There was no evidence that this practice (which is in conflict with KFP-8) is observed.

Response:

Since hangers are more spread out and loss of process sheets for hangers were not considered as critical as those for pressure welds, the procedure of KFPS-7 was established in 1973. Process Sheets are issued with each hanger drawing and are completed as required as work progresses. These drawings and process sheets are on file in Q.A. vault for all completed and accepted work.

No Corrective Action is required.

CRITERION XV. NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

FINDING 1. Procedures KFP-10, KFPS-9 and ESD-240 describe an adequate system of identifying nonconformance.

Response: No comment.

No Corrective Action required.

FINDING 2. Procedure ESD-240 does not adequately describe the actual process by which Nonconformance and Discrepancy Reports are processed.

Response: We disagree ESD-240 does adequately describe process. If specifics were listed, we could better evaluate this finding. No Corrective Action contemplated at present.

FINDING 3. The Pullman Power Products/Pacific Gas & Electric Co. interface relative to Discrepancy Reports is not described.

Response: ESD-240 requires approval of all DR's and NCR's by PG&E. Specific individuals contacted are not mentioned. This will be corrected under Criterion I, Finding 6.

No further Corrective Action required.

FINDING 4. Procedure ESD-240 does contain adequate information relative to disposition and close-out (use of logs) for Nonconformance and Discrepancy Reports.

Response: No comment.

No Corrective Action required.

FINDING 5. Systems that circumvent the nonconformance system have been established. Use of Note-O-Grams and Rejection Notices to denote discrepancies usually precludes their pickup on a subsequent RN or DR. The use of these alternate systems removes the controls and reviews that have been integrated into the RN and DR system and also prevents information relative to the number and types of problems from being identified. These alternate systems are unacceptable.

Response:

DR's are written to cover deviations which are found after an item has been completed and presented for inspection.

During the course of a job, it is necessary to call attention to status of items still in progress, but not yet presented for inspection. Note-O-Grams are an internal type of communication regarding the work in progress. They were introduced to reduce the risk associated with verbal communication.

Rejection Notices were also introduced to call attention to conditions which must be corrected before presenting for final inspection. They are also written to preclude mix-up associated with verbal communication. They are similar to the weld repair orders used when unacceptable indications are found by RT, PT, or MP.

Once again, we must emphasize that deviations or non-conformances are defined as unacceptable items found after the item is considered complete and has been presented for inspection.

No Corrective Action required.

CRITERION XVI. CORRECTIVE ACTION

FINDING 1.

Procedures KFP-10, KFPS-9, and ESD-240 describe a corrective action system. The corrective action system is inadequate in that it does not require:

- a. Categorization of reported discrepancies to permit evaluation and tracking.
- b. Documentation of all discrepancies.
- c. Inclusion of documented discrepancies in the RN and DR system, i.e., discrepancies reported in Note-O-Grams are not subsequently written as a RN or DR.
- d. Tracking of discrepancies to determine which discrepancies are recurring.
- e. Analysis of discrepancies to determine programmatic problems.
- f. Reporting of significant conditions adverse to quality and the corrective actions taken to appropriate levels of management.

Response:

At the time of the contract, Corrective Action requirements meet the requirements of the Contract and Codes.

- a. Lack of a procedure for categorization may have resulted in repeated deficiencies, however, each discrepancy as defined by the Q.A. Manual was reported on a DR. Appropriate disposition was made and steps were taken to prevent reoccurrence. Current Corporate Procedures do cover this situation.
- b. Documentation of all discrepancies are reported as required by KFP-10 of Q.A. Manual. Discrepancies that can be corrected in the normal course of construction are not required to be reported on a DR.
- c. Items written on Note-O-Grams to expedite incomplete work, is not considered a discrepancy and is not subsequently reported on a DR.
- d. Tracking of Discrepancies - see response to Item 1 of Finding 1.
- e. Analysis of discrepancies to determine programmatic problems - see response to Item 1 of Finding 1.
- f. Reporting of significant conditions adverse to quality are reported via a monthly Q.A. Report and copies of all significant DR's are sent to Director of Quality Assurance for evaluation and recommendations.

Response:
(Cont.)

No Corrective Action is required.

FINDING 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.

Response:

This is a very general statement. Each time a discrepancy is found, Corrective Action was taken to insure compliance with the contract and regulatory requirements.

It is recognized that there were some problems in the past. It should be noted that these problems were detected and dispositioned. Corrective actions were implemented in the form of revised procedures, further training of field inspectors and additional inspection points. Examples of these are; rewritten procedure for hanger installation and inspection, inspection points established for installation of concrete anchors, established a requirement that all radiographs be reviewed by a Level III or second Level II individual.

Corrective
Action:

We have performed an internal review to determine if other quality deficiencies exist. No additional deficiencies were noted.

FINDING 3.

There is no procedure for reporting 50.55(e) deficiencies.

Response:

10 CFR 50.55(e) requires the holder of the permit (PG&E) to notify the commission of each fault in design and construction. Our DR System reports all such deficiencies to the owner. It is his obligation to report any he determines may adversely effect plant safety if uncorrected.

CRITERION XVII. QUALITY ASSURANCE RECORDS

FINDING 1. Procedures KFP-16 and KFPS-14 and most of the ESD procedures adequately identify the records to be retained.

Response: No comment.

No Corrective Action required.

FINDING 2. Procedures KFP-14 and KFPS-12 provide adequate guidance and mechanisms to assure collection of most records. Records that are not specified in these two procedures (e.g., records on heat treatment, torquing, pipe rupture restraints) do not have any documented mechanisms for collection, but are adequately assembled and retained.

Response: No comment.

No Corrective Action required.

FINDING 3. There are no procedures for filing, storing, and protecting records, i.e., no requirements for the vault, no method on how records other than isometric packages are identified, no instructions on how records are to be stored. However, the practices employed do provide for adequate identification, retrieval, and fire protection.

Response: The finding notes adequate systems, but wants specific instructions. Some are included in ESD-212.

Corrective Action: Revise ESD-212 to more specifically reference storage methods.

FINDING 4. Procedure ESD-212 does adequately describe a security system that provides "out" cards for identification of the record and the individual using the record and for the overall security of the records within the vault.

Response: No comment.

No Corrective Action required.

CRITERION XVIII. AUDITS

FINDING 1. Procedures KFP-18, 19, 21; Procedures KFPS-16, 17, 18; and Procedures ESD-219 and 222 describe an adequate audit program.

Response: No comment.

No Corrective Action required.

FINDING 2.

The audit program does not require the use of checksheets or procedures to delineate the scope and extent of the audit, nor does it require that the audit team leader be qualified.

Response:

At the time the audit program was instituted, audit reports were made in narrative form. See Q.A. Manual KFP-18, Paragraph 18.4.

When preliminary issues of N45.2.12 and N45.2.23 were first available in 1975, Corporate Quality Assurance prepared necessary auditing procedures and qualified audit team leaders as required, to perform the auditing required at 6 month intervals of the site by Central Staff personnel. This is all outlined in Corporate Procedure XVIII-1 available from the site Q.A. Manager.

Corporate procedures do use check sheets but Internal Audits by field Q.A. do not necessarily require their use.

Corrective Action:

Use of checksheets has been incorporated as a requirement when internal audits by site Q.A. personnel are performed.

FINDING 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.

Response:

Management audits of the Diablo facility were started 9/19/72 and have been conducted at periodic intervals since that time. There is a record of nine management audits on file from the time period of 9/19/72 through 6/21/77. These audits clearly detect and define areas of deficiencies, and are followed by recommended corrective action for implementation. Verification of the adequacy of the implementation of corrective action was verified on subsequent audits conducted by management personnel. We disagree with the statement in audit findings that these management audits appear to have been ineffectual.

No Corrective Action required.

FINDING 4.

Procedure KFPS-16 does not require management audits.

Response:

The ASME approved Q.A. Manual requires management audits. It covers the entire scope on site including hangers. KFPS was written only to supplement it.

No Corrective Action required.

FINDING 5.

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

Response:

KFP-18 and KFPS-16 specifically reference narrative reports and use of check sheets was not required.

See Corrective Action audit Finding 2 above.

FINDING 6.

There are no procedures for audit reports, audit responses, and time limitations on responses.

Response:

Corporate procedure XVIII-1 covers all these requirements and is available at job site.

No Corrective Action required.

FINDING 7.

Procedures KFP-18 and KFPS-16 require that a copy of the audit report be transmitted to the Manager of Quality Assurance.

Response:

No comment.

No Corrective Action required.

FINDING 8.

There are no requirements that the Manager of Quality Assurance track the audit reports or take any corrective actions when programmatic or recurring deficiencies are noted.

Response:

Q.A. Manual KFP-18 require that audit findings be reviewed by the Q.A. Manager. He must assure corrective action has been taken. This requirement covers programmatic or recurring deficiencies. Corporate Procedure XV-2 for non-conformance requires evaluation of non-conformances to determine whether they are programmatic or recurring, and outlines required steps to do so.

No Corrective Action required.

FINDING 9.

There are no requirements for periodic, independent, internal audits of the total quality program.

Response:

There are no Regulatory Code or Customer requirements for independent audits. Use of independent audits is a mechanism used by Pullman to review the adequacy of their work and program. Independent groups have been employed on occasion to obtain alternate views.

No Corrective Action required.

FINDING 10.

One independent internal audit was performed in January, 1976.

Response:

No comment.

No Corrective Action required.

PG-1E
FOR INTRA-COMPANY USES
ATTACHMENT 4
DIVISION OR
DEPARTMENT **QUALITY ASSURANCE**

FILE NO.

RE LETTER OF

SUBJECT

**Pullman Power Products
Quality Assurance Program
Audit No. 80422**
June 13, 1978
MR. J. D. WORTHINGTON:

Attached is the report of an audit conducted by the Quality Assurance Department to determine the adequacy of the quality assurance program implemented at Diablo Canyon Power Plant by Pullman Power Products. The report concludes that, in general, the Pullman program meets applicable requirements. However, three programmatic deficiencies and three deficiencies in the implementation of established procedures were noted.

Two Nonconformance Reports and four Minor Variation Reports were initiated by the General Construction Department. General Construction personnel are working closely with Pullman's management in correcting the deficiencies identified. Resolution of these deficiencies will be verified by the Quality Assurance Department.

R. P. Wischow
R. P. WISCHOW

VLK: CL Eldridge (3694):cn
cc: **JRAdams**
RSBain
WHBarr
HPBraun
JCCarroll
PACrane, Jr.
JBHoch
DVKelly
FCMarks
FFMautz
CEMaxfield
EDRamsay
HWReynolds
GVRichards
JOSchuyler
CHSedam
BWShackelford
MRTresler
RWWhite

PACIFIC GAS AND ELECTRIC COMPANY
QUALITY ASSURANCE DEPARTMENT

Title: Pullman Power Products Quality Assurance Program
Audited Organization/
Facility: Pullman Power Products at Diablo Canyon Power Plant
Auditors: M. E. Leppke (Lead Auditor)
C. L. Eldridge
R. W. Taylor
Dates Performed: April 2 - June 1, 1978

1.0 Scope

This audit was performed with three objectives in mind. They were:

- (a) Verify that the Pullman Power Products Quality Assurance Program implemented at the site meets contract requirements and the requirements of applicable regulations, codes, and standards.
- (b) Review objective evidence to determine the validity of the findings of an audit performed by Nuclear Services Corporation (NSC) in 1977 and determine if Pullman's responses were accurate and appropriate.
- (c) Observe the as-installed condition of components and support fabricated and installed by Pullman to verify adherence to applicable specifications, design drawings, and quality standards.

2.0 Conclusions and Exit Interviews

2.1 Conclusions

The Pullman Power Products Corporate QA Program and the implementation thereof were reviewed in light of the audit performed by Nuclear Services Corporation. Additional audit activities included a review of the installed hardware. The primary conclusions are given below with additional details set forth in Appendix A.

(a) Adequacy of the Pullman Power Products QA Program

The Quality Assurance Program implemented by Pullman Power Products essentially fulfills contract requirements and meets requirements of the ASME Boiler and Pressure Vessel Code, 1971 edition. However, three program deficiencies were identified and three deficiencies in the implementation of established procedural requirements were noted. Two Nonconformance Reports and four Minor Variation Reports were initiated by General Construction. Areas were also identified where it appears to be to Pacific Gas and Electric Company's advantage to upgrade program elements though no violations of applicable regulations, standards, or the contract are apparent.

(b) Evaluation of the Nuclear Services Audit of Pullman Power
Products QA Program

Several apparently generic deficiencies in work performed by Pullman were previously identified by the General Construction Department. As a result, extensive reinspections were directed or performed by the General Construction Department. Additionally, Pullman was asked to perform an overall evaluation of the acceptability of the installed components and support. An independent party, Nuclear Services Corporation (NSC) was contracted by Pullman to perform this evaluation. However, the resulting audit did not achieve its main objective in that NSC concentrated almost entirely on Pullman's Quality Assurance Program and inspected very little of the installed hardware to determine the quality of the work.

NSC's audit findings allege that major portions of Pullman's program are inadequate. It is essential to understand the requirements which NSC audited against to place the NSC audit findings in perspective. The audit checklist used by NSC states that requirements for the NSC audit were extracted from the following sources:

- a) 18 Criteria (10CFR50 Appendix B)
- b) Grey Book (WASH. 1283 "Guidance on Quality Assurance Requirements During Design and Procurement Phase of Nuclear Power Plants")
- c) ANSI Standards
- d) Nuclear Services Corporation (internal guidelines)

The 18 criteria of 10CFR50 Appendix B are applicable. Chapter 17.1 of the Diablo Canyon Final Safety Analysis Report commits to a quality assurance program meeting the intent of 10CFR50 Appendix B. Pullman's program also commits to the ASME Boiler and Pressure Vessel Code (CODE), 1971 edition for quality assurance requirements. The 1971 Code is consistent with the requirements of 10CFR50 Appendix B.

The WASH 1283 document (Grey Book) is not applicable. Chapter 17 of the Diablo Canyon Final Safety Analysis Report makes no commitment to WASH 1283 for the design and construction of Diablo Canyon. WASH 1283 endorses ANSI N45.2, 1971 and ANSI N45.2 series standards. ANSI N45.2 states in its foreword that it is not applicable to work performed in accordance with the Code. ANSI N45.2 series standards state under "Scope" that they are intended for use in conjunction with ANSI N45.2, 1971.

The ANSI Standards are not applicable for the same reasons expressed for WASH 1283.

Internal NSC corporate guidelines only represent the opinions of the auditors and are not interpreted by PGandE as requirements.

Many NSC audit findings state that elements of Pullman's program are inadequate but specific deficiencies and references for requirements are not identified. Some actual deficiencies were identified by the NSC auditors but many of their findings appear to represent the auditor's opinions with no bases in applicable regulations, codes, or standards.

The audit performed by the PGandE QA Department essentially retraced the steps of the NSC auditors. Deficiencies identified are listed in Appendix A. Other alleged deficiencies stated by NSC do not appear to be supported by objective evidence or do not appear to be based on applicable codes, regulations or standards.

Pullman's responses to the NSC audit findings in general appear to be correct. However, to place the NSC audit findings in proper perspective, Pullman should have assessed the applicability of requirements which NSC alleged that Pullman violated.

(c) Evaluation of the Pullman Power Products Corporate Audit of the Unit 2 Hardware Installed by Pullman Power Products Corporation

In February 1978 Pullman's corporate office performed an audit to verify that Unit 2 hardware items were installed in accordance with design drawings and specifications. One hundred twenty-two hangers, restraints, and snubbers and seventy-seven isometric drawing packages were inspected; no discrepancies were noted by the Pullman Power Products auditors.

Approximately half of the items inspected by the Pullman audit team were reinspected by PGandE during this audit; several discrepancies were noted. In light of the number of discrepancies noted, it is apparent that the Pullman audit did not effectively evaluate the quality of their work.

Most of the discrepancies noted appear to be minor in nature. Similar problems identified by reinspections in other areas have generally been "accepted as is" by the PGandE Engineering Department. However, an overall assessment of the situation still should be done to determine whether additional reinspections should be performed and the scope thereof. Pullman's management agreed, during a meeting held on May 25, 1978, to send additional qualified staff to the site to perform the required evaluation. General Construction plans to direct the performance of the Pullman evaluation.

MVR M-3725 and M-3726 were initiated by General Construction to document and provide for resolution of the noted discrepancies.

2.2 Exit Interviews

Two preliminary meetings and a final exit meeting were held to discuss the audit findings and to establish the recommended corrective actions.

(a) Preliminary Exit Meeting (May 10, 1978)

A meeting was held on May 10, 1978 to discuss the results and preliminary findings of the audit of the Pullman Quality Assurance Program and of the overall pipe and pipe support inspections. The following personnel attended:

<u>General Construction</u>	<u>Quality Assurance</u>	<u>Engineering</u>
C. K. Maxfield	R. P. Wischow	J. B. Hoch
M. R. Tresler	V. L. Killpack	
R. Etzler	M. E. Leppke	
G. Arnold	C. L. Eldridge	
	R. W. Taylor	

(b) Preliminary Exit Meeting (May 25, 1978)

A meeting was held on May 25, 1978 to discuss corrective actions with General Construction and Pullman Power Products. The General Construction Department directed Pullman Power Products to perform the required corrective actions. Those in attendance were:

<u>Pullman Power Products</u>	<u>Quality Assurance</u>	<u>General Construction</u>
M. Evans	V. L. Killpack	C. K. Maxfield
P. Runyan	M. E. Leppke	M. R. Tresler
J. Ryan		R. Etzler
A. Eck		

(c) Final Exit Meeting (June 1, 1978)

A final exit interview was held on June 1, 1978. Audit findings and agreed-upon corrective actions were summarized. All deficiencies identified during the audit had been documented prior to the exit interview by General Construction on Nonconformance Reports or Minor Variation Reports. Those in attendance were:

<u>General Construction</u>	<u>Quality Assurance</u>
C. K. Maxfield	R. P. Wischow
M. R. Tresler	V. L. Killpack
R. Etzler	M. E. Leppke
G. Arnold	C. L. Eldridge

As a result of this audit the following Nonconformance Reports (NCRs) and Minor Variation Reports (MVRs) were written by the General Construction Department to resolve the problems identified:

<u>NCR</u>	<u>Description</u>
DC-78-RM-004	Documents the lack of program definition and lack of detailed audit schedule.
DC-78-RM-005	The relative responsibilities of QA and production are not clearly established.

<u>MVR</u>	<u>Description</u>
M-3723	Pullman Corporate Management audits were not performed at the scheduled frequency.
M-3724	Hold points were bypassed.
M-3725	Hardware discrepancies were noted.
M-3726	Discrepancies concerning isometric drawing packages were noted.

Corrective actions were agreed upon; the QA Department will verify the resolution of these nonconformances and deficiencies.

Prepared by: M. E. Leppke by V. L. Killpack
M. E. Leppke

C. L. Eldridge
C. L. Eldridge

R. W. Taylor by V. L. Killpack
R. W. Taylor

Approved by: V. L. Killpack
V. L. Killpack

R. P. Wischow by J. H. Leppke
R. P. Wischow

APPENDIX A

In this section, the deficiencies which were identified as a result of the audit are discussed. The problem in each instance is identified to a specific Nonconformance Report (NCR) or Minor Variation Report (MVR) that was initiated by the General Construction Department.

In addition, non-mandatory suggestions and recommendations of program improvements are given for consideration.

1.0 Program Deficiencies

Two Nonconformance Reports were initiated for the three identified deficiencies.

(a) Nonconformance Report No. DC-78-RM-004

This NCR is comprised of two parts as follows:

- (1) The Pullman Power Products Quality Assurance Program is not adequately defined. The ASME Boiler and Pressure Vessel Code, Section III, paragraph NA4140 of the 1971 edition requires that the Quality Assurance Program be documented in detail in a manual consisting of written policies, procedures, and instructions. Corporate Procedure No. XVIII-1 is presently being used for the performance of management audits of field activities. Corporate Procedure No. VII-1 is being used for qualifying vendors for the Approved Vendors List. These procedures implement Quality Assurance requirements of the contract but are not identified as part of the program and revisions are not controlled by the program.

The program is required to be approved by the ASME, and changes to the manual are to be approved by the Authorized Inspection Agency. KFP-1, paragraph 1.13 states that Engineering Specifications (ESDs) shall be part of the program. Most ESDs appear to be implementing procedures, but some define actual program elements. For example, ESD-240 establishes the Noncompliance Report (NCR) system. No evidence could be found to indicate that ESD-240 has been reviewed and approved by the ASME or the Authorized Inspection Agency.

It is not clear which manuals and procedures are applicable to specific activities. The pipe support manual is considered by site personnel to be a supplement to the piping manual. The piping manual is approved by Pullman's Vice President but the support manual is only approved by the field QA Manager. However, the front page of each manual indicates that it establishes the quality requirements for work performed under that manual. The defined scope of each manual indicates that the two apply to different construction activities.

Engineering Specifications appear to supplement one or both manuals or independently establish quality assurance program requirements. Special QA instructions are written to supplement and clarify Engineering Specifications or procedures in one or both manuals.

Recommended Corrective Action

- (a) Write a program description which clearly identifies the documents that are to be considered part of the total quality assurance program and establish the hierarchy of the documents (where necessary obtain approval by the proper authority).
 - (b) Define approval requirements for the above documents and for revisions and obtain approvals where necessary. (For example, approval requirements are not provided for special QA instructions).
 - (c) Clearly define the scope of work to which the above documents are applicable. (For example, do requirements of the piping manual apply to pipe support work?)
 - (d) Review the program to insure that supplementary procedures do not include requirements which conflict with requirements of the procedures they supplement. Several KFP procedures require the involvement of the AI. Corresponding KFPS procedures allow work to be done without AI involvement. KFPS procedures clearly cannot supplement KFP procedures without revising the KFP procedures to allow waiving AI involvement on non-Code work. (Example: KFP-7 and KFPS-6).
- (2) PGandE Specification 8711 and the 1971 Code, Section III, paragraph NA4700 require a comprehensive system of planned and periodic audits to be carried out to assure compliance with all aspects of the Quality Assurance Program.

Procedure KFP-18 states in its scope that it establishes such a system. However, two types of audits, management audits and internal audits, are described. The procedure does not establish the scope of either type of audit and no detailed schedule has been developed to show that all aspects of the program are being audited. Furthermore, audit records at the site do not indicate that all aspects of the program are being audited. Records do not indicate that management audits have been performed on pipe support work. An unofficial, unapproved internal audit schedule exists, but it has not been followed consistently and few ESDs appear on the schedule. A March 1977 internal audit erroneously states that KFP-3, -5, -9, and -14 are not to be audited as they do not apply to Diablo Canyon. Internal audit schedules for October, November, and December 1977 and January 1978 were not met.

Recommended Corrective Action

Establish and implement a detailed audit schedule to assure compliance with Specification 8711 and the Code.

(b) Nonconformance Report No. DC-78-RM-005

PGandE Specification 8711, Section 4, paragraph 3.11 requires that Quality Control personnel perform only quality control functions and that they be free of scheduling and production pressures.

A review of procedures and work in progress indicates that Quality Control inspectors' independence from scheduling and production pressures is not assured by the program as written. Procedures do not clearly indicate that it is the Production Department's responsibility to read and use the process sheet insuring that steps are performed in the required sequence and hold points are observed.

During the course of this audit, it was noted that two hold points were bypassed on FW #362 (see Section 2.2 below). Discussions with individuals involved indicated that the Quality Control inspector was expected to follow the work and ensure that inspections were performed at hold points indicated on the traveler. The Foreman apparently had not read the traveler and was unaware that hold points existed. A QC inspector should not be responsible for directing the course of construction to ensure that hold points are observed, particularly if he also signs off these hold points.

Pullman's procedures identify the Field QA/QC Manager as responsible for ensuring that most Quality Assurance Program functions are performed. Field QA personnel had already determined that some procedures needed to be revised to clarify or redefine responsibilities to ensure that production responsibilities are not assigned to QA/QC personnel. The Assistant Field QA Manager has drafted revisions to three pipe support manual procedures and is reviewing others to determine whether revisions are needed.

Recommended Corrective Action

- (a) Revise KFP-8 and KFPS-7 to clearly state that production is responsible for following the traveler and ensuring that hold points are observed. QC should only be responsible to inspect or audit.
- (b) Review procedures and practices to verify that QC is neither procedurally nor functionally placed in situations where their independence may be compromised. Revise procedures as necessary.

- (c) Perform the training necessary to ensure that production and QC personnel fully understand their relationship and the functions they are expected to perform.

2.0 Deficiencies in Implementation of Procedures

Four Minor Variation Reports (MVR) (M-3723; M-3724; M-3725, and M-3726) were initiated by General Construction for the identified deficiencies.

(a) Minor Variation Report No. M-3723

Records indicate that management audits have not been performed by Pullman Power Products Corporation at the specified frequency. Management audits are required by KFP-18 to be performed at least every six months. Since December 1975, audits have been performed at eight to ten month intervals.

Recommended Corrective Action

Conduct audits at required intervals or change the requirements.

(b) Minor Variation Report No. M-3724

On April 25, 1978, work in progress was inspected to verify that the Field Process Sheet was being used as required by procedure KFP-8. It was noted that the repair work on FW #362 had proceeded to step 4 on the Field Process Sheet. The Field Process Sheet was in the custody of the area QC Inspector. Inspection of the Field Process Sheet indicated that, contrary to KFP-8, paragraph 8.4, work had proceeded beyond two hold points and the designated inspections had not been performed.

Corrective Action

The Field QA/QC Manager issued Nonconformance Report #265 and agreed to write a procedure requiring the issuance of a Field Process Sheet to production. The procedure is to clearly define responsibilities for using and completing process sheets.

(c) Minor Variation Report No. M-3725

Minor Variation Report M-3725 was initiated to document the following hardware discrepancies, noted by the PGandE QA Department, to facilitate their resolution.

Support or Isometric	Description of Discrepancy
47-69R	Vertical clearance is 1/2" should be 1/16"
47-70R	Vertical clearance is 1/2" should be 1/16"
* 46-17R	Clearance is 3/16" should be 1/16"
	Weld Item 2 to 1 not all around
77-12SL	Snubber installed on wrong pipe
* 77-14SL	No torque seal
23-7V	Location Item 7 is 5/8" should be 4"
* 23-8V	Weld Item 9 to pipe not all around
23-5R	Clearance Item 12 is 1/4" should be 1/8"
23-12R	Missing anchor bolts
23-16R	Grinder Gouges 3/32" deep.
**	Loose bolt
*	Clearance is 1/8" should be 1/16"
23-66R	Clearance is 0" should be 1/16"
* 947-1R	Weld Item 1 is not all around
90-44R	Weld Item 9 is not all around
* 90-45R	As-built does not reflect added shim
* 90-47R	Weld Item 6 only tacked
90-48R	As-built does not reflect added weld
* 96-6V	5/8" rod used in lieu of 1/2" rod
90-46A	Weld Item 2 is 5/16" should be 3/8"
72-19SL	Weld Item 4 not both sides
* 6-4R	Weld on attachment is 1/4" should be 3/8"
6-28R	Fabrication of "t" shoe not to as-built
* 6-6V	Dimension is 3'-1 1/2" should be 2'-11 11/16"
6-8V	No load on support, not tightened
2730-61	No Clearance "t" shoe to clip
2730-63	Broken stud
2730-65	No clearance "t" shoe to clip
2730-66	No clearance "t" shoe to clip
2730-42	Clamp loose, wrong location
2730-21	No clearance "t" shoe to clip
935-23	Brace weld not all around
935-24	Brace is 45° should be 55°
935-25	Configuration opposite to DWG.
935-27	Brace weld not all around

* These items were accepted as-is by General Construction during the course of the audit.

** Item was corrected during the course of the audit.

(d) Minor Variation Report No. M-3726

Minor Variation Report No. M-3726 was initiated to document the following discrepancies noted in isometric drawings to facilitate their resolution:

Support or Isometric	Description of Discrepancy
2-3-18	ISO shows check valve as Spec 8729 Item 17 (Velan). Installed valve is Spec 2550 (Weston Hyd.)
2-3-19	Same as 2-3-18
2-4-418	Line 1058; dimension shown as 2'-8" is 1'-8".
2-9-478	F.W. 858 is etched on two welds
2-12-5	F.W. 170 is stamped 176
2-14-14	Detail for PX263 refers to pump 2-1, should be 2-3.
2-3-418	F.W. 1390, 1391, & 1392 are shown by the process sheet to have been performed using stainless steel 309 rod. Joints are all carbon to carbon. Note: Documentation was determined to be incorrect. The correct rod was verified to have been used.

3.0 Recommendations

Several comments and recommendations for program requirements were presented for consideration to the General Construction Dept. during exit interviews and are summarized as follows:

(a) Schedule for Implementation of Commitments

A schedule for implementation of the following commitments should be established:

Training program - added to KFP-1, 12/23/77.

Use of internal audit checklists - made in draft responses to NSC audit.

Issue a procedure requiring a process sheet to be issued to production. Commitment of 4/25/78.

Implementation of corrective action resulting from this audit.

(b) Pullman Problem Reporting Procedures

These procedures should be revised to facilitate determining and verifying corrective actions.

The following changes are recommended:

Issue internal audit findings as NCRs.

Expand the use of NCRs to cover all conditions adverse to quality which are not covered by DRs.

Require the cause as well as the corrective action to prevent recurrence to be documented.

Establish a management review system for DRs and NCRs to identify trends.

(c) Inspector's Certification

The Pullman inspector's certification card should be amended to eliminate the claim that inspectors are qualified to ANSI N45.2.6 or inspectors should be qualified in accordance with its requirements. A review of ESD-237 and qualification records indicates that some Pullman inspectors are not qualified to ANSI N45.2.6.

(d) Description of Supervisory Responsibilities

The KFPS (pipe support) manual assigns specific quality functions to the "Hanger Engineering Supervisor". The responsibilities and duties of this position should be defined in the program.

(e) Special QA Instruction Index

An index for special QA instructions should be prepared. This index should identify the procedures being amplified and the subject being addressed.

(f) Update Pipe Support Procedure KFPS-7

The process sheet shown in KFPS-7 is Revision 7 and the process sheet shown in ESD-223 is Revision 8. The latest revision of the process sheet should be placed in KFPS-7 or the process sheet should be removed from the procedure.

PG-E**FOR INTRA-COMPANY USES****ATTACHMENT 3**DIVISION OR
DEPARTMENT**QUALITY ASSURANCE**

FILE NO.

RE LETTER OF

SUBJECT

**Review of Nuclear Services Corporation
Audit Findings****June 16, 1978****MR. R. S. BAIN:**

An audit of the Pullman Power Products quality assurance program was conducted at Diablo Canyon Power Plant by Nuclear Services Corporation (NSC) in August and September 1977. The attached is a review conducted by the Quality Assurance Department of the NSC audit findings and Pullman's responses. Not all findings are addressed; those NSC findings which are not addressed in this review either stated that a program element was acceptable or only concerned insignificant, isolated discrepancies in documentation.

From this review we conclude that the NSC audit was directed primarily at the programmatic aspects and did not address itself to the verification of the adequacy of the installed hardware. The NSC audit was superficial with respect to the hardware and very critical in the review of the QA program itself. As a result, the NSC audit is considered to represent an inadequate and inaccurate measure of the overall Pullman Power Products quality program.

If you have any specific questions or need clarification of any point, please call either M. E. Lappke (69-1727) or C. L. Eldridge (3694), the QA Department personnel who performed this review.

Reviewed by
R. P. WISCHOW
W. P. Wischow

CLEldridge(3694):cn

cc: **CEMaxfield**
MRTresler
MELappke

Attachment

Criterion I

Finding 3*

The functions listed are not outside the scope of Quality Control as defined in Specification 8711. The title, "Engineering Specifications," is misleading since Engineering Specifications are actually Quality Assurance procedures. Engineering changes are reviewed only to verify compliance with Code requirements.

Quality Control personnel have performed functions which should have been performed by production personnel. Details and recommended corrective actions are outlined in Appendix A to QA audit report No. 80422.

No cases where Quality Assurance has audited its own performance were identified. Corrective action recommended in Appendix A to QA audit report No. 80422 should insure that this will not occur.

Finding 4

Responsibilities and duties of key personnel except for the Construction Superintendent were described in the manual at the time of NSC's audit. KFP-1 was revised on December 30, 1977 to include responsibilities and duties of the Construction Superintendent and to add job descriptions for each type of Quality Control Inspector. General responsibilities and duties of Quality Control Inspectors were already identified.

Finding 5

Existing position descriptions appear to meet the requirements of Specification 8711 and the 1971 Code.

Finding 6

Interface procedures for each activity listed appear to meet the requirements of Specification 8711 and the 1971 Code. No interface procedure for holding meetings is required.

Finding 7

KFP-18.3.2 requires the Field Quality Assurance Manager to send copies of internal audit reports to Corporate Quality Assurance.

Management reviews of corrective action reports, nonconformance reports, and personnel qualifications were performed and documented as Management Audits. Pullman's response was incorrect in that Management Audits on a semiannual basis are required by KFP-18, paragraph 18.2.1, revision 8/22/72.

*For exact wording of the NSC finding, the reader should consult the NSC report "Pullman Power Products Work Scope at Diablo Canyon Site", dated October 20, 1977.

Criterion I

Finding 7 (continued)

The interface between the field and the Paramount Shop is described in KFP-6, paragraph 6.5 (Rev. 8/31/77) and KFP-4, paragraphs 4.2 and 4.3.1 (Rev. 8/27/76).

Some functions performed by the corporate office at Williamsport are not controlled by the program but are performed in accordance with Corporate Procedures. Details are described in Appendix A to audit report No. 80422.

Finding 8

Interfaces appear to be adequately described as follows:

Drawing approval - KFP-4 and KFP-8.

Review of isometric, hanger, and restraint document packages - KFP-4, KFPS-7, and ESD-243 and -259, respectively.

Welders' logs - KFP-21.

Control of welding process - KFP-12 and -15.

Finding 9

No objective evidence could be found to indicate that the stop work authority of the Field Quality Assurance Organization is not adequate. ESD-240 requires a hold tag to be placed on discrepant items. Construction personnel are forbidden by the procedure to work through a hold tag. No objective evidence was found to indicate that a hold tag had been intentionally bypassed. The stop work authority described in ESD-240 appears to meet requirements of the contract and 1971 Code.

Criterion II

Finding 1

Chapter 17.1 of the Diablo Canyon Final Safety Analysis Report commits to implementing a Quality Assurance program which meets the intent of 10CFR50, Appendix B. The Pullman Quality Assurance Program commits to meeting the Quality Assurance requirements of Section III of the ASME Boiler and Pressure Vessel Code, 1971 edition. The Quality Assurance requirements of the 1971 Code were written to be consistent with the requirements of 10CFR50, Appendix B.

ANSI B45.2 states in its foreword that it does not apply to work performed in accordance with the Code.

10CFR50.55a requires that nuclear power plant piping and components be constructed and inspected in accordance with the Code.

Criterion II

Finding 1 (continued)

The documents which establish requirements for the Pullman Quality Assurance Program are PGandE Specification 8711 and the 1971 edition of the Code. ANSI N45.2 does not apply.

The program appears to meet the requirements of Specification 8711 and the 1971 Code except for the deficiencies listed in Appendix A to audit report No. 80422.

Finding 2

Revisions were made to the piping manual on December 23, 1977 to more clearly describe the program. The revisions improved the program description, but the program is still not adequately defined. See Appendix A to audit report No. 80422 for details.

Finding 3

Pullman's response appears to be accurate. However, the scope and applicability of the program do need to be more clearly defined. See Appendix A to audit report No. 80422 for details.

Finding 4

Corporate Management Audits were verified to include nonconformances, personnel qualifications, and corrective action. However, implementation of a system for reviewing nonconformances to detect trends is recommended. See Appendix A to audit report No. 80422.

Finding 7

Pullman's response appears to be correct. Procedure KFP-1 was revised on December 23, 1977 to require Quality Assurance training of all personnel involved in quality-related activities.

Finding 8

Written examinations are retained in inspector qualification files. These examinations document the inspectors' familiarity with the requirements of applicable procedures. ESD-237 is a detailed training program for Quality Assurance and Quality Control personnel.

Criterion III

Finding 1

Pullman's response appears to be accurate and appropriate.

Criterion III

Finding 3

It should be pointed out that Pullman's review is simply to verify code compliance. Reviews performed to reconcile changes with original design requirements and objectives are performed by FGandE. No violation of the 1971 Code or Specification 8711 is apparent.

Finding 4

KFP-4 appears to be detailed enough to allow effective implementation. A more detailed procedure does not appear necessary. No violation of the Code or contract is apparent.

Finding 8

ESD-253 appears to adequately cover drawing control. KFP-4, however, may not apply. See Appendix A to audit report No. 80422.

Criterion IV

Finding 3

Pullman's response appears to be correct. However, the Corporate procedure for qualifying vendors has not been officially identified as part of the program to be implemented at Diablo Canyon Power Plant. See Appendix A to audit report No. 80422.

Finding 4

Pullman's response appears to be correct.

Finding 5

Suppliers are not used unless they appear on the Qualified Vendors List. Vendor audits are controlled by Corporate procedures. See Appendix A to audit report No. 80422.

Criterion V

Finding 1

The auditors' specific words do not appear in the program. However, KFP-8, paragraph 8.2 requires that the Field Process Sheet identify "all operations and inspections and the sequence in which they occur." Procedure numbers are required to be referenced for each operation or inspection. This effectively requires activities significant to obtaining quality to be controlled by written procedures.

Criterion V

Finding 2

Hanger package review and preheating for welding are covered by procedures as explained in Pullman's response. The other activities listed do not significantly affect quality and need not be performed in accordance with written procedures.

Finding 3

The auditors state procedures are insufficiently described but do not reference requirements. With the exceptions listed in Appendix A to audit report No. 80422, the Pullman Quality Assurance Program appears to meet the requirements of Specification 8711 and the 1971 Code.

Finding 4

Procedures do appear to follow the flow of the work. KFP-8 requires that process travelers identify the sequence in which operations and inspections are to be performed. The response to Finding 3, above, is again appropriate.

Criterion VI

Findings 3 and 4

KFP-17 was revised on December 23, 1977 to control ESD procedures and Special Quality Assurance Instructions.

Finding 5

This Finding is directly contradicted by Finding 11. Finding 11 appears to be correct.

Finding 6

This Finding does not appear to be based on requirements of applicable regulations or standards. There is no apparent reason to change the established practice.

Finding 7

PGandE's drawing control procedures assure that Pullman receives the latest drawing changes. The drawings are logged-in on the Drawing Control Index and controlled in accordance with established procedures. Field Engineers are required by procedure to verify that they are using the latest revisions. Drawing control appears to be effective and no violation of applicable requirements is apparent.

Criterion VI

Finding 10

Corrective action was completed on December 30, 1977.

Criterion VII

Finding 1

See Appendix A to audit report No. 80422. The interface appears to be functioning adequately.

Criterion VIII

Finding 10

Applicable regulations and standards do not require specific procedures for these items.

Finding 12

ESD-223 appears to meet the requirements of Specification 8711 and the 1971 Code.

Criterion IX

Finding 3

Pullman's response appears to be correct. SNT-TC-1A allows a person to be certified directly as a Level II if his training and experience meets the sum of requirements for Level I and Level II. It was noted that inspectors other than NDE personnel have not always met the guidelines for prior experience established in ANSI N45.2.6. However, compliance with ANSI N45.2.6 is not required for this project. Training and indoctrination guidelines of ANSI N45.2.6 were adopted and appear to have been met.

Finding 10

Pullman's responses appear to be correct.

Findings 11, 13, 15, 17

Pullman's responses appear to be correct. No violations of the Code or Specification 8711 are apparent.

Criterion X

Finding 5

Agree with Pullman's response.

Finding 6

Agree with Pullman's response. Inspection record sheets used reference the inspection procedure and establish acceptance criteria. The inspector does not put a check mark by each acceptance criterion but signs the form saying that all acceptance criteria specified have been met. This method of performing and documenting inspections appears to meet the requirements of the contract and the 1971 Code.

Finding 8

Records indicate that the proposed review was completed. No further corrective action is required.

Criterion XI

Finding 2

KFP-8, paragraph 8.17, addresses this interface. ESD-229 describes the methods of performing hydrostatic tests. These procedures appear to meet all requirements of ANSI B31.1, ANSI B31.7, the contract, and the 1971 Boiler and Pressure Vessel Code for work performed by Pullman.

Finding 3

Agree with Pullman's response.

Finding 5

Agree with Pullman's response. In addition, it should be pointed out that all systems required to be code stamped are being hydrostatically tested in accordance with the Code and witnessed by the Authorized Inspection Agency.

Criterion XII

Finding 2

Agree with Pullman's response. Calibration system does not appear to violate contract requirements or requirements of 1971 Code.

Criterion XII

Finding 3

In addition to Pullman's response, it should be pointed out that procedures in effect since 1972 appear to meet requirements of the contract and the 1971 Code. If significant out-of-tolerance conditions had been identified, all items that could conceivably have been inspected by the device could have been reinspected.

The Code requires that measures be established to assure that measuring and test equipment used in activities affecting quality be maintained within specified accuracy limits. The findings do not indicate that instruments that were outside specified accuracy limits were used in activities affecting quality.

Finding 3(g) contradicts Finding 3(f).

Finding 3(h) has no basis in the contract or the 1971 Code.

Criterion XIII

Finding 2

Storage procedures appear to meet the requirements of the contract and ASME Boiler and Pressure Vessel Code, Section III, 1971. No corrective action necessary.

Finding 3

Procedures appear to meet the requirements of the contract and ASME Boiler and Pressure Vessel Code, 1971.

Finding 4

No procedures required.

Finding 5

Procedures appear to meet the requirements of the contract and the 1971 Code.

Finding 7

Neither the procedure nor the checklist appear to violate requirements of the contract or the 1971 Code.

Criterion XIV

Finding 1

The auditor appears to be saying that the process traveler is inadequate for indicating status since it is kept at an area inspector's station rather than at the point where work is being performed.

There is no written requirement in applicable regulations or standards for the process traveler to be attached to or adjacent to the work being performed. Hold tags and discrepancy reports are used to indicate the status when discrepant conditions exist. The traveler is available to the person directly responsible for supervising the work.

However, repair work in progress on main steam Field Weld #362 was checked and the process traveler was reviewed. It was noted that two hold points had been bypassed. Discussions between the assigned Quality Control inspector and the foreman in charge of the work indicated that the foreman had not read the process traveler. In this particular case, the traveler did not accurately reflect the status of the work and was not effectively controlling the work. See Appendix A to audit report No. 80422.

There is no basis in applicable regulations and standards for requiring the process traveler to include cleaning prior to installation of insulation, preheating, checking gas flows, or checking O₂ content in the backing gas. These are handled by established procedures.

Finding 5

Corrective action was completed by Rev. 12/30/77 of ESD-229.

Finding 6

Process sheets are available for foremen to read, but evidence indicates that they do not always read them (see Finding 1).

Finding 7

This practice has not been followed and is not required for work performed under the piping (KFP) manual (see Finding 1). KFP-8 is vaguely written and the field's interpretation is less restrictive than the wording of KFPS-7 for pipe supports. KFPS-7 does not conflict with KFP-8. It simply adds additional requirements.

Criterion XV

Finding 2

ESD-240 is a detailed procedure and appears to adequately implement Specification 8711 and 10CFR50, Appendix B requirements. The procedure does not specifically address routing to PGandE, but the D.R. form has a space for customer approval. A check of 20 completed D.R.s was performed and all were approved by PGandE. PGandE approval is required by KFP-10. Controls appear to be adequate.

Criterion XV

Finding 3

KFP-10, paragraph 10.1.4 and ESD-240, paragraph 3.3 adequately describe the interface from the Pullman side. It is PGandE's responsibility to designate PGandE personnel to perform such interface functions. NCRs are not required to be approved by PGandE. (See comment Criterion XVI, Finding 1.)

Finding 5

See comment - Criterion XVI, Finding 1.

Criterion XVI

Finding 1

The corrective action system meets the contract requirements and the 1971 requirements of the ASME Boiler and Pressure Vessel Code. A non-conformance was defined as a deficiency in a hardware item. KFP-10, KFPS-9, and ESD-240 require writing Discrepancy Reports for all deficient hardware items.

ESD-240 also requires writing a Noncompliance Report for an item or work process which deviates from a specified condition or requirement, but which can be corrected during the normal construction process. They are not considered to be permanent documents and are not presented to PGandE for review.

Deficiencies noted in internal audits are only required to be written up in narrative form in an audit report. They are not presented to PGandE for review.

Recommendation:

Expand the use of Noncompliance Reports or establish a new reporting system to cover deficiencies which are not associated with a specific item or component. Make them permanent documents and submit them to PGandE for review. Use them to document findings of internal audits as appropriate. (See comment Criterion XVIII, Finding 3.) Perform periodic reviews of DRs and NCRs to determine trends or identify areas where practices might need improving.

Note:

PGandE Specification 8711, paragraph 3.28 states "All conditions adverse to quality, the cause, and corrective action shall be documented and forwarded to the Constructor and Contractor's supervision and management for analysis, evaluation, and review." Today's accepted definition of "conditions adverse to quality" is not restricted to hardware items only.

Criterion XVI

Finding 2

Deficiencies identified on DRs and NCRs have been corrected. The recommendation in Finding 1, above, should be implemented to insure that items not required to be documented on a DR or NCR are not left uncorrected.

Finding 3

Contractors are not required to have a procedure for reporting 10CFR50.55(e) deficiencies. PGandE has that responsibility.

Pullman does have a procedure in effect for reporting deficiencies in accordance with 10CFR Part 21.

Criterion XVII

We agree with the Findings and proposed revisions.

Criterion XVIII

Finding 1

Contradicts other findings in this section by saying audit program is adequate.

Finding 2

KFP-18 references Corporate procedure XVIII-1 and states that it is being used by the corporate office. Neither procedure defines the scope of internal or Corporate audits. KFP-18, revision 12-30-77, states that its scope is to present a system of planned and periodic audits which shall be carried out to assure compliance with all aspects of the Quality Assurance Program and to determine the effectiveness of the program. However, it doesn't say whether Corporate audits, internal audits, or a combination of the two will cover all aspects of the program. A detailed audit schedule needs to be generated to assure that all aspects of the program are audited by somebody (ref. Specification 8711, section 4, paragraph 3.212).

Corporate procedure XVIII-1 or its requirements should be incorporated into the site program.

In addition, audits are to be performed in accordance with written procedures or checklists (ref. 10CFR50, Appendix B, Criterion XVIII). Checklists for internal audits have been drafted but no requirement for their use has been added to the program.

Corrective action is outlined in Appendix A to audit report No. 80422.

Criterion XVIII

Finding 3

No evidence could be found to indicate that audits were ineffectual. Deficiencies identified were corrected, and corrective action to prevent recurrence was implemented. However, deficiencies have tended to recur. For example, deficiencies in drawing control were identified in February, May, and September 1975. Deficiencies concerning the use of the Qualified Vendors List were identified in April 1975 and January and June 1976. This does not indicate that audits were ineffectual, but it may indicate a need to establish a monitoring system to identify trends so that special measures may be taken to prevent recurrence of deficiencies.

Finding 4

Management audits of the pipe support manual were, in fact, not performed prior to 1978. KFP-18 does not appear to apply to hangers. The description of the Quality Control procedures manual (KFP) in the front of the manual states that it applies to field installation of components, materials, parts, piping subassemblies and appurtenances. A similar page in the front of the pipe support manual (KFPS) says that it applies to piping supports, rupture restraints, snubbers, pipe hangers, and structural work. The applicability of program elements needs to be more clearly defined.

Finding 5

See comments to Finding 2 above.

Finding 6

KFP-18, revision 8/22/72, paragraph 18.5 and KFPS-16, revision 8/22/72, paragraph 16.5 require audit reports to be written and forwarded to the responsible supervisor and require that he institute corrective action. A follow-up audit is also required.

In addition, KFP-18 was revised on December 30, 1977 to require a response to corporate audits within 30 days of notification of violation.

Note:

No written requirement for defining such time limitation exists. Existing procedures for audit reports and responses already met 10CFR50, Appendix B and Specification 8711 requirements.

Finding 8

See Finding 3 above. Corporate procedure XV-2 does not apply to audit findings.

Finding 9

See Finding 2 above. In addition, KFP-18, revision 12/30/77, paragraph 18.7.1 requires periodic independent audits of the Director of Quality Assurance by personnel not associated with Quality Assurance function. The word "periodic" should be defined.

NONCONFORMANCE REPORT

Page 1 of 2

ASME
Quality Assurance
76-286 Rev. 12/77

IDENTIFICATION:

Plant/Site
D C O

Year
7 8

Rev. Desl
R M

Number
0 0 4

TO BE COMPLETED BY INITIATOR

Reference Specification 8711
Item or Activity (A) Quality Assurance Program and (B) Audit Plan
Description See pages 2 and 3.

RSB RECEIVED
CKM MANAGER'S OFFICE
JRM
BPJ NOV 22 1978
P IN
MRT STATION CONST. DEPARTMENT FILE
COPY (S)

Suggested Resolution (optional)

5 ORIGINATED: Department G. C. Mechanical Date 6/15/78 By R.D. Etler
TO BE COMPLETED BY TECHNICAL REVIEW GROUP

Distribute Information
Copies - SEE 11 Below

6 Cause of Nonconformance See page 3.

RECEIVED JCS
SUPERINTENDENT'S RUE
PTM
CTT
MRT

Resolution See pages 3 and 4

Reportable in NRC? YES

Corrective Action to Prevent Recurrence

Implementation of the resolution will prevent recurrence

Grants
Chairman Richard D. Etler
Quality Assurance
Other
Representation

COPY
Date 10/3/78
Date 10/3/78
Date 10/3/78
Corrective Action Date 10/20/78

8 SCHEDULED COMPLETION Resolution Date 10/20/78
TO BE COMPLETED BY IMPLEMENTING ORGANIZATION

Date 11/13/78

Date 1/1

Date 11/13/78

Date 1/1

TO BE COMPLETED BY QUALITY ASSURANCE

10 VERIFICATION:

The Resolution and Corrective Action are complete

DISTRIBUTION (Other Departments to receive information copy when original - check below)

- ☒ Authorized Inspector (for ASME items)
- ☐ Steam Generation
- ☐ Engineering
- ☒ Station Construction R.D. Etler / R.D. Etler
- ☐ Plant Superintendent
- ☐ Engineering Research
- ☐ Quality Assurance
- ☐ Safety Health and Claims
- ☐ Security
- ☐ Materials
- ☒ Contractor Pullman Power Product
- ☐ Other

☐ Additional Sheets Attached

NONCONFORMANCE REPORT

Page 2 of 4

DCO - 78 - RM - 004

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Description:

- (A) The Pullman Power Products Quality Assurance Program is not adequately defined. The ASME Boiler and Pressure Vessel Code, Section III, paragraph MA4140 of the 1971 edition requires that the Quality Assurance Program be documented in detail in a manual consisting of written policies, procedures, and instructions. Corporate procedure No. XVIII-1 is presently being used for the performance of management audits of field activities. Corporate procedure No. VII-1 is being used for qualifying vendors for the Approved Vendors List. These procedures implement Quality Assurance requirements of the contract, but are not identified as part of the program and revisions are not controlled by the program.

The program is required to be approved by the ASME, and changes to the manual are to be approved by the Authorized Inspection Agency. KFP-1, paragraph 1.13 states that Engineering Specifications (ESDs) shall be part of the program. Most ESDs appear to be implementing procedures, but some define actual program elements. For example, ESD-240 establishes the Noncompliance Report (NCR) system. No evidence could be found to indicate that ESD-240 has been reviewed and approved by the ASME or the Authorized Inspection Agency.

It is not clear which manuals and procedures are applicable to specific activities. The pipe support manual is considered by site personnel as a supplement to the piping manual. The piping manual is approved by Pullman's Vice President but the support manual is only approved by the field QA Manager. However, the front page of each manual indicates that it establishes the quality requirements for work performed under that manual. The defined scope of each manual indicates that they apply to different construction activities.

Engineering Specifications appear to supplement one or both manuals or independently establish quality assurance program requirements.

- (B) P G and E Specification 8711 and the 1971 Code, Section III, paragraph MA4700 require a comprehensive system of planned and periodic audits to be carried out to assure compliance with all aspects of the Quality Assurance Program.

Procedure KFP-18 states in its scope that it establishes such a system. However, two types of audits, management audits and internal audits, are described. The procedure does not establish the scope of either type of audit and no detailed schedule has been developed to show that all aspects of the program are being audited. Furthermore, audit records at the site do not indicate

DCO - 78 - RM - 004

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Description (continued):

(B) (continued)

that all aspects of the program are being audited. Records do not indicate that management audits have been performed on pipe support work. An unofficial, unapproved internal audit schedule exists, but it has not been followed consistently and few ESOs appear on the schedule. A March 1977 internal audit erroneously states that KFP-3, -5, -9, and -14 are not to be audited as they do not apply to Diablo Canyon. Internal audits scheduled for October, November, and December, 1978 and January 1979 were not performed.

6 CAUSE OF NONCONFORMANCE

Since the beginning of the contractor's installation work at Diablo Canyon there have been changes to the scope of Class I work. These changes have been required by P G and E and in some cases final quality requirements were not set at the time of the change in scope. Most changes involved work not under ASME jurisdiction. The contractor's quality assurance manual was written primarily to be in accordance with ASME Code work. The manual was approved by ASME originally and has since been reviewed and reapproved. Plant design additions and increased quality requirements have been handled under separate supplementary procedures. The additions and increased quality requirements caused the quality programs to develop such that organization and control was cumbersome and difficult to clearly define.

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Resolution:

- (A) Write a program description which clearly identifies the documents that are to be considered part of the total quality assurance program and establish the hierarchy of the documents (where necessary obtain approval by the proper authority).

Define approval requirements for the above documents and for revisions and obtain approvals where necessary.

Clearly define the scope of work to which the above documents are applicable.

Review the program to insure that supplementary procedures do not include requirements which conflict with requirements of the procedures they supplement. Several KFP procedures require the involvement of the AI. Corresponding KFPS procedures allow work to be done without AI involvement. KFPS procedures clearly

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DISPOSITION

Resolution (continued):

- (A) (continued)
cannot supplement KFP procedures without revising the KFP procedures to allow waiving AI involvement on non-code work. (Example: KFP-7 and KFPS-6).
- (B) Establish and implement a detailed audit schedule to assure compliance with Specification 8711 and the Code.

INFORMATION COPY

NONCONFORMANCE REPORT

Page 3 of 2

Quality Assurance
78-218 Rev. 12/77

IDENTIFICATION:

Plant/Site
0 C 0Year
7 8Resp. Dept.
R MNumber
0 0 5

TO BE COMPLETED BY INITIATOR

Reference
Requirement(s)

Independence of Quality Control Personnel from Production

RSB

RECEIVED

CKM

MANAGER

JRM

OFFICE

BPJ

OCT - 5/8/78

P.L.N.

STATION CONST.

MRT

DEPARTMENT

COPY (S)

Description

See page 2.

Suggested Resolution
(optional)

5 ORIGINATED: Department G. C. Mechanical

Date 6/15/78

By R. D. Taylor

Distribution Information
Copies - SEE 11 Below

TO BE COMPLETED BY TECHNICAL REVIEW GROUP

6 Cause of Nonconformance

Resolution See page 2.

INFORMATION COPY

Reportable to NRC?

☐ YES☐ NO☐ Review Group to Determine

Date 1 / 1

Corrective Action to Prevent Recurrence

Same as resolution and contractor to audit functioning
of the new ESO. NOTE: ESO-264 issued 7/10/78.Group
Chairman
Quality
Assurance
Other
Representative

R. D. Taylor

J. P. Taylor

J. P. Taylor

Date

9-15-78

Date

9-15-78

Date

9/15/78

Corrective
Action Date

8 SCHEDULED COMPLETION

Resolution Date

TO BE COMPLETED BY IMPLEMENTING ORGANIZATION

Resolution Completed

Approved
By

R. D. Taylor

Date

9/15/78

Inspection (if required)

By

Date

1 / 1

Corrective Action Completed

Approved
By

R. D. Taylor

Date

9/15/78

Inspection (if required)

Approved
By

Date

1 / 1

Remarks

TO BE COMPLETED BY QUALITY ASSURANCE

TO VERIFICATION:

The Resolution and Corrective Action are complete.

M. P. Taylor

9/22/78

DISTRIBUTION (Other Departments to receive information copy when originated - check below)

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- ☒ Station Construction

- ☐ Plant Superintendent
- ☐ Engineering Research
- ☒ Quality Assurance
- ☐ Safety Health and Claims

- ☐ Security
- ☐ Materials
- ☒ Contractor Ballou's Power Products
- ☐ Other

☐ Additional Sheets Attached

DCO - 78 - RM - 005

N Description: P G and E Specification 8711, Section 4, paragraph 3.11
O requires that Quality Control personnel perform only quality control
N functions and that they be free of scheduling and production pressures.

C
O A review of procedures and work in progress indicates that Quality
N Control inspectors' independence from scheduling and production
F pressures is not assured by the program as written. Procedures
O do not clearly indicate that it is the Production Department's
R responsibility to read and use the process sheet insuring that
M steps are performed in the required sequence and hold points are
A observed.

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6 Cause of Nonconformance

Responsibilities of production personnel were not specifically defined
in writing nor consistently understood.

D Resolution: Contractor to issue an "ESD" to clearly define responsibilities
I of production and Quality Control personnel and to provide instruction so
S that personnel understand the policy.

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INFORMATION COPY

MINOR VARIATION REPORT

SUPERSEDED BY REV. 1

IDENTIFICATION:	Plant Diablo Canyon	Unit No. 2	Reference Spec. No. 8711	Page 1 of 1
Contractor / Supplier	Pullman Power Products		Discrepancy Report No. See attachments.	PG&E MVR No. A-3725
Send copy to Contractor	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Name Pullman Power Products		

DESCRIPTION OF DISCREPANCY

Item Various Unit 2 Pipe Supports per attached D.R.'s.
Explanation PG&E Q.A. Department performed an evaluation of the Pullman Power Products corporate audit of the Unit 2 hardware installed by Pullman Power Products corporation. Fifty-nine (59) installations were inspected by PG&E Q.A. and twenty-six (26) were accepted. Of the thirty-three installations found unacceptable by Q.A. twenty were accepted by G.C. Field Engineers using various criteria established by PG&E Engineering. The remaining thirteen (13) discrepant supports will be repaired.

Field Engineer /
Inspector C. Bral Date 6/12/78
DISPOSITION Reject. Repair the discrepant pipe support installations per the attached Pullman Power Products D.R.'s #3624, 3625, 3631, 3640, 3641, 3642, 3635. A few pipe supports found discrepant by PG&E Q.A. and G.C. Field Engineers will be corrected without the requirement for a Pullman D.R. or PG&E MVR, but as normal course of work.

Additional concurrence, when required	Name N/A	Date
Resident Engineer R.D. Ely	Date 6/19/78	
REVIEW This Minor Variation Report.	(1) <input checked="" type="checkbox"/> Is Not Reportable <input type="checkbox"/> May be Reportable (per Title 10CFR Part 21)	
	(2) <input checked="" type="checkbox"/> Is Not a Nonconformance as Defined in Procedure PRM-3	
	Coordinating QC Engineer J. [Signature]	Date 6/26/78
Resident Engineer R.D. Ely	Date 6/19/78	

DISPOSITION ACCOMPLISHED

Remarks

Coordinating QC
Engineer
Field Engineer /
Inspector

Date

Date

ATTACHMENTS

- 1) Telecon w/CHL1, 2-14-78, 0815 hrs.
 - 2) Telecon w/HCKlyce, 2-15-78,
 - 3) Telecon 2/CHL1, 6/19/78
 - 4) PPP D.R.'S 3635, 3624, 3641, 3642.
- Not attached.

IDENTIFICATION:	Plant Diablo Canyon	Unit No. 2	Reference Spec No. 8711	Page 1 of 2
Contractor / Supplier	Pullman Power Products		Discrepancy Report No. attachments	PG-E MVR No. M-3725 R-1
Send copy to Contractor	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Name Pullman Power Products		

DESCRIPTION OF DISCREPANCY	
Item	Various Unit 2 Pipe Supports per attached D.R.'s.
Explanation	See page 2.

Field Engineer / Inspector	<i>Russell S. Beed</i>	Date	10/11/78
-------------------------------	------------------------	------	----------

DISPOSITION Rect. Repair the discrepant pipe support installations per the attached Pullman Power Products D.R.'s #3624, 3625, 3631, 3640, 3641, 3642, 3635 R-1. A few pipe supports found discrepant by P G and E QA and G.C. Field Engineers will be corrected without the requirement for a Pullman D.R. or P G and E MVR, but as normal course of work.

Additional concurrence, when required	Name N/A	Date	
---------------------------------------	-------------	------	--

Resident Engineer	<i>V. L. Kilpatrick</i>	Date	10/11/78
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REVIEW This Minor Variation Report. (1) ☒ Is Not Reportable; ☐ May be Reportable (per Title 10CFR Part 21)
(2) ☒ Is Not a Nonconformance as Defined in Procedure PRM-3

Coordinating QC Engineer	<i>J. L. Beed</i>	Date	10/20/78
Resident Engineer	<i>V. L. Kilpatrick</i>	Date	10/11/78

DISPOSITION ACCOMPLISHED

Remarks

Coordinating QC Engineer		Date	
Field Engineer / Inspector		Date	

ATTACHMENTS 4) PPP DR's 3635 R-1, 3624, 3625, 3631, 3640, 3641, 3642. Not attached

MINOR VARIATION REPORT

M-3725 R-1

EXPLANATION: PG&E Q.A. Department performed an evaluation of the Pullman Power Products corporate audit of the Unit 2 hardware installed by Pullman Power Products corporation. Fifty-nine (59) installations were inspected by PG&E Q.A. and twenty-six (26) were accepted. Of the thirty-three (33) installations found unacceptable by Q.A. twenty (20) were accepted by G.C. Field Engineers using various criteria established by PG&E Engineering. The remaining thirteen (13) discrepant supports will be repaired.

REV. 1: Revised to correct hanger number as shown on DR 3635 Rev. 1.

MINOR VARIATION REPORT

IDENTIFICATION:	Plant: <u>Diablo Canyon</u>	Unit No.: <u>1 & 2</u>	Reference Spec No.: <u>8711</u>	Page: <u>1 of 2</u>
Contractor / Supplier:	<u>Pullman Power Products</u>		Discrepancy Report No.: <u>SEE ATTACHMENTS</u>	PGQA# MVR No.: <u>4-3895 R-2</u>
Said copy to Contractor:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Name: <u>Pullman Power Products</u>		

DESCRIPTION OF DISCREPANCY	
Item:	<u>Various Unit 1 & 2 Pipe Supports per attached D.R.'s.</u>
Explanation:	<u>See page 2.</u>

Field Engineer / Inspector:	<u>Russell S. Breed</u>	Date:	<u>4/18/79</u>
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DISPOSITION:	<u>Reject. Repair the discrepant pipe support installations per the attached Pullman Power Products D.R.'s #3624, 3625, 3631, 3640, 3641, 3642, 3635 R-1. A few pipe supports found discrepant by P G and E QA and G.C. Field Engineers will be corrected without the requirement for a Pullman D.R. or P G and E MVR, but as normal course of work.</u>
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Additional concurrence, when required:	Name: <u>N/A</u>	Date:	
Resident Engineer:	<u>V. L. Kilpatrick</u>	Date:	<u>5/2/79</u>

REVIEW	This Minor Variation Report:	(1) <input checked="" type="checkbox"/> Is Not Reportable; <input type="checkbox"/> May be Reportable (per Title 10CFR Part 21)
		(2) <input checked="" type="checkbox"/> Is Not a Nonconformance as Defined in Procedures PRM-3
	Coordinating QC Engineer:	<u>J. Angelo</u> Date: <u>5/4/79</u>
	President Engineer:	<u>V. L. Kilpatrick</u> Date: <u>5/2/79</u>

DISPOSITION ACCOMPLISHED

Remarks:	<u>Hangers noted on D.R.'s #3624, 3625, 3631, 3640, 3641 & 3642 have been repaired, inspected and accepted by Pullman Power Products in accordance with the respective discrepancy reports.</u>
	<u>Hangers listed in D.R. 3635 under items 1 thru 4 have been processed per the approved disposition. Pullman Power Products conducted a T-shoe audit per DR 3635 item 5 and reworked as necessary Unit 1 installations. DR 3911 (ref. MVR M-3895) has been established to continue the T-shoe audit and rework program for Unit 2.</u>

Coordinating QC Engineer:	<u>J. Angelo</u>	Date:	<u>5/9/79</u>
Field Engineer / Inspector:	<u>Russell S. Breed</u>	Date:	<u>5/2/79</u>

ATTACHMENTS:	<u>1) PPP DR's 3635 R-2, 3624, 3625, 3631, 3640, 3641, 3642.</u>
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MINOR VARIATION REPORT

Page 2

M-3725 R-2

Explanation: P G and E QA Department performed an evaluation of the Puliman Power Products corporate audit of the Unit 2 hardware installed by Puliman Power Products corporation. Fifty-nine (59) installations were inspected by P G and E QA and twenty-six (26) were accepted. Of the thirty-three (33) installations found unacceptable by QA twenty (20) were accepted by G.C. Field Engineers using various criteria established by P G and E Engineering. The remaining thirteen (13) discrepant supports will be repaired.

Rev. 1: Revised to correct hanger number as shown on DR 3635 Rev. 1.

Rev. 2: Revised to note that the discrepant supports were in both Unit 1 & 2, and include revision to DR 3635.

MINOR VARIATION REPORT

IDENTIFICATION:	Plant: <u>Diablo Canyon</u>	Unit No.: <u>1 & 2</u>	Reference Spec No.: <u>8711</u>	Page: <u>1 of 1</u>
Contractor / Supplier:	<u>Pullman Power Products</u>		Discrepancy Report No.: <u>N/A</u>	PCWE NVR No.: <u>78-3723</u>
Send copy to Contractor:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Name: <u>N/A</u>		

DESCRIPTION OF DISCREPANCY

Item: Frequency of audits performed by Pullman Power Products corporate Q.A. staff.
 Explanation: The Pullman Power Products QA procedure KFP-18 states that all aspects of the PPP QA program will be audited every 6 months however, the PPP Corporate Audit Procedure XVIII-1 states that the QA Program will be audited annually.

Field Engineer / Inspector: R. W. Taylor Date: 6/12/78

DISPOSITION: Agree on an audit frequency and revise Pullman Power Products QA Field Audit Procedure KFP-18 or the Pullman Power Products Corporate Audit procedure XVIII-1 accordingly.

Additional concurrence, when required: Name: N/A

Resident Engineer: R. W. Taylor Date: 6/14/78

REVIEW: This Minor Variation Report.
 (1) ☒ Is Not Reportable; ☐ May be Reportable (per Title 10CFR Part 211)
 (2) ☒ Is Not a Nonconformance as Defined in Procedure PRM-3
 Coordinating QC Engineer: J. J. [Signature] Date: 6/14/78
 Resident Engineer: R. W. Taylor Date: 6/14/78

DISPOSITION ACCOMPLISHED

Remarks: The Pullman Power Products Quality Assurance procedure KFP-18 was revised 8/18/78 and requires that all aspects of the Pullman Power Products Quality Assurance Program be audited annually.

Coordinating QC Engineer: J. J. [Signature] Date: 1/17/79
 Field Engineer / Inspector: S. C. [Signature] Date: 1/11/79

☐ ATTACHMENTS

MINOR VARIATION REPORT

IDENTIFICATION:	Plant: Diablo Canyon	Unit No.: 2	Reference Spec No.: 8711	Page: 1 of 1
Contractor / Supplier:	Pullman Power Products		Discrepancy Report No.: N/A	PG&E NVR No.: N-3724
Send copy to Contractor:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Name: N/A		

DESCRIPTION OF DISCREPANCY

Item: Field Weld No. 362.

Explanation: Inspection point was bypassed as described on attached PPP NCR #265.
Reference P G and E QA Audit #80422.

Field Engineer / Inspector: *Tom Blanche* Date: 6/12/78

DISPOSITION: Reject. Substitute radiograph inspection for penetrant inspection missed and create a new ESD per the "Recommended Corrective Action" on attached PPP NCR #265.

Additional concurrence, when required: Name: N/A Date:

Resident Engineer: *V.L. Killpack* Date: 9/21/78

REVIEW: This Minor Variation Report, (1) ☒ Is Not Reportable; ☐ May be Reportable (per Title 10CFR Part 21)
(2) ☒ Is Not a Nonconformance as Defined in Procedure PRM-3

Coordinating QC Engineer: *J. Arnold* Date: 9/26/78

Resident Engineer: *V.L. Killpack / CB* Date: 9/21/78

DISPOSITION ACCOMPLISHED

Remarks: Radiographic inspection was made and new ESD #264 was implemented per above disposition.

Coordinating QC Engineer: *J. Arnold* Date: 10/2/78

Field Engineer / Inspector: *Tom Blanche* Date: 9/21/78

ATTACHMENTS 1) PPP NCR #265.

REPORT NO. 265

DATE 5/2/78

- ☒ PROJECT MANAGER
- ☒ PIPING SUPTS.
- ☒ CHIEF ENGINEER
- ☒ PIPE SHOP ENGINEER
- ☒ HANGER ENGINEER
- ☒ WELDING SUPERINTENDENT
- ☒ LEAD ENGINEER
- ☒ AUTHORIZED INSPECTOR

COMPLIANCE:

During repair of FW-362 on Iso 501014 the hold point, established by P.P.P. Q.A. and the A.H.I., on a liquid penetrant examination of the repair area grind-out was not observed in violation of: ESD-221, Paragraph 1.3.2; ESD-221, Paragraph 5.1; and specifically KFP-8, Paragraph 8.4.

A.E. Gurst
Q.A. DEPARTMENT

COMMENDED CORRECTIVE ACTION:

1. Construction Superintendent to notify all production personnel that it is their responsibility to follow the sequence indicated on the furnished process sheet.
2. Construction Superintendent to inform all production personnel that fabrication or erection shall not proceed beyond any hold point until the designated inspection has been made & signed off by the indicated field Q.A. inspectors & the A.H.I.
3. As agreed by the Q.A. Manager & the A.H.I., radiographic inspection shall be substituted for the penetrant inspection missed hold point.
4. See reverse side.

Donald R. Bisher
Q.A. MANAGER

CORRECTIVE ACTION
REQUIRED BY: H. BAILES

☐ NOT REQUIRED

☐ CONTINUOUS
SURVEILLANCE

STEPS TAKEN TO PREVENT RECURRENCE

*P.A. inspectors failed to notify workman of hold points.
Present procedures should prevent recurrence.*

H. Bailes

CORRECTIVE ACTION APPROVED BY: A. H. Bisher

DATE: 7-12-78

4. The Chief Engineer in concert with the Q.A. Manager shall develop, publish, and implement a specific ESO concerning Field Process Sheets; planning and control indicating responsibility for initiating, issue, possession, functional use, documentation, notification of hold points, and retention as a historical record.

D. R. Bucke
5-3-78

MINOR VARIATION REPORT

REVIEWED BY: REV. 1/78

IDENTIFICATION:	Plant: <u>Diablo Canyon</u>	Unit No.: <u>2</u>	Reference Spec No.: <u>8711</u>	Page: <u>1 of 2</u>
Contractor / Supplier:	<u>Pullman Power Products</u>		Discrepancy Report No.: <u>N/A</u>	PGW-E Rev. No.: <u>R-3726</u>
Send copy to Contractor:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Name: <u>N/A</u>	

DESCRIPTION OF DISCREPANCY

Item:	<u>Piping and Associated Isometric Documentation Packages.</u>
Explanation:	<u>See page 2.</u>

Field Engineer / Inspector:	<u>Tom Black</u>	Date:	<u>6/12/78</u>
DISPOSITION:	<u>Reject. See page 2.</u>		

Additional concurrence, when required:	Name: <u>N/A</u>	Date:	
Resident Engineer:	<u>V.L. Kilpack</u>	Date:	<u>9/21/78</u>

(1) ☒ Is Not Reportable; ☐ May be Reportable (per Title 10CFR Part 21)
(2) ☒ Is Not a Nonconformance as Defined in Procedure PRM-3

Coordinating QC Engineer:	<u>J. Arnold</u>	Date:	<u>9/26/78</u>
Resident Engineer:	<u>V.L. Kilpack / CB</u>	Date:	<u>9/21/78</u>

DISPOSITION ACCOMPLISHED

Remarks: All changes have been made to correct Iso's and documentation per the above disposition.

Coordinating QC Engineer:	<u>Jerry Arnold</u>	Date:	<u>10/19/78</u>
Field Engineer / Inspector:	<u>Tom Black</u>	Date:	<u>10/17/78</u>

☐ ATTACHMENTS

MINOR VARIATION REPORT

Page 2 of 2

M-3726

Explanation: The following discrepancies were found on Pullman Power Products Isometric Drawings during P G and E QA Audit #80422.

Support or Isometric	Description of Discrepancy
2-3-18	ISO shows check valve as Spec 8729 Item 17 (Velan). Installed valve is Spec 2550 (Weston Hyd.)
2-3-19	Same as 2-3-18
2-4-418	Line 1058; dimension shown as 2' is 1'-8".
2-9-478	F.W. 858 is etched on two welds
2-12-5	F.W. 170 is stamped 176
2-14-14	Detail for PX263 refers to pump 2-1, should be 2-3.
2-3-418	F.W. 1390, 1391, & 1392 are shown by the process sheet to have been performed using stainless steel 309 rod. Joints are all carbon to carbon. Note: Documentation was determined to be incorrect. The correct rod was verified to have been used.

Disposition:

ISO	Disposition
2-3-18	Change iso to reflect as-built condition.
2-3-19	Change iso to reflect as-built condition.
2-4-418	Dimension is within allowable 6" tolerance.
2-9-478	Field weld is correctly marked. Number was misread by auditor.
2-12-5	Same as 2-9-478.
2-14-14	Change iso to indicate pump 2-3.
2-3-418	Correct documentation to indicate correct weld rod.

MINOR VARIATION REPORT

IDENTIFICATION:	Plant Diablo Canyon	Unit No. 2	Reference Spec No. 8711	Page 1 of 2
Contractor / Supplier	Pullman Power Products		Discrepancy Report No. 3651	PG&E MVR No. M-3726 (1)
Send copy to Contractor	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Name N/A		

DESCRIPTION OF DISCREPANCY

Item	Piping and Associated Isometric Documentation Packages.
Explanation	See page 2.

Field Engineer / Inspector	<i>Tom Black</i>	Date	11/22/78
DISPOSITION	Reject. See page 2.		

Additional concurrence, when required	Name N/A	Date	
Resident Engineer	<i>V. L. Kilgus</i>	Date	11/22/78
REVIEW	(1) <input checked="" type="checkbox"/> Is Not Reportable; <input type="checkbox"/> May be Reportable (per Title 10CFR 2.1)		
	(2) <input checked="" type="checkbox"/> Is Not a Nonconformance as Defined in Procedure PRM-3		
	Coordinating OC Engineer	<i>J. L. Anderson</i>	Date 12/28/78
Resident Engineer	<i>V. L. Kilgus</i>	Date	11/22/78

DISPOSITION ACCOMPLISHED

Remarks: All changes have been made to correct iso's and documentation per the above disposition.

REV. 1: When this MVR number was originally taken, no PPP DR number was entered in the log. Therefore, the existence of the DR was not known when this MVR was written and when it was closed. Upon receipt of the closed DR, it was realized that this MVR was inadvertently closed before the DR had been closed.

Coordinating OC Engineer	<i>J. L. Anderson</i>	Date	12/8/78
Field Engineer / Inspector	<i>Tom Black</i>	Date	11/22/78
ATTACHMENTS	1) PPP DR #3651.		

MINOR VARIATION REPORT

Page 2 of 2

M-3726 R-1

Explanation: The following discrepancies were found on Pullman Power Products Isometric Drawings during P G and E QA Audit #80422.

Support or Isometric	Description of Discrepancy
2-3-18	ISO shows check valve as Spec 8729 Item 17 (Velan). Installed valve is Spec 2550 (Weston Hyd.)
2-3-19	Same as 2-3-18
2-4-418	Line 1058; dimension shown as 2' is 1'-8".
2-9-478	F.W. 858 is etched on two welds
2-12-5	F.W. 170 is stamped 176
2-14-14	Detail for PX263 refers to pump 2-1; should be 2-3.
2-3-418	F.W. 1390, 1391, & 1392 are shown by the process sheet to have been performed using stainless steel 309 rod. Joints are all carbon to carbon. Note: Documentation was determined to be incorrect. The correct rod was verified to have been used.

Disposition:

ISO	Disposition
2-3-18	Change iso to reflect as-built condition.
2-3-19	Change iso to reflect as-built condition.
2-4-418	Dimension is within allowable 6" tolerance.
2-9-478	Field weld is correctly marked. Number was misread by auditor.
2-12-5	Same as 2-9-478.
2-14-14	Change iso to indicate pump 2-3.
2-3-418	Correct documentation to indicate correct weld rod.

THE M.W. KELLOGG COMPANY

A DIVISION OF FULLMAN INCORPORATED

DISCREPANCY REPORT

Q.A. NO. 3696
 ISO. NO. 2-3-118
 UNIT NO. 8
 CODE NO. 8/A

CUSTOMER: Pacific Gas & Electric SPEC. NO. 8711 DATE: June 5, 1978
 PROJECT: Diablo Canyon JOB NO. 777 INSPECTOR: Bunyan/Guest

DISCREPANT ITEM: Documentation Package for Field Welds 1390, 1391, and 1392

EXPLANATION OF DISCREPANCY: During a P. G. & E. audit, it was noted that the three ~~stated~~ ^{enclosed} welds were documented as being installed using weld code 150. This procedure is used for welding P8 to P1 materials. The materials involved are P1 only. Investigation by P.P.P. personnel revealed that the original weld rod requisition and process sheet did indicate weld code 150. The Q.A. Field Inspector did not allow this procedure to be used and the weld procedure was changed to weld code 203. A second weld rod requisition was prepared. The Q.C. copy of the original weld rod requisition, which was in error and should have been voided, was filed in the isometric package. The Q.C. copy of the second weld rod requisition, which was correct and should have been filed, cannot be found. Verification of weld procedure used, correct weld code and weld rod used was determined by review of the Q.A. Field Inspector's Daily Worksheet, Warehouse copy of the weld rod requisition and magnetic sample of the installed welds. This discrepancy occurred because the field work was accomplished without a revised isometric, the Q.A. Field Inspector did not correct all pertinent documents and the Q.A. Auditors matched weld rod requisitions to an inaccurate process sheet rather than a revised isometric.

RECOMMENDED DISPOSITION:

1. Correct the weld code entry on the process sheet from 150 to 203.
2. Replace the inaccurate Q.C. copy weld rod requisition with the accurate Warehouse copy.
3. As-Build the isometric to reflect all welds and weld codes. (see DR 3696 for Ref.)

RLT
 11-17-78

Approved By: M.W.K. Field Q.A. Mgr. D.P. Burke Date 6-5-78 Customer R.P. Kelly Date 6/6/78

FINAL DISPOSITION: ☒ In Accordance With Above ☐ Other (explanation and approval required)
 Work Completed Insp: RLT Date: 11-17-78 Work Completed Insp: _____ Date: _____

EXPLANATION (IF NECESSARY):

M.W.K. Field Q.A. Manager _____ Date _____ Customer V.L. Killgus Date 4/2/78

STEPS TO PREVENT RECURRENCE ☐ Not Applicable In addition to current procedures, a new ESD, being formulated at this time, shall be adequate to eliminate this type problem. The key element in the ESD is to develop a field process sheet from the original source document and to insure that work is not performed without a revised isometric.

Field Q.A. Manager D.P. Burke 6-5-78

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

ATTACH SKETCH IF NECESSARY

JUL 26 1978

Docket Nos. 50-275
50-323

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

Attention: Mr. Philip A. Crane, Jr.
Assistant General Counsel

Gentlemen:

Subject: NRC Inspection at Diablo Canyon Unit Nos. 1 and 2

This refers to the inspection conducted by Messrs. D. F. Kirsch, T. W. Hutson and G. Hernandez of this office on July 10-13, 1978 of activities authorized by NRC Construction Permits No. CPPR-39 and CPPR-69, and to the discussion of our findings held by Mr. Kirsch with Mr. M. R. Tressler 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 inspectors.

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

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you submit a written application to

OFFICE	RV <i>gls</i>	<i>YH</i>	<i>glt</i>	<i>gls</i>		
SURNAME	Kirsch/db	Hutson	Hernandez	Spencer		
DATE	7/26/78	7/26/78	7/26/78	7/26/78		

JUL 26 1978

this office, within 30 days of the date of this letter, requesting that such information be withheld from public disclosure. The application must include a full statement of the reasons why it is claimed that the information is proprietary. The application should be prepared so that any proprietary information identified is contained in an enclosure to the application, since the application without the enclosure will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

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

Sincerely,

ORIGINAL SIGNED BY
G. S. SPENCER

G. S. Spencer, Chief
Reactor Construction and
Engineering Support Branch

Enclosure:
IE Inspection Report
Nos. 50-275/78-10
and 50-323/78-10

cc w/o encl:
R. P. Wischow, PG&E
J. D. Worthington, PG&E

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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-275/78-10
50-323/78-10

Docket No. 50-275 License No. CPPR-39 Safeguards Group _____
50-323 CPPR-69

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

Facility Name: Diablo Canyon Units No. 1 and 2

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

Inspection Conducted: July 10-13, 1978

Inspectors: [Signature] for July 25, 1978
D. F. Kirsch, Reactor Inspector Date Signed

[Signature] July 25, 1978
T. W. Hutson, Reactor Inspector Date Signed

[Signature] July 25, 1978
G. Hernandez, Reactor Inspector Date Signed

Approved By: [Signature] 7/26/78
G. S. Spencer, Chief, Reactor Construction Date Signed
and Engineering Support Branch

Summary:

Inspection on July 10-13, 1978 (Report Nos. 50-275/78-10 and 50-323/78-10).

Areas Inspected: Unannounced inspection of seismic modification activities involving: structural steel welding procedures, work observation and record review, reinforcing steel welding procedures, work observation and record review, welding electrode control, structural steel bolting, procedures, work observation and record review, ultrasonic equipment calibration and examination of structural steel welds, electrical and instrumentation raceway supports and circuit separation, structural concrete work observation and record review, 10 CFR 50.55(e) followup, and licensee QA audits and nonconformance report review. The inspection involved 75 manhours by three NRC inspectors.

Results: Of the eleven areas inspected, no items of noncompliance or deviations were noted.

DETAILS

1. Individuals Contacted

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

- *M. R. Tressler, Project Superintendent
- *C. K. Maxfield, Station Construction Superintendent
- *R. P. Wischow, Director, Quality Assurance
- *D. A. Rockwell, Resident Electrical Engineer
- *R. D. Etzler, Resident Mechanical Engineer
- *V. L. Killpack, QA Engineer
- *M. E. Leppke, QA Supervisor
- *L. G. Rasmussen, General Construction Supervisor
- *J. Arnold, Coordinating QC Engineer
- J. N. Cochran, Resident Civil Engineer
- B. Gragg, Welding Inspector
- R. Breed, QC Engineer
- F. M. Russel, Civil Engineer

b. Guy F. Atkinson Co. (GFA)

- M. M. Walsh, QA Manager
- T. Loomis, QA Engineer
- D. Haffey, QA, Weld Rod Control
- A. Kridle, Structural Steel Inspector
- K. Brainard, Concrete and Reinforcing Steel Inspector
- M. E. Chevalier, Welding Inspector
- B. Vines, General Foreman
- B. Driver, Foreman
- R. L. White, Batch Plant Operator
- M. Anderson, Lead Inspector

c. H. P. Foley Co. (Foley)

- V. Tennyson, QA Manager

d. Endurance Metal Products Co. (EMPCO)

- D. J. Gragg, QC Manager

e. Pullman-Kellogg (Kellogg)

- J. P. Runyon, QA Manager
- V. J. Casey, NDE Level II Examiner

*Denotes those present at the exit interview.

2. Licensee Action on Previously Identified Open Items

a. (Closed) On-site Approval of Open Items Identified by Licensee QA Audits (50-275 and 50-323/78-09).

The licensee had revised Quality Assurance Department Procedure No. 16.1 (Open Items) to allow the QA Director to assign certain personnel the authority and responsibility for approval of open item classification and corrective action. The QA Director had assigned this function to the onsite QA Supervisor by letter dated June 20, 1978. The Open Item log and recently identified open item reports were examined. It was noted that the onsite QA Supervisor had been approving the open items and that the approvals and resolutions were being made in a timely manner. This item is closed.

b. (Closed) Structural Steel Erection (50-275/78-05)

The plug welding of unused bolt holes was stopped by PG&E QA when it was observed that the welding procedure had not been qualified in accordance with AWS D1.1-1975. The contractor performing the welding has received a reply from the AWS in regard to the question of procedure qualification for plug welding of the unused bolt holes. The reply received stated that the procedure used in the plugging was considered as prequalified. Based on the reply from AWS and review of the completed work, this item is closed.

c. (Closed) Cracking of Concrete Buttresses (50-275 and 50-323/78-09).

The licensee has evaluated the cracking of the Buttress walls and has attributed the cracking to shrinkage caused by the bottom section of the wall being restrained and the top section being free to shrink. The licensee states that the cracks will be filled with epoxy to protect the reinforcing steel from corrosion. This item is closed.

d. (Open) Sand, Aggregate, and Cement Test Reports (50-275 and 50-323/78-09).

A complete package of all required test reports were not available for review. The licensee had received a portion of the reports and stated that the rest were in the process of being transmitted and would be available for review during the next inspection. This item is open.

3. Structural Steel Welding

a. Review of Quality Assurance Implementing Procedures

The following Endurance Metal Products Co. (EMPCO) quality control procedures were examined:

- (1) QCP-6, Field Installation - Welding
- (2) QCP-8, Welding Electrode and Wire Control Program
- (3) QCP-9, Quality Control - Field Installation (Welding)
- (4) QCP-10, Nonconforming Items
- (5) QCP-12, Repair - Field Welding

The procedures had been approved by the licensee. The form QCF-3 had been revised to include the inspection of material placement (see IE Inspection Report 50-275 and 50-323/78-09). No items of noncompliance or deviations were identified.

b. Observation of Work and Work Activities

(1) EMPCO Activities

The inspector examined the completed welding on four checker plates and the in-process welding on eleven checker plates being installed at the 104' elevation of the Unit 1 Turbine Building. In addition, the temperature of weld rod holding ovens 1 and 2 and the checker plate storage area were examined. No items of noncompliance or deviations were noted.

(2) GFA Activities

The following welding activities related to the Turbine Building crane rail were examined:

- (a) Approximately 200 completed welds in Bays 14, 16, 18, 20, 22, 24, and 26.
- (b) Material fitup in Bay 30.
- (c) In-process welding in Bay 28.
- (d) The temperatures of Weld Rod Holding Ovens 4 and 5 and the weld rod issue activities in the oven 4 and 5 area.

It was noted that all work and inspections had not been completed in some of the Bays and a review of pertinent documentation did reflect this fact.

Welding activities on a structural steel addition to the Unit 1 containment annulus area were also examined.

The inspector noted that the structural steel welding in the Unit 1 Fuel Handling Building had been completed and the welds had been painted. Four completed welds in the Machine Shop on Columns 18⁴ and 19³ at elevation 166 ft. were visually examined. The welds exhibited excellent workmanship and had been properly prepared for ultrasonic examination.

The ultrasonic equipment calibration and examination of two welds on Column 18⁴ at elevation 166 ft. were observed. The equipment was properly calibrated and the examinations were conducted as required by the UT examination procedure and the AWS D1.1-1975 code. One reject weld was disclosed by the UT examination. The discontinuity was properly located and evaluated by the examination. No items of non-compliance or deviations were noted.

c. Record Review

(1) EMPCO Activities

The following quality related records were examined:

- (a) Field Installation Inspection Reports for the checker plate welding completed and in-process (see Paragraph 3.b.(1), above).
- (b) Welder qualification records for 10 welders.
- (c) The welding electrode issue records for June through July 7, 1978.
- (d) The Nonconformance Report Log and NCR Nos. 01 through 04.
- (e) The Hold Tag Issue Log.

No items of noncompliance or deviations were identified.

(2) GFA Activities

The following quality related records were examined:

- (a) Qualified Welder List
- (b) Welder qualification documentation for eleven welders.
- (c) Welding Electrode Issue Log of July 17, 1978 for Holding Ovens 4 and 5.
- (d) Material Certifications and Receiving Inspection Reports for 5 weld rod lots.
- (e) Field erection inspection documentation for NDE and visual examination of welding performed in Bays 14, 16, 20 and 22 of the Turbine Building crane rail.
- (f) UT and liquid penetrant examiner certifications for two Level II examiners.
- (g) Qualification records for three Structural Steel Erection and Bolting Inspectors.
- (h) UT equipment (SN 804002) certifications and 40 hour calibration records.
- (i) Transducer (SN B18429) certifications.
- (j) Field Erection Inspection Reports and UT Test Reports for welding in the Unit 1 Fuel Handling Building.

Discussions with GFA personnel indicated that the methods to be employed for final documentation were not procedurally specified and the system for identifying work remaining in the Turbine Building crane rail bays was not specified by procedure and appeared to be inconsistent. Licensee personnel stated that this situation would be evaluated and resolved.

No items of noncompliance or deviations were identified.

4. Structural Steel Erection and Bolting

a. Review of Quality Assurance Implementing Procedures

The following GFA quality control procedures applicable to Structural Steel Bolting were examined and appeared satisfactory:

QCP-3, Rev. 1 - Structural Steel Erection
QCP-7, Rev. 0 - Calibration Control and Status

No anomalies were noted.

b. Observation of Work and Work Activities

The inspector randomly checked completed bolted connections in the Unit 1 Turbine Building and Fuel Handling Building. The inspector noted that the bolts were being marked as required by QCP-3 after tightening and inspection. Observation of the completed work in the Fuel Handling Building disclosed that an existing bolted connection had been loosened to facilitate the slotting of holes in a structural steel member. The subject connection had not been tightened upon completion of the work. This item is being corrected in accordance with the provisions of the contractor's nonconformance control system.

c. Review of Quality Records

The Field Erection Inspection Reports, Bolting Inspector qualifications and torque wrench calibration records related to work in the Unit 1 Fuel Handling Building were reviewed. No items of nonconformance or deviations were noted.

5. Reinforcing Steel Welding

a. Observation of Work and Work Activities

The in-process and completed welding of reinforcing steel was observed at the following locations:

G line between Columns 21 and 22, vertical dowels
G line at Column 29⁴, vertical dowels to A-36 steel
A line, Unit #1, vertical dowels

The welders were observed using the proper procedures and materials for the applicable welding process. All portable rod ovens were plugged in and were maintaining the required

temperature. Approximately twenty (20) completed welds were examined and appeared to conform to AWS D12.1. No items of noncompliance or deviations were noted.

b. Review of Quality Records

The calculated carbon equivalents for the rebar to be welded were reviewed. The inspector noted that heat A1030, size eleven, grade 60 had been received onsite and was being welded in the structure. The carbon equivalent of this heat is 64.08 which is higher than the carbon equivalent of 59.17 of heat A2182, which was originally used to qualify Welding Procedures WS-RS-1, 2, 6 and 7. No evaluation as to the acceptability of this new heat for welding was made by the contractor. This item is being corrected by the contractor's nonconformance control system.

The E9018 Welding Electrode Issuance records for the month of June were reviewed. On June 5, 1978 the contractors onsite lost electrical power to their electrode holding ovens and portable rod cans. A periodic check by GFA disclosed that portable ovens 3 and 6, containing 100 electrodes, had dropped below the minimum holding temperature of 250° F to 225° F. The rods were subsequently removed from the field and placed in a rebake oven at 450° F overnight. AWS requires that E9018 electrodes be rebaked at 700-800° F for 1 hour. The rods were only exposed to ambient temperature (225° F minimum) during transfer between portable ovens and holding ovens. The rods were issued for use the next day. The failure to rebake the E9018 rods per AWS requirements is documented by the contractor's nonconformance control system and will be resolved accordingly. No items of noncompliance or deviations were noted.

6. Electrical and Instrumentation

a. Observation of Work and Work Activities

Four raceway supports, incorporating revisions specified by recent detail drawing changes, were examined. One raceway support had been mislabeled as to type, however, this item had been identified by licensee QA Audit No. 80611. The supports appeared to be installed in accordance with the applicable detail drawings.

The licensee had established mutually redundant circuit separation criteria and promulgated these criteria on Drawing No. 050029. The following safety related panels were examined for compliance with these criteria:

- (1) Diesel Generator Control Panels 1-1, 1-2 and 1-3
- (2) Unit 1 Hot Shutdown Panel
- (3) Mechanical Panel No. 30
- (4) Instrument AC Panel Nos. PY15 and 16
- (5) Main Annunciator Panels PK003, 004, 005 and 009
- (6) Rack wiring in the Diesel Generator System, Chemical and Volume Control System, Residual Heat Removal System and Safety Injection System Control Panels located in the Control Room.

It was noted that the Varglass sleeving had been frayed and the Scotch 7700 Tape did not extend into the conduit for mutually redundant circuit wiring in the Diesel Generator 1-1, 1-2 and 1-3 control panels. Since these systems had previously been turned over to the operations staff, the QA Supervisor stated that the appropriate organization would be notified and the situation corrected.

No items of noncompliance or deviations were identified.

7. Component Supports

The marginal weld undercuts previously observed (see IE Inspection Report No. 50-275/78-09, Paragraph 7.a) in baseplate welding for Mixed Bed Demineralizers 1-1, 1-2 and Evaporator Feed Ion Exchangers 1-2 and 1-4 has been evaluated by Foley. Discrepancy Report No. 8735-4 specifies repair of areas in excess of 1/32" undercut. This resolution was approved by the licensee and was in the field for work accomplishment. No items of noncompliance or deviations were identified.

8. Structural Concrete

a. Observation of Work and Work Activities

Concrete activities, including preplacement preparation, placement, form removal and curing for Lift No. S-11, were observed on the west side of the Turbine Building.

No anomalies were noted.

b. Review of Quality Records

Pertinent work and quality records associated with Lift Nos. S-10 and S-11 were examined. Records reviewed included inspection, curing, strength tests, qualification of personnel, material certifications, audits, Batch Plant certification and calibration. The records appeared satisfactory, except as noted below.

During review of personnel qualifications, it was noted that certification of the Batch Plant operator had not been accomplished as required by GFA's procedures, and that a NCR has been written to correct this item.

Concrete Specification 5422, Section 4.9.3, states that slumps shall be a maximum of $4 + 1$ inch for walls and slabs 11 inches thick or less, and a maximum of $3 + 1/2$ inch for all other work. Except where reinforcing steel and other embedded items make concrete placement a problem, slump may be increased as required with prior approval for each case. Design mixes had been approved for a maximum slump of 6 inches. Due to a typing error, the mix designs did not specify a tolerance and simply gave the maximum slump as 5". During record review, it was noted that several slumps exceeded the 5" maximum. PG&E has issued MVR No. 076 and is accepting "as is" the concrete based on previous compressive strength reports that the concrete will meet the design strength. The Concrete Specification will be revised to permit a maximum slump of $5" + 1"$.

9. Licensee Action on Construction Deficiency Reports

Repair of Pipe Support Assemblies

The program for the repair of pipe support trunnions and stanchions as described in the initial 10 CFR 50.55(e) report dated March 7, 1978 was examined. This examination consisted of a review of the status of the work, observation of in-process and completed work and the review of selected records associated with the repairs. The repairs in Unit 1 are approximately 85% complete. The following five pipe support assemblies were selected for examination:

<u>Support</u>	<u>Drawing No.</u>	<u>Sheet No.</u>
42-37A	049254	43
42-71A	049254	83
52-33A	049289	37
58S-85A	049264	109
58S-37A	049264	95

The visual quality of the completed welds was excellent and the surface was properly prepared for the applicable nondestructive examination. The quality records associated with the assemblies noted above were reviewed. These records included Field Process Sheets, Rod Issue Slips, Liquid Penetrant Examination Reports and Wall Thickness Measurement Sheets, where required. All records accurately reflected the status of the work and properly documented the repairs performed. No items of noncompliance or deviations were noted.

10. QA Audits

The licensee's internal audit system was inspected by examining nine QA audits performed during the period from May 25, 1978 through July 6, 1978. In the conduct of these audits, the licensee identified 14 findings which required corrective action. The corrective actions had been initiated or completed.

11. Nonconformance Reporting

GFA's nonconformance reporting system was examined. The system appeared adequate and a review of NCR's, plus discussions with cognizant personnel indicated that all identified nonconformances were being documented and written in a timely manner.

The PG&E Nonconformance (NCR) and Minor Variation Reports (MVR) generated since June 3, 1978, in the Mechanical, Civil and Electrical disciplines were reviewed. The documented deficiencies appeared to be properly classified as either an NCR or MVR in accordance with procedure and were being followed and closed out in a timely manner. No items of concern were identified by the inspector during this review.

12. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 13, 1978, and summarized the inspection purpose, scope and findings. The inspectors expressed their continued interest and concerns regarding the implementation of modification contractor QA/QC programs and noted that while the physical work appears to be satisfactory, there are some minor inconsistencies in the documentation of work activities. The licensee noted that additional evaluations of contractor activities would be performed and any inconsistencies would be resolved.