PACIFIC GAS AND ELECTRIC COMPANY
STATION CONSTRUCTION DEPARTMENT
DIABLO CANYON PROJECT

DIABLO CANYON RUPTURE RESTRAINT GENERAL REPAIR PROCEDURE

1.0 SCOPE

This procedure outlines the requirements for weld repairing of the defective rupture restraints. All welding repairs shall be made in accordance with AWS D1.1-79, Structural Welding Code - Steel.

2.0 BASE MATERIAL

The Base Material shall conform to any one, or any combination, of the following: ASTM A-36, A-441, A-572, A-515, A-516 and A-588. For shapes, A-515 shall not be used.

3.0 FILLER METAL

The Filler Metal shall conform to ASME Filler Metal Specification SFA 5.1, Type E-7018.

4.0 POSITION

Welding shall be done in all positions.

5.0 PREHEAT AND INTERPASS TEMPERATURE

△4 5.1 The minimum preheat temperature shall be as specified below. The minimum interpass temperature shall be the minimum specified preheat temperature, and the maximum interpass and preheat temperature shall be 800°F.

Metal Thickness	Temperature
Up to 3/4"	50°F*
Over 3/4" through 1-1/2"	150°F
Over 1-1/2" through 2-1/2"	225°F
Over 2-1/2"	300°F

5.2 The specified preheat and interpass temperature shall be maintained until the completion of each weld. Suitable preheat equipment and/or personnel shall be provided to assure compliance with requirements during periods of inactivity.

* Plates to be flame dried when below 70°F.

6.0 POST WELD HEAT TREATMENT

The completed welds shall not be given a post weld heat treatment.

7.0 WELDING PROCESS

All welding shall be done with the manual shielded metal arc welding process.

8.0 PREPARATION OF BASE METAL OR CAVITY FOR WELDING

2 8.1 The edges or surface of the parts to be repaired shall be prepared by flame cutting, air arc gouging, machining, drilling, grinding or any combination of these methods.

8.2 All flame cutting and arc gouging of weld preparations shall be performed using the preheat temperature specified for welding.

8.3 All flame cut and/or air arc gouged surfaces shall be ground to bright metal.

3 8.4 After surface preparation, all repair areas shall be magnetic particle examined using Department of Engineering Research Procedure No. 3212, "Magnetic Particle Examination of Welds in Pipe Rupture Restraints."

9.0 ELECTRICAL CHARACTERISTICS

The current used shall be DC Reverse Polarity.

10.0 WELDING TECHNIQUE

10.1 A Welding Technique Sheet shall be prepared for each repair. The Technique Sheet shall be submitted to P G and E for approval and shall include, as a minimum, the following information:

10.1.1 The configuration of the repair cavity or groove.

1 10.1.2 The sequence of welding, including the electride sizes to be used, along with the voltage and amperage to be used with each electrode size. Extra care is required to sequence all weld repairs so that residual stresses and distortion are minimized. Coped corner holes are not to be filled with weld metal.

10.1.3 The preheat requirements for the repair.

10.1.4 Peening requirements, if desired.

10.1.5 All special instructions concerning cleaning, weaving, or appearance of the weld.

10.0 WELDING TECHNIQUE - Continued

10.1 (continued)

10.1.6 The Nondestructive Test requirements for the repair.

10.2 Revision to the Technique Sheets shall be made only with the approval of P G and E.

11.0 NONDESTRUCTIVE TESTING

The completed weld repairs are to be nondestructively examined in accordance with the requirements of Engineering Specification 8833XR. The required examinations shall be performed at least 48 hours after completion of all full penetration and partial penetration welds which are thicker than 1/2 inch. The examination of other welds may take place at any time after completion of the weld.

R Dickson Ken
Department of Engineering Research

NRC CORR
IN

(1)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
SUITE 202, WALNUT CREEK PLAZA
1990 N. CALIFORNIA BOULEVARD
WALNUT CREEK, CALIFORNIA 94596

May 11, 1979

79-07

R5 INSP RPT EXTRACTS

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 of Diablo Canyon Units 1 and 2

This refers to the inspection conducted by Messrs. D. F. Kirsch, T. W. Hutson, D. P. Haist and G. Hernandez of this office on March 26-29, and April 5-6, 1979 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69, and to the discussion of our findings held by Mr. Kirsch with Messrs. R. Etzler, J. Hoch 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 this office, within 20 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

c. Review of Quality Records

The inspector examined a licensee QC audit of CUC welder performance qualification documentation and the welder qualification records of the three CUC welders. These items were examined for compliance with the licensee's QA procedures.

No items of noncompliance or deviations were identified.

10. Punch List

The inspector examined the licensee's punch list of remaining work items to be completed on Unit 1. The punch list contained 194 items.

The licensee's General Construction organization publishes a weekly letter identifying incomplete work items which are reviewed by corporate project engineering personnel.

The corporate project engineering department publishes a listing of open design and construction items on a monthly frequency and plans to increase the frequency to bi-weekly.

The licensee stated that controls necessary to demonstrate and assure the completion of all necessary safety-related construction/modification work activities, nonconformance and minor variation reports, punch list items, and design engineering activities would be formulated. These controls will be examined during a subsequent inspection (275/79-07-03).

11. Nonconformance and Minor Reports

The licensee's nonconformance reporting system was examined for compliance with the QA program requirements. Licensee records indicated that 11 NCR's and 115 MVRs remained to be closed out. The inspector examined NCR's in the disciplines of civil (Nos. 78-RC-001 through 008), mechanical (Nos. 78-RM-001 through 009 and 79-RM-001 through 005), and electrical (Nos. 78-RE-001 through 010 and 79-RE-001 through 005).

NCR No. DCI-79-RM-006 documented weld cracking problems observed on heavy weldments in highly restrained beams on the Unit 1 pipeway structure outside of containment. The licensee had identified 78 cracked welds and was in the process of evaluating the situation and determining necessary corrective actions. The Unit 2 pipeway was being inspected by the licensee to determine if similar problems exist. On March 4, 1979, the licensee informed Region V that this item was considered reportable under the requirements of 10 CFR 50.55(e) and that the required written report would be submitted.

The resolution of the NCRs examined appeared to conform to the licensee's QA program requirements.

No items of noncompliance or deviations were identified.

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NRC CORP
IN
(3)

August 24, 1979

FOR INFORMATION

AUG 30 1979

DIABLO CANYON SITE

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 of Diablo Canyon Units 1 and 2

This refers to the inspection conducted by Mr. D. F. Kirsch of this office on July 23-26, 1979 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69, and to the discussion of our findings held by Mr. Kirsch with Mr. R. D. Etzler and other members of your staff at the conclusion of the inspection.

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

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violations, enclosed herewith as Appendix A. This item of noncompliance has been categorized into a level as described in our correspondence to all NRC licensees dated December 31, 1974.

This notice is sent to you pursuant to the provisions of Section 2.201, of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within thirty (30) days of your receipt of this notice, a written statement or explanation in reply including (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved.

(Open) (275/79-13-01) §55.55(e) Item: Cracks in rupture restraint weldments.

(1) Examination of Program and Procedures

The licensee conducted an investigation program to determine those types of materials and joints affected by identified deficiency and determined that the problem was associated with A-441 and A-572 grade 50 steel (high strength, low alloy steels). The program was recently expanded to include shop welds as well as field welds. An examination of A36 steel welding (about 300 welds) had been conducted and, at most, only two indications had been found by the magnetic particle (MT) process (examination by MT was in excess of AWS D 1.1-79 requirements). These indications were repaired by a minimal amount of grinding.

The inspector examined the following Kellogg and licensee procedures for compliance with Q.A. program and AWS D 1.1-79 requirements.

(a) PG&E Department of Engineering Research Procedure No. 3212: Magnetic Particle Examination of Welds in Pipe Rupture Restraints

(b) Kellogg Procedure No. ESD-243: Pipe Rupture Restraints

(c) Kellogg Procedure No. ESD-273: Q.A. Final Walkdown and Documentation Review - Rupture Restraints

(d) Kellogg Q.A. Instruction No. 142: AWS Welding Preheat and Interpass Temperatures

(e) Kellogg Q.A. Instruction No. 143: NDE Requirements - Structural Welding

No items of noncompliance or deviations were identified.

(2) Observations of Work and Work Activities

The inspector examined the following work activities for compliance with AWS D 1.1-79 and procedural requirements.

(a) Twenty field repair welds on Unit 1 restraint bent 4B.

(b) Ten field repair welds on Unit 1 restraint bent 6B.

(c) Three field repair welds on Unit 1 restraint 1000-126.

(d) Preheat operations and conditions on one field weld of restraint bent 6B and one field weld of restraint bent 9.

(e) Magnetic particle testing on one field weld of restraint bent 4B.

(f) Three portable rod ovens for content correspondence to rod issue slips and temperature requirements.

The licensee's specification No. 8833XR-1 (Diablo Canyon Rupture Restraint General Repair Procedure) requires that repairs conform to AWS D 1.1-79 (Structural Welding Code). Pullman Kellogg Procedure ESD-243 and AWS D 1.1 require that "Arc strikes outside the area of permanent welds should be avoided on any base metal. Cracks or blemishes resulting from arc strikes shall be ground to a smooth contour and checked to insure soundness."

Contrary to the above requirements, the following conditions were observed on July 24, 1979:

(a) Six single spot arc strikes and one arc strike about 3/4-inch long existed on base metal below FW-63 of the upper box on restraint bent 4B. This field weld was inspected and accepted by Kellogg on July 17, 1979.

(b) One arc strike about 3/4-inch long existed on base metal near FW-65 of the lower box of restraint bent 4B. This field weld was inspected and accepted by Kellogg on July 16, 1979.

(c) One arc strike about 3/4-inch long existed on base metal of a steel member above FW-78 of restraint bent 6B. This field weld was inspected and accepted by Kellogg on July 4, 1979.

(d) Two arc strikes existed in base metal above FW-84 on the lower box of restraint bent 6B. This field weld was inspected and accepted by Kellogg on July 9, 1979.

This is an item of noncompliance (275/79-17-01).

(3) Review of Quality Records

The following quality records were examined by the inspector for compliance with AWS D 1.1-79 and procedural requirements:

(a) Numerous field process sheets associated with repair welds on restraint bents 4B and 6B.

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REGION V
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SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

NOV 26 1979

RECEIVED
STATION CONSTRUCTION DEPARTMENT
NOV 26 1979
DIABLO CANYON SITE

FOR INFORMATION ONLY

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 Units 1 and 2

This refers to the inspection conducted by Messrs. D. F. Kirsch, D. P. Haist and G. Hernandez of this office on October 23-26, 1979 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69, and to the discussion of our findings held with Mr. R. D. Etzler and other members of your staff at the conclusion of the inspection.

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

During this inspection it was found that one of your activities appeared to deviate from one of your commitments in the FSAR. This item and reference to the specific commitment are listed in Appendix A to this letter. Please submit to this office, within 30 days of your receipt of this notice, your written comments concerning this item, a description of any steps that have been or will be taken to correct the deviation, and the date all corrective actions were or will be completed.

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 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

excess reinforcement of between 3/32 inch and 1/8 inch was observed to be a total of approximately 18 inches in length on a 6 foot long seam. On the top head to shell interior weld the same excess reinforcement was observed to be a total of approximately 3 inches in length on a 20 foot long seam. Both Unit 1 and Unit 2 tanks exhibited these conditions.

The Unit No. 1 and 2 VCT were constructed to the ASME Code Section III as Class C tanks. Westinghouse Fabrication Drawing No. 110E213 S.H. 1 specifies radiography in accordance with paragraph UW-51 of ASME Code Section VIII. ASME Section VIII (1968), paragraph UW-51 specifies that the finished weld crown of joints to be radiographed may not exceed 1/16-inch for the reinforcement thickness of the VCT's. Full radiography is required on VCT tank seams.

The inspector examined Westinghouse Quality Control Releases QCR No. 5464 (Unit 1) and QCR No. 5688 (Unit 2) which indicate acceptability of RT film, records and visual inspections.

The excess reinforcement identified on the Units 1 and 2 Volume Control tanks appears to be a deviation from commitment. (50-275/79-22-01 and 50-361/79-12-02).

5. Licensee Action on 50.55(e) Items

(Open) (275/79-13-01 and IE Inspection Report 50-275/79-07) Cracks in rupture restraint weldments.

(1) General

The licensee stated that they had instituted and completed an expanded program to evaluate every full penetration field weld on the Unit 1 pipeway by magnetic particle examination to establish the adequacy of their program for joint identification and repair. A sample of shop welds had been selected for examination to form a data base to establish the adequacy of the originally specified inspection program applied by the vendor of the structural steel. The results of the shop weld examination program will be examined during a future inspection.

The licensee had begun an evaluation of the Unit 2 heavy section, highly restrained joints in the turbine building and pipeway. The Unit 2 evaluation and repair efforts will be examined during a future inspection.

(2) Observation of Work and Work Activities

The inspector visually examined about 150 completed or in-process repair welds on the following Unit 1 restraints in the turbine building and pipeway: Nos. 124, 125, 126 and 159; Bents 2B, 3, 4, 6B and 9; and two pipe restraints in the Unit 1 between auxiliary and turbine buildings. The welding appeared to conform to AWS D1.1 and procedural requirements. No items of noncompliance or deviations were identified.

(3) Review of Quality Records

The inspector examined the following quality records, as applicable, associated with restraint 124 (welds 10A, B, C, 17C) and restraint 125 (welds 9A, B, C and 10A, B and C): magnetic particle examination records, ultrasonic examination records, field process sheets for grinding and/or repair, preheat and interpass temperature, base metal repair records, and "as-built" documentation. The quality records appeared to conform to AWS D1.1 and procedural requirements. No items of noncompliance or deviations were identified.

6. Pipe Supports and Restraints - Observation of Work

The inspector randomly selected twelve Unit 2 pipe supports and restraints and visually examined their installations for conformance with drawing requirements. The selected design Class I support/restraint types and drawing numbers are listed below:

Support/Restraint Type	Drawing No.
Mechanical Snubber	051398 SH.29
Mechanical Snubber	051398 SH.14
Mechanical Snubber	051394 SH.45
Rigid multiple support	051368 SH.13
Rigid multiple support	051348 SH.137
Spring hanger	051359 SH.110
Spring hanger	051358 SH.15
Rigid hanger	051359 SH.142
Rigid hanger	051368 SH.10
Rigid support	051359 SH.7A
Rigid support	051359 SH.113
Rigid support	051357 SH.124

All supports and restraints examined appeared to be installed in conformance with the applicable drawing. No items of noncompliance or deviations were identified.

NRC CORP.
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WALNUT CREEK, CALIFORNIA 94596

MAR 4 1980

(2)

FOR INFORMATION ONLY

Docket Nos. 50-275/80-02
50-323/80-01

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

Attention: Mr. Philip A. Crane
Assistant General Counsel

Gentlemen:

Subject: NRC Inspection at Diablo Canyon Units 1 and 2

This refers to the inspection conducted by Messrs. D. F. Kirsch and P. J. Morrill of this office on February 11-14 and 20, 1980 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69, and to the discussions of our findings held with Mr. R. D. Etzler and other members of your staff at the conclusion of each inspection period.

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

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

In accordance with 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 this office, within 20 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.

4. Licensee Action on 50.55(e) Items

(Open)(79-13-01) Cracking in heavy rupture restraint weldments (See also IE Inspection Reports 50-275/79-13, 79-17, 79-22 and 79-26)

The inspector examined a sample of process sheets documenting the activities of nondestructive examination, grinding and/or thermal cutting and repair of Unit 1 rupture restraint weldments and visually examined in process and completed repairs in the Unit 1 GE/GW area. The acceptance criteria utilized included licensee procedures and AWS D1.1 (Structural Welding Code). No items of noncompliance or deviations were identified.

The licensee noted that the final report required by 10CFR 50.55(e) was in preparation and was tentatively scheduled for completion about April, 1980.

5. Licensee Action on IE Bulletins and Circulars

a. (Open) Bulletin 79-14 (See also IE Inspection Report 50-275/79-23):

The licensee submitted a response to Item 1 of the subject Bulletin by letter dated October 17, 1979 and committed to a response to Items 2 and 3 for Unit 1. The licensee was preparing the required response.

Discussions with responsible licensee engineering personnel indicated that design isometric drawings used in analysis for large bore and computer analyzed small bore piping had been compared with field prepared "as-built" isometric drawings. Deficiencies identified were being resolved by reinspection and/or reanalysis.

The inspector examined the licensee's system for the resolution of discrepancies identified by the above comparisons and observed that the system appeared adequate to both identify and resolve discrepancies.

The licensee anticipated that engineering work and field work necessary would be completed about May, 1980.

Actions required by the Bulletin for Unit 2 had not begun and will be addressed in future licensee submittals.

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REGION V
1990 N. CALIFORNIA BOULEVARD
SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

T. Lohr
NRC Corp
IN

(5)

JAN 21 1980

FOR INFORMATION ONLY

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 Units 1 and 2

This refers to the inspection conducted by Mr. D. F. Kirsch of this office on December 3-13, 1979 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69, and to the discussion of our findings held with Mr. R. D. Etzler and other members of your staff at the conclusion of the inspection.

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

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

In accordance with 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 this office, within 20 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

The inspector examined the licensee resolution and corrective actions and found them to be as stated in the letter of July 13, 1979. The hanger inspection program accomplished for Unit 1 had provided verification and/or resolution to assure that the angular orientation of S6 braces conformed to Engineering Department specified requirements. S6 brace tolerances are included as inspection criteria on the Unit 2 Raceway Support Inspection Sheets being used for the Unit 2 raceway support inspection program. This item is closed.

b. (Closed) Out-of-Tolerance Barton transmitters in narrow range steam generator water level control system. (See also IE Inspection Report No. 50-275/79-17

The affected Barton transmitters had been returned from the manufacturer and bench tested by the licensee. The inspector sampled the bench test data and examined the Westinghouse certification that the transmitters meet contract requirements. The installation of transmitters was scheduled to be performed in accordance with previously established licensee procedures. No items of noncompliance or deviations were identified. This item is closed.

c. (Open) Cracking in heavy rupture restraint weldments. (See also IE Inspection Reports 50-275/79-13, 79-17 and 79-22)

The inspector examined a sample of process sheets for non-destructive examination (NDE), grinding and/or thermal cutting of Unit 2 rupture restaint welds, NDE records and "as-built" documentation. The pullman summary sheet appears to adequately reflect the status of the weld sample examined. No items of noncompliance or deviations were identified.

5. Allegation of Faulty Concrete Construction

At the request of IE:HQ, IE:RV initiated investigative action to address an allegation of faulty concrete construction at Diablo Canyon. The IE:HQ request was apparently initiated in response to questions received from the California Governor's Office and an attorney for intervenors.

The particulars of the allegation are contained in paragraph VIII of Case No. 51676 filed with this Superior Court of the State of California for the County of San Luis Obispo and is quoted below. The name of the alleger has been deleted.

Danny - I gave this to Hank to add to the large ansaldo package submittal to us.
SDR

January 16, 1984

DER Welding Engineering has reviewed Pullman Power Products Procedures 15/16, 128, and 140. In a few instances, these procedures have been interchanged for the welding of attachments to stainless steel containment spray piping. In every case the procedure used was acceptable or compatible with the procedure specified on the process sheet. For these weldments any of the three welding procedures could have been used to achieve acceptable welds.

R.S. Blackman for
R. D. Kerr
Pacific Gas & Electric
Corporate Welding Engineer

DING TECHNIQUE SPECIFICATION NO. AWS 1-1

s document has been formulated to clarify the technique for applications
ild code [illegible] procedures as applied to manual welding only. This tec[illegible]-
[illegible] Data Sheet.

E: 5/17/79

ISION: 4 DATE: 12-20-79

PORTING PQR(s): Prequalified

chnique Specification for: Shielded Metal Arc Welding of ASTM A-36, A-441, 7½ GR. 50, A-588, A-515 and A-516 in any applicable combination in accordance th AWS D1.1-79.

se Metal: The base metal shall conform to those listed above. Other materials y be substituted with the approval of the Cognizant Welding Engineer.

se Metal Thickness: This technique is qualified for welding of materials of limited thickness in accordance with AWS D1.1-79.

ller Metal: The filler metal shall conform to AWS SFA 5.1, Type E-7018.

ion of Welding: Welding will be done in all positions. Weld progression l be vertical - up.

eheat and Interpass Temperature: Preheat and interpass temperature shall nform to those specified below:

BASE METAL THICKNESS (Actual)	MINIMUM PREHEAT °F	MAXIMUM INTERPASS °F
Up to 3/4"	50°F.	500°F.
Over 3/4" through 1 1/2"	150°F.	500°F.
Over 1 1/2" through 2 1/2"	225°F.	500°F.
Over 2 1/2"	300°F.	500°F.

hen metal temperature is below 70°F, material will be flame dried. The preheat enuirement of a joint is established by the thickest member being joined. The reheat applies to both sides of the joint and to the entire length of the joint minimum distance as shown below:

TYPE OF WELD	MATERIAL THICKNESS(t)	MINIMUM DISTANCE FROM POINT OF WELD DEPOSIT
Fillet, Partial Pen. ≤ 1/4 t, and e Metal Repairs 1/4 t	≤3 inches	3 inches
	>3 inches	(t) thickness of part
Full Penetration, Partial Pen. > ¼ t, Base Metal Repairs > ¼ t.	All Thickness	2 t

leanliness: All weld preps will be free of rust, scale, grease, and other contaminants for at least 1" from the weld prep edge.

eld Parameters: Welding parameters are specified in the table on page 3 of 3.

elding Technique: The welding technique shall be as follows:

A) BEAD WIDTH - All welding will be accomplished using the stringer bead technique. Weaving is allowed on the cover pass only to a maximum of 5 times the electrode diameter.

B) INTERPASS CLEANING - All weld beads will be free of all slag prior to continuation of welding. NEEDLE GUNS shall not be used for any cleaning operation.

C) DEFECTS - All visable defects, i.e., porosity, crater cracks, cold lap, shall be removed prior to the continuation of welding by grinding or or filling.

D) RUN-OFF TABS AND BACKING STRAPS - Run-off tabs and backing straps will be used whenever possible. Run-off tabs should be removed. Backing straps need not be removed unless specified by the owner or his designated representative. Removal of run-off tabs shall be accomplished by thermal cutting within 1/8" of the weldment and then blended into the base metal by grinding. Alternatively, removal may be entirely accomplished by grinding. Removal of backing straps will be accomplished by grinding or gouging to sound metal, and then back welded as needed. When any thermal process is used, the applicable preheat requirements are mandatory. Preheat may be maintained during grinding as desired.

E) BASE METAL BUILD-UPS - Base metal build-ups will conform in all aspects to this procedure.

F) WELD PROFILES - Weld profiles will be as follows:

1) Groove Welds - maximum reinforcement of 1/8" and shall blend smoothly into the base metal in accordance with the typical joint details and weld profiles, page 3 of 3.

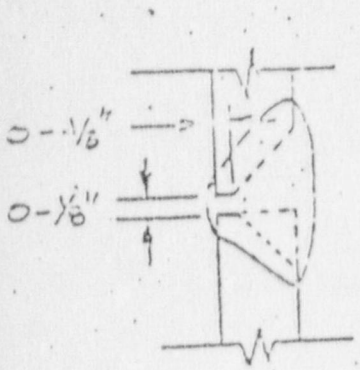
2) Fillet Welds - size in accordance with the field drawing (+1/8, -1/16 for 10% of weld length) and profile in accordance with the typical joint details and weld profiles, page 3 of 3.

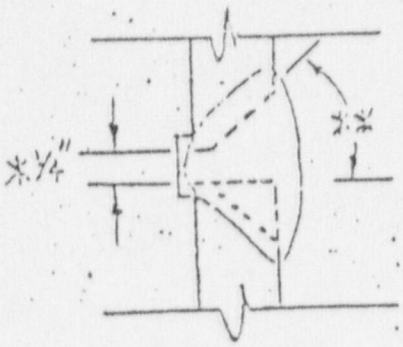
3) The final surface will be smooth enough as not to interfere with N.D.E. operations. Preheat may be maintained during final surface conditioning operations.

4) T-Joints and Corner Joints Groove Welds - maximum reinforcement of 1/8" and shall blend smoothly into the base metal with reentrant configurations in accordance with the typical joint details and profiles, page 3 of 3.

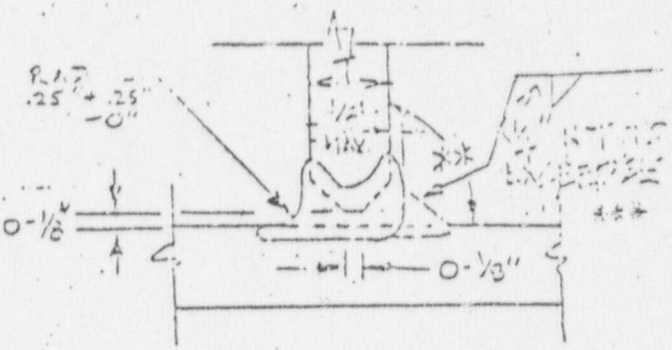
WPS No. AWS 1-1
PAGE 3 of 3
DATE: 12-20-79

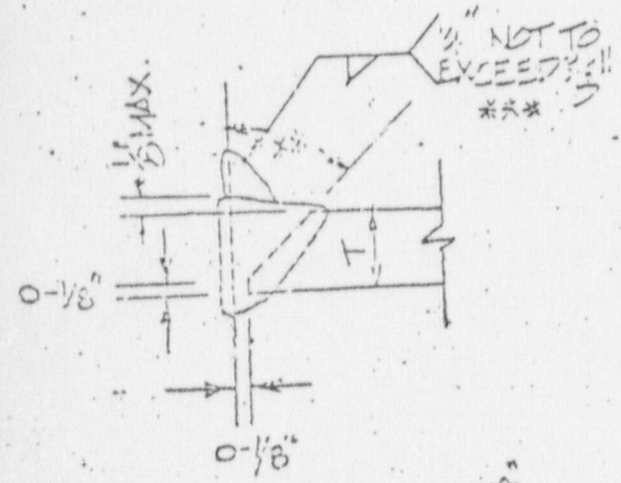
TYPICAL JOINT DETAILS

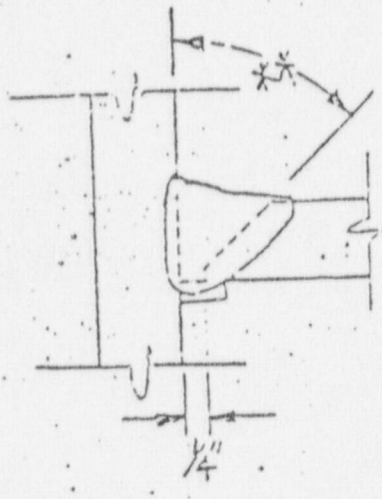


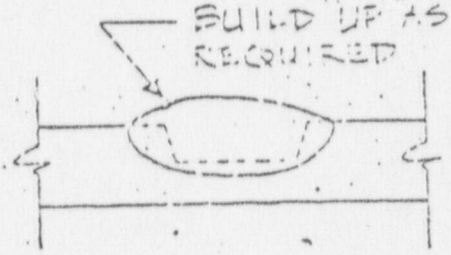


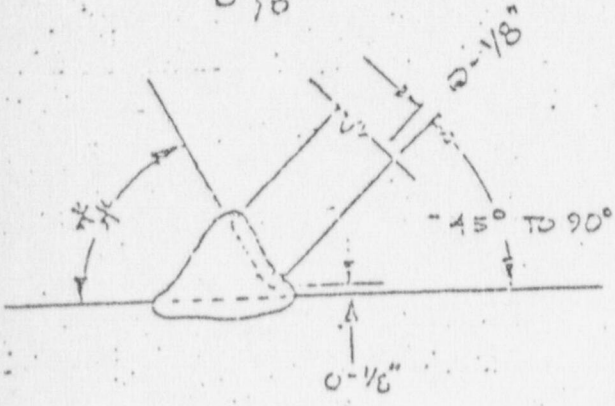
RE-ENTRY FILLET WELD

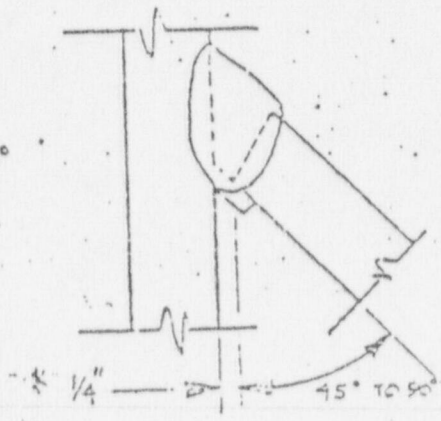


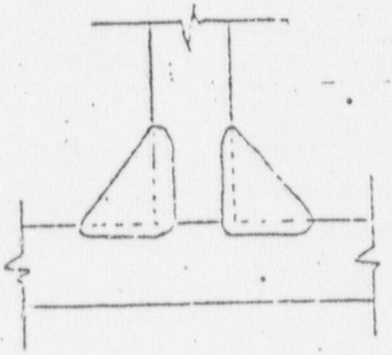












* ± 1/16 - 0" TOLERANCE
** JOINT DESIGN PER DETAIL SKETCH AS APPROVED BY CUSTOMER
*** - 1/16" FOR 10% OF WELD LENGTH

WELDING PARAMETERS

WELD LAYER OR PASS	PROCESS	FILLER METAL CLASS.	FILLER METAL DIA.	CURRENT TYPE POLA.	CURRENT AMP. RANGE	VOLT RANGE *	TRAVEL SPEED RANGE **	
All	SMAW	E7018	3/32	DCRP	65-120	27	2	
			1/8		100-165	31	2	
		--	5/32		140-220	34	3	** Minimum
			3/16		180-275	36	3	* Maximum

APPROVALS:

Prepared by: J. Casey 12-20-79 Cognizant Welding Engineer

Approved by: [illegible] 12/20/79 Q. A. Manager

[illegible] 12/27/79

Task: Allegation or Concern No. 214

ATS No: RV-83-A-0074

Characterization

Code 7/8 and 92/93 not technically the same.

Implied Significance to Plant Design, Construction, or Operation

See Task Allegation or Concern No. 103-119

Assessment of Safety Significance

See Task Allegation or Concern No. 103-119

Staff Position

See Task Allegation or Concern No. 103-119

Action Required

See Task Allegation or Concern No. 103-119

H136 342

Task: Allegation or Concern No. 215

ATS No: RV-83-A-0074

Characterization

Code 92/93 not qualified for unlimited thickness.

Implied Significance to Plant Design, Construction, or Operation

See Task Allegation or Concern No. 103-119

Assessment of Safety Significance

See Task Allegation or Concern No. 103-119

Staff Position

See Task Allegation or Concern No. 103-119

Action Required

See Task Allegation or Concern No. 103-119

Task: Allegation or Concern No. 216

ATS No: RV-83-A-0074

Characterization

Code 7/8 and 92/93 not interchangeable.

Implied Significance to Plant Design, Construction, or Operation

See Task Allegation or Concern No. 103-119

Assessment of Safety Significance

See Task Allegation or Concern No. 103-119

Staff Position

See Task Allegation or Concern No. 103-119

Action Required

See Task Allegation or Concern No. 103-119

Task: Allegation or Concern No. 217

ATS No: RV-83-A-0074

Characterization

Pullman performed a QA coverup through use of 1978 memo.

Implied Significance to Plant Design, Construction, or Operation

See Task Allegation or Concern No. 103-119

Assessment of Safety Significance

See Task Allegation or Concern No. 103-119

Staff Position

See Task Allegation or Concern No. 103-119

Action Required

See Task Allegation or Concern No. 103-119

S. D. Reynolds and W. J. Wagner OPINIONS based on Special Inspection (1/3-1/20/84) Findings:

Review of the allegations indicates in many cases that the items cited were indeed nonforming or deficiencies to meet the licensee's quality program, but were in fact picked up by the system, and answered by the system. The allegers in many cases questioned the system's answers and the system's authority to interpret "Codes and Standards" rules or to interpret some of the ambiguities or excessive conservatism in their areas (licensee's or licensee's contractors) specifications. The allegers in many cases challenged the "Engineer's" authorities granted by Codes and Standards rules (such as D1.1) where the intent of D1.1 is to require strict conformance to "cook book" methods where only "cook book design" rules are used, but where design by analysis or calculation rules are used, D1.1 permits fairly broad authorities to the responsible "ENGINEERS."

There were items discovered that were non-conforming and in some cases were QC system violations, but the majority of the items were QC or Engineering paper work "hits," that were picked up by the QA program, As-Built program, or Verification Program and do not represent a "Break down of the QA Program" but rather an inability of the allegers to acknowledge the engieers rights to make engineering decisions.

The investigation of these allegations indicated that there were no safety problems resulting from the areas alleged to be incorrect. The current on going NRC independent inspection conducted by Lawrence Livermore Labs further substantiates this position.

H/408 346

FINAL
HQP
3-15-84

Task: Allegation or Concern Nos. 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 214, 215, 216, and 217

ATS No: RV-83-A-0074 EN No: 84-009 (1/16/84)

Characterization

Multiple allegations associated with a failure of the licensee and Pullman Power Products to meet required codes and standards for welding pipe supports and pipe whip restraints.

Implied Significance to Design, Construction or Operation

The failure to meet stated codes and standards in the fabrication of pipe supports and pipe whip restraints may result in components which would not perform their intended safety function.

Assessment of Safety Significance

The allegations or concerns discussed in this section were received in the form of a 35 page letter from the alleger to a NRC Commissioner. Attached to the letter were numerous documents provided to support the allegers concerns. The staff's general approach to address these concerns was to interview the alleger, examine the contractors and licensee's written requirements, examine pertinent procedures, documentation, and to conduct interviews with personnel, as appropriate.

H135

The alleger's written submittal and interview included multiple cross referencing of issues. The staff did not examine every example of each type of issue individually, but instead focused on the substantive technical and quality concerns by grouped topics. Many of the issues were topics which had been formally documented and addressed by the licensees and contractor's control programs. The staff directed special attention to where the licensee and contractors addressed these items in a responsible manner. The staff has placed the issues into 21 topics. These are discussed individually below.

1. Allegations 103, 104 and 105:

Pullman Welding Procedure Specification (WPS) 7/8 was inappropriately applied in that deviations from WPS 7/8 existed in the following areas:

(a) structural shapes,

(b) weld joint geometry,

(c) materials

Staff Position

(a) The alleger is correct that WPS 7/8 was used to weld structural shapes in addition to piping and plate as specified in the WPS. However, the structural shape of the member is not required to be included in the WPS. All structural shapes, such as W, H beams and angle iron, shall have the connecting sections prepared to conform to the weld joint configuration of the qualified WPS. The structural shapes are identified on the design drawings.

(b) The alleger is correct in stating that the WPS documents do not adequately illustrate all joint types which are welded. WPS 7/8 is qualified in accordance with ASME Section IX requirements which indicates in QW 402.1 that a change in joint type is a non-essential variable. Lack of description of all types of joints utilized is contrary to Section IX rules and requires a revision to the WPS. However, this is an administrative change only and does not require requalification of the WPS.

(c) In response to the allegation regarding unapproved welded materials, the staff reviewed each type of material identified by the alleger. Certain of these materials such as A500 and A307 were not listed in the published code but were approved for use by a separate code case. The staff is satisfied that all the materials of concern in this allegation were properly approved for ASME or AWS usage.

2. Allegations 106, 107 and 108:

The alleger stated that Welding Technique Specification No. AWS 1-1 was not applied to AWS welding in that, (a) AWS 1-1 was not referenced on every Pipe Rupture Restraint Welding Process Sheet, (b) AWS 1-1 was written and approved by an unqualified individual, and (c) AWS 1-1 specified an unlisted AWS code material.

Staff Position

(a) The alleger is correct that in some cases QC failed to clearly identify on the weld process sheets when welding was to be conducted to the WPS plus the Welding Technique Sheets. However, the use of Welding Technique Sheets to amplify and clarify WPS documents is an accepted standard industry practice. At Diablo Canyon the significant clarification made by the Welding Technique Sheet is the introduction of tighter controls on preheat. Whether this information was directly tied to the WPS through the technique sheet is of little consequence since the same information is clearly stated in other relevant documents (EDS 223 and EDS 243). As the preheat is covered in all cases, the inclusion of the exact document, whether it is the WPS or Welding Technique Sheet identification, is considered to have no engineering or quality related significance.

(b) The alleger expressed concern that a Welding Technique Sheet was prepared by an unqualified individual. In so doing Pullman utilized a QA/QC person to perform a function out of his area of expertise and permitted this individual to audit his own work. The staff found that there are no codes and standards requirements that state that a WPS or Welding Technique Sheet must be prepared by a specific individual. The only requirement is that the document adequately address the codes and standards variable rules i.e., essential and non-essential variables. The WPS documents and Welding Technique Sheets met the rules (with the exception of the QW 402.1 non-essential variable as previously discussed) and were properly approved by the licensee. QA/QC personnel normally monitor

implementation of programs and procedures, the fact that they may have assisted in writing the implementing procedures does not support the conclusion that QA/QC is auditing its own work.

(c) The alleger is correct that ASTM A515 steel is not listed in AWS D1.1 as an approved welding material. The staff found that A515 is not listed in AWS D1.1 Structural Welding Code because A515 is normally considered as a pressure vessel material. However, A515 was properly qualified and is acceptable material for welding structures in compliance with AWS D1.1 rules.

3. Allegations 109 and 110:

The alleger states that structural steel pipe supports were not designed, fabricated and erected to the American Welding Society (AWS) code. He further states that the PG&E Contract Specification 8711 requires pipe supports to comply with the applicable standards of the ASTM, ANSI, ASME, MSS, AWS, and PFI. Additionally, he states there was no change to the PG&E contract specification to allow pipe support to be worked to a standard other the AWS.

Staff Position

The staff found that the pipe support work was properly done to the ASME code which is permitted by the AWS code. Supporting details of the staff's findings are as follows:

- The American Welding Society D1.1 permits the ENGINEER to "accept evidence of previous qualification." It is normal practice to interpret this as permitting ASME Section IX welding qualification in lieu of D1.1 qualification by testing. In addition, the 8711 Specification Section 3 (para 4.11 and 4.12) require performance and procedure qualification in accordance with Section IX. Based on staff reviews, the welding qualification methods utilized by Pullman meet ASME Section IX requirements.

- The materials for pipe support welding were: A36, A500, SA515, SA516, and bolting materials A307, and A108 (grades 1010-1020). The staff found that each of these materials is suitable and allowable for ASME pipe support welding.

The staff reviewed Pullman procedure qualification documentation for engineering justification for welding in accordance with current ASME Section IX and AWS D1.1 rules (through utilization of the ENGINEER'S prerogatives in paragraph 5.2). This review included the procedure qualifications for "as-welded" fabrications and the following types of welding: ASME P1 to P1 material using shielded metal arc welding (SMAW); AWS Group I to Group I, using SMAW; AWS Group II to Group I and II, using SMAW; Welding of SA500, A441, A588, using SMAW; welding ASME P1 to AWS Group I using gas tungsten arc welding (GTAW), ASME P8 to P8 using SMAW; ASME P8 to P8 using GTAW; tack welding, using SMAW or GTAW. Various thickness ranges were included.

All WPS documents were properly qualified for AWS welding, all structural steel fabrication met AWS requirements. Therefore, no contract specification change was required or needed

4. Allegation 111 and 112:

Contract Specification No. 8833XR was not officially changed/revised to reflect that procedure qualification in accordance with ASME Section IX may be used in lieu of AWS D1.0-1969.

Staff Position:

The staff found that no contract specification change was required because the AWS Code allows qualification of "other processes" and "evidence of previous qualification" of joint procedure qualification. In this case, Pullman Power Products provided evidence of qualification to ASME Section IX, which is allowed by the AWS Code. Therefore, no contract specification change or revision was needed since no deviation from the contract specification had taken place.

5. Allegation 113:

Contract Specification No. 8833XR requires welders to be qualified to the AWS Code, instead Pullman utilized welders qualified to ASME Section IX to perform the scope of work required by the contract.

Staff Position

The staff found that ASME Section IX qualified welders are qualified to AWS rules if the AWS thickness criteria is properly addressed. The staff found that the AWS thickness criteria was properly addressed and therefore, the Pullman welders were qualified in accordance with Contract Specification No. 8833XR requirements.

The licensee's and contractors practice of using ASME/AWS qualified welders is reasonable and acceptable in this case.

6. Allegation 114:

Pullman utilized welding procedures which have not been tested for notch toughness in the weld Heat Affected Zone (HAZ) for weldments made under Contract Specification 8833XR (pipe restraints). Contract Specification 8833XR requires in Section 3.6 such qualification. The Pullman practices in this area represent a deviation from the contract specification.

Staff Position

The alleger is correct in that Contract Specification 8833XR does require HAZ notch toughness verification. However, this requirement was clarified with a contract revision which indicated that notch toughness is required (only) if specified on the drawing.

Licensee correspondence and staff reviews indicate that HAZ notch toughness is not required, and therefore, the design of the rupture restraints does not require welding qualification documents demonstrating HAZ notch toughness. The licensee position that notch toughness verification is not required is documented in a licensee to NRC memo dated Janauary 18, 1984. Notch toughness in the weld HAZ is not a code or NRC requirement for rupture restraints.

Therefore, the alleger is correct that the Pullman practices in this area appear to represent a deviation from the contract specification, however, the staff found that because of the licensee correspondence referenced above no deviation from Contract Specification 8833X had occurred.

7. Allegation 115:

No Contract Specification Change Notice was issued authorizing the deletion of full penetration welds less than 9/16 inch effective throat from the ultrasonic examination program for the repair of pipe rupture restraints.

Staff Position

The staff's examination of licensee documents and discussions with engineering and quality assurance individuals revealed that the licensee's Engineering Department did not formally revise or process a design change allowing a deviation from Contract Specification 8833XR, paragraph 7.21. This item is not considered a safety problem because all

the technical requirements and procedures for ultrasonic examination were reviewed and approved by the licensee. However, it does represent an unauthorized change which is not in strict compliance with Engineering Department Procedure No. 3.6 "Design Changes." This failure to formally change the contract specification appears to be an oversight on the part of the licensee, since all appropriate reviews were conducted, and approvals obtained.

Therefore, the alleger is correct that no contract specification change was initiated, however, based on the above no safety significance is attributed to this administrative oversight.

8. Allegations 116 and 117:

Pullman weld procedure code No. 88/89 was used to weld plate when the procedure was qualified for pipe welding under ASME Section IX. The Pullman weld procedure was never qualified in accordance with the AWS Code as required by Contract Specification No. 8833XR.

Staff Position

The staff found that no contract specification change was required because the AWS code allows qualification of "other processes" and "evidence of previous qualification" of joint procedure qualification. In this case, Pullman Power Products provided evidence of qualification of WPS 88/89 to ASME Section IX, which is permitted by the AWS Code. The AWS Code states that qualification on pipe shall also qualify for plate.

Therefore, no contract specification change or revision was needed because no deviation from contract specification had taken place.

9. Allegations 118 and 119:

Pullman Power Products uses a Welding Technique Sheet (AWS 3-1) to allow Gas Tungsten Arc Welding (GTAW) and a material (A515 steel). Neither of which are not allowed by the AWS Code.

Staff Position

This allegation is addressed as two parts as follows:

a. Gas Tungsten Arc Welding is not allowed by the AWS Code (Allegation 118)

The alleger is correct that the gas tungsten arc welding (GTAW) process is not specifically covered in the body of AWS D1.1. However, AWS D1.1 (paragraphs 1.3.4 and 5.2) permits qualification of "other processes" and "evidence of previous qualificiation" of joint procedure qualification. Pullman Power Products has demonstrated proper ASME qualification of this process and is, therefore, considered satisfactory for welding supports and restraints.

The GTAW welding process was qualified in accordance with AWS D1.1 provisions; therefore, there is no safety or quality management significance attributed to this allegation.

b. Grade A515 Steel is a Material not Listed as Approved in the AWS Code (Allegation 119)

The alleger is correct that ASTM A515 steel is not listed in AWS D1.1 as an approved welding material. A515 steel is not listed in AWS D1.1 because the steel is normally considered as a pressure vessel material. However, A515 was properly qualified and is acceptable for welding structures in compliance with AWS D1.1 rules.

10. Allegations 214, 215, 216, and 217:

The use of Code 92/93 to weld pipe rupture restraints when the process sheets specified Code 7/8 and Pullman's justification for this change is a major breach in the welding Quality Assurance Program.

Introduction

The alleger refers to a September 15, 1978 memorandum to file from the Assistant QA/QC Manager. This memorandum states, in part, "Both weld codes 7/8 and 92/93 are qualified to allow welding of unlimited thickness on structural members under AWS requirements. Technical aspects of both procedures are the same."

Assessment of Safety Significance

The staff examined the referenced memorandum and supporting documentation. Based on this review, it is clear that the alleger has four issues in question. The following is a characterization of these four issues along with the staff's conclusions:

a. Allegation 214:

The alleger's concern was that Welding Procedure Code 7/8 and 92/93 were not identical. He lists a number of welding parameters which are different between the two weld procedures. The staff found that the alleger is correct the procedures are not identical, though from a technical standpoint they are both acceptable for the work required (the rupture restraint work). This allegation appears to be an apparent misunderstanding on the alleger's part on the interchangeability of the welding procedures.

b. Allegation 215:

This concern is whether or not Code 92/93 is qualified to allow welding on unlimited thickness structural members under AWS requirements. Based on staff examination of AWS D.1-1 and Pullman's use of Code 92/93, the staff concludes that Code 92/93 has been properly qualified.

c. Allegation 216:

This issue is that Code 92/93 is not a suitable substitute for Code 7/8. As mentioned in item 1 above, even though, the two documents are not technically identical, they are both technically adequate for the work that was performed. Therefore, there is no safety significance associated with this issue.

d. Allegation 217:

Based on the alleger's concerns that the above three issues were safety significant, the alleger concluded that Pullman's QA/QC management attempted "to cover up a serious breach in the Quality Assurance program for welding Pipe Rupture Restraints...." However, because of the existence of the Assistant QA Manager's memorandum and the alleger's misinterpretations discussed above, the staff cannot see any objective basis for the conclusion that a "cover up" was attempted or existed. To the contrary the Pullman memorandum makes it a formal document available for all to see and review.

Staff Position

The allegation is not substantiated. It may have been generated, in part, because of a misinterpretation of the September 15, 1978, Interoffice Memorandum.

Action Required

None.

11. Further Allegations

A further staff examination of the alleger's submittal disclosed the following information:

This allegation relates to the installation of the Unit 1 containment spray ring piping in 1972. A review of the records associated with this activity resulted in the identification of discrepancies between the weld process sheets and weld rod requisition documents. These discrepancies were documented on Pullman Discrepancy Report (DR) No. 4713, dated April 14, 1983. The alleger contends that the Discrepancy Report misrepresents the discrepancies in order to cover up more significant Quality Assurance/Quality Control problems. More specifically the alleger states that:

a. DR No. 4713 did not identify the fact that the Production Department disregarded the process sheet and the specified weld procedure and substituted their own unauthorized and unapproved weld procedure (Code 15/16).

b. The DR does not address the failure to detect the discrepancies at the time they occurred.

c. The DR states that all welders were qualified, when, in the alleger's opinion one welder's (Welder "N") qualification status cannot be assured for the time period involved (since the Ninety Day Welder's Activity Log was not maintained from August 1972 to December 1972).

Staff Position

To address these issues the staff reviewed the DR, the contractor's response to the DR, examined evidence of weld procedure approval and interchangability, examination of welder activity logs, process sheets rod requisition documents, and other records. The allegers concerns are addressed below:

a. Use of unapproved and unauthorized weld procedure Code (Code 15/16).

A staff examination of the weld procedure in question (Code 15/16) disclosed that it had been properly qualified and approved. Therefore, the alleger's statement that unapproved procedures were used is incorrect. The statement is correct that the record discrepancies make it somewhat unclear as to which specific procedures were used. The staff, therefore, requested the licensee to perform a technical review of weld procedure interchangability. The conclusion of the review was that, for the weldments in question, any of the welding procedures listed could have been used to achieve acceptable welds. The staff concludes that there is no

technical significance to the record discrepancies in this case. The general implications of record errors follows in item b.

b. Failure to detect the discrepancies at the time they occurred indicates a significant breakdown.

The alleger contends that since the personnel involved in the work at the time (crafts, QC/QA, supervisors) failed to detect the discrepancies and that this is indicative of a significant breakdown. The staff examined the situation to determine whether the record discrepancies were widespread (significant) or somewhat isolated. To assess the magnitude of the record discrepancy problem, 300 weld process sheets were reviewed. 100 for the Containment Spray System, 100 for Chemical and Volume Control System and 100 for Component Cooling Water system. These process sheets are for welds (piping to piping, attachments to piping, and pipe supports) completed between April 1972 and October 1975. There are 531 weld rod requisitions associated with these process sheets. The staff examined results of these reviews. The results showed that 20 weld rod requisitions records (15 Containment Spray, 5 Component Cooling Water) have a WPS listed on them that is not in agreement with the process sheet. This equates to 3.7 percent. Based on the results of the review it does not appear that record discrepancies were a widespread problem.

were appropriately qualified. It does not appear that Discrepancy Report No. -4713 misrepresents the scope of the problem. It appears that licensee and contractor management handled the problem in a acceptable manner.

Overall Staff Position

The staff's review of the above allegations disclosed that there were minor, isolated weaknesses in implementation of the contractor's and licensee's program. However, these discrepancies were not widespread and were primarily administrative in nature. The welding processes, welding procedures, welded materials, welders and nondestructive examinations were found to be in accordance with the required codes and standards.

In general, it appears that the licensee and his contractor managed their activities in a reasonable manner.

Action Required

None.

Task: Allegation or Concern No. 149

ATS No.: RV 84A016 BN No.:

Characterization

Foley did not submit HVAC as-built information during 1981/82; as-built may not be checked against design.

Implied Significance to Plant Design, Construction, or Operation

If true this concern may result in instances where the HVAC system or supports may not perform as intended by the designer.

Assessment of Safety Significance

The staff requested that the licensee conduct an evaluation of this concern. The licensee found that the installed condition of the duct work conformed to design. This was further reinforced based upon satisfactory completion of flow balance and pressure differential testing. The licensee stated that the as-built conditions of support structures was in the process of evaluation. Therefore, the staff feels that further evaluation of this concern would not likely result in any new management or quality performance issues.

Action Required

This item will be turned over to PG&E for evaluation and ~~resolution~~ response. The licensee will be required to provide the results of their evaluation, and any necesssary corrective actions, to the staff in writing.

FAX to HANS
Schierling
Phillips
1337 PST
3-15-84

H/42

Task: Allegation or Concern No. 150

BN No.:

ATS No.: RV 84A016

Characterization

Foley production may have falsified structural steel and tubing heat number records. (No specific examples were provided)

Implied Significance to Plant Design, Construction, or Operation

The staff's face value assessment is that this concern involves only minimal safety significance.

Assessment of Safety Significance

The alleger indicated that he knew of no specific examples of such falsification but stated that Foley production was in the process of assuring that quality documentation was in order. The alleger was told that one item being resolved by Foley production was in the area of steel and tubing traceability to material certifications and that in this process several instances required that a QC inspector inspect material in the field to verify that a material heat number was stenciled onto the installed piece. The alleger had heard that, if the material was not so stenciled, production would research the records and select a traceability number based upon material type, shape and time of issue. Thus, the alleger concluded that there was a possibility that traceability documentation of installed materials could be falsified.

The staff considers that, even if true, this concern involves only minimum safety significance because Foley structure steel was purchased as an off-the-shelf, commercial grade material which was supplied with, and receipt inspected for evidence of proper material physical and chemical properties. Stainless steel tubing is mainly 3/8 inch material which is similarly receipt inspected and supplied with evidence of conformance with specified chemical and physical properties and hydrostatically tested following installation.

H/43

Thus, the staff considers that exhaustive evaluation of this concern would not likely result in any new significant management or quality performance issues.

Action Required

This item will be turned over to PG&E for evaluation and resolution. The licensee will be required to provide the results of their evaluation, and any necessary corrective actions, to the staff in writing.

Fax to Hans Schierling Philips Bldg 1-338 PST 3-15-84

Problem Statement

Allegation #(s): 149,150

ATS No.(s): RV 84 A 0016

BN(s):

This document lists (or directly references) each allegation or concern brought to the attention of NRC personnel. The purpose of this statement sheet is to assure that all points raised by the alleger are covered.

If the problem statement is not clear as to who, what, where, when, or why regarding the issue, the commentary section will amplify the statement. The commentary section will also be used if there is apparent conflicting information or if there is no or very little original information available which describes the concern(s). (This can occur if, for example, a line concern was received in an interview).

Problem Statements (use extra sheets as necessary)

Allegation# | Verbatum Statement or Reference

See Master Problem Statement

149 & 150

Commentary

Confidential Foley interviews were the source of these two allegations.

Date This Statement was Completed 3-20-84 [signature]
Technical Reviewer Signature

H/44 [initials]

Task: Allegation or Concern No. 151

ATS No.: RV 84A017

BN No.:

See allegation #123

Characterization

(1) Foley installs too many conduits on supports; (2) inspection reject rate is too high for supports. (No specifics were provided)

Implied Significance to Plant Design, Construction, or Operation

The staff's face value assessment of this issue is that it constitutes minimal safety significance.

Assessment of Safety Significance

The staff's review determined: (1) The licensee has specified definitive design and installation criteria for the maximum number and size of conduits that may be installed on a particular support, and (2) this allegation is vague, with no specific examples provided. The alleger did not provide any documentation, conduit support locations, or other information to support this allegation. The staff and NRC consultants (Lawerence Livermore Laboratory) have examined several hundred conduit supports in the past without identifying any significant problems.

Staff Position

The staff's evaluations indicate that this issue would not result in any new significant management or quality performance issues.

Action Required

This item will be turned over to the licensee for evaluation and ~~resolution~~ response. The licensee will be required to provide the results of their evaluation and any necessary corrective actions to the staff in writing.

FAX to Hans Schierling, Phillips Bldg. 1st Flr 3-15-84 H/45

279.4

FILE COPY

Task: Allegation or Concern No. 153

See allegation #123

ATS No.: RV 84A017 BN No.:

Characterization

Foley specifies 1/8" welds on 3/32 clamp material.

Implied Significance to Plant Design, Construction, or Operation

The staff's initial assessment indicates that this issue is of minimal safety significance.

Assessment of Safety Significance

The alleger's concern is that an oversize weld is being specified (i.e. 4/32" (1/8) to 3/32 clamp material). The staff had previously examined welding in this area (uni-strut/superstrut) and found no significant problems.

The staff's evaluation indicate that this issue would not result in any new significant management or quality performance issue.

Action Required

This item will be turned over to PG&E for evaluation and ~~resolution~~ response. The licensee will be required to provide the results of their evaluation and the necessary corrective action to the staff in writing.

FAX to Hans Schierling
Phillips Bldg.
1341 PST
3-15-84

H-46

Task: Allegation or Concern No. 154

ATS No: RV-84-A-0017 BN No:

Characterization

Foley does not specify adequate inspection criteria for anchor bolts.

Implied Significance to Plant Design, Construction, or Operation

See Task Allegation or Concern No. 25

Assessment of Safety Significance

See Task Allegation or Concern No. 25

Staff Position

See Task Allegation or Concern No. 25

Action Required

See Task Allegation or Concern No. 25

H-117 #7
280-A

Master

Problem Statement

Allegation #(s): 123, 124, 125 + 135, 136, 137, 139, 133, 134 +

ATS No.(s): 140, 141, 143, 144, 145, 146, 148, 149 +

BY(s): 150, 151, 152, 153, 155, [redacted], [redacted] +

This document lists (or directly references) each allegation or concern brought to the attention of NRC personnel. The purpose of this statement sheet is to assure that all points raised by the alleger are covered.

If the problem statement is not clear as to who, what, where, when, or why regarding the issue, the commentary section will amplify the statement. The commentary section will also be used if there is apparent conflicting information or if there is no or very little original information available which describes the concern(s). (This can occur if, for example, a line concern was received in an interview).

Problem Statements (use extra sheets as necessary)

Allegation#

Verbatum Statement or Reference

This stack of allegations includes information gained from a group meeting at Diablo Canyon and other on site interviews. The attached document is the listing of the allegations. There are no other known documents other than this and attached sheets, which define the allegation better...

Commentary

Date This Statement was Completed 3-16-84 HJ Conta

Technical Reviewer Signature

H148 46 281-11

035715

INTEROFFICE MEMORANDUM

Diablo Canyon Project

PACIFIC GAS AND ELECTRIC COMPANY
BECHTEL POWER CORPORATION

To R. C. Thornberry/J. D. Townsend

From G. H. Moore

Of Project Engineer

At 46/10/C33 Extension B-02963

Date October 27, 1983

File No. 146.10

Subject Piping Flange Analysis Requirements

The following is Project Engineering's input to Nuclear Plant Problem Report DCI-83-MM-P0178.

The intent ANSI B31.7, 1969 Edition with 1970 addenda, is to require detailed calculation for flanges on Class 1 and 2 piping only for non-standard flanges. The requirements for Class 1 components explicitly states that only non-standard flanges require analysis per paragraph 1-704.5. This is stated in paragraphs 1-703 and 1-704.7. For Class 2 components the intent of paragraph 2-704.5 is that only non-standard flanges will be analyzed to paragraph 1-704.5. This is consistent to the Class 1 criteria. This interpretation is supported by both PG&E M&E, and Bechtel Plant Design.

Furthermore, four code experts who were involved with the original development of the B31.7 code were contacted. They all agreed that the intent of B31.7 was that only non-standard flanges need to be analyzed to paragraph 1-704.5. Two of these experts are from major AE firms and one is from a NSSS supplier, and one is a consultant to the industry. A search of B31.7 code cases and interpretations has not uncovered any related information to this subject.

Therefore, since only standard flanges per B16.5, which have been qualified for system design pressures and temperatures, have been used we conclude that detailed analysis is not required.

Please contact D. C. Crosby if you have any further questions.

G. H. Moore

DCCrosby/kb
Reply Requested: No
cc: LEShipley
SSChitnis
RHanninge MPO
PHirschberg
LWomack MPO
VPMercado
EJadelrat
MKhalafalla
DSHardie
GVCranston
MELeppke MPO
RTaylor MPO
JDTaylor MPO

043kb

Questions for Interpretations

Question: Under the rules of USA Standard B31.7-1969 Edition with 1970 Addenda, what code analysis is required for the following flanges:

a) Class I standard flanges meeting the requirements of ANSI B16.5-1968 edition;

b) Class I special flanges not designed in accordance to the requirements of ANSI B16.5-1968 edition;

c) Class II standard flanges meeting the requirements of ANSI B16.5-1968 edition;

d) Class II special flanges not designed in accordance to the requirements of ANSI B16.5-1968 edition;

e) Class III standard flanges meeting the requirements of ANSI B16.5-1968 edition;

f) Class III special flanges not designed in accordance with the requirements of ANSI B16.5-1968 edition?

Question: Under the rules of USA Standard B31.7-1969 Edition with 1970 Addenda, what code analysis is required for bolting material in the following flanges:

a) Class I standard flanges meeting the requirements of ANSI B16.5-1968 Edition;

b) Class I special flanges not designed in accordance with the requirements of ANSI B16.5-1968 Edition;

c) Class II standard flanges meeting the requirements of ANSI B16.5-1968 Edition;

d) Class II special flanges not designed in accordance with the requirements of ANSI B16.5-1968 Edition;

e) Class III standard flanges meeting the requirements of ANSI B16.5-1968 Edition;

f) Class III special flanges not designed in accordance with the requirements of ANSI B16.5-1968 Edition?

Question: Does Division 1-703 of USA Standard B31.7-1969 Edition with 1970 Addenda obviate the requirement for performing the flange analysis of Subdivision 1-704.5 by stating that "components that meet the requirements of ... Subdivision 1-704.7 satisfy the requirements of Division 1-704 and only the analysis required by Division 1-705 need be performed" since Subdivision 1-704.7 refers to Table 1-726.1 which contains a reference to ANSI B16.5, "Steel Pipe Flanges and Flanged Fittings"?

H/50

FACSIMILE COVERSHEET

DATE: 3/2/84

TO: Chris Lorenzen

FROM: D'Angelo

NO. PAGES 1 of

SUBJECT: Dist. Allegation

MESSAGE:

Please see Chris

ASAP.

Thx

Tom

H1512

3/7/87

Chris -

Attached is NSTIC 1977
and procedures as follows.

NC-3647.1 says you can
pick standard flanges from
Table NC-3132-1 as long as you
limit yourself to NC-3612.1
which says you don't exceed the temperature
pressure limits established by the standard
(ANSI B16.5).

Table NC-3132-1 says that
for flanges ANSI B16.5-1977 in
the standard and contains the pressure
temperature limit.

~~The~~

Note: No pressure equation (Peq)
is given just pick from ANSI B16.5

	Standard	Designation
	PIPES AND TUBES	
	Welded and Seamless Wrought Steel Pipe	ANSI B36.10-1970
	Stainless Steel Pipe	ANSI B36.19-1965 (Rev. 1972)
W77	**FITTINGS, FLANGES, AND GASKETS**	
	Steel Pipe Flanges and Flanged Fittings	ANSI B16.5-1977
	Factory Made Wrought Steel Buttwelding Fittings	ANSI B16.9-1971
	Forged Steel Fittings, Socket-Welding and Threaded	ANSI B16.11-1973
	Ring-Joint Gaskets and Grooves for Steel Pipe Flanges	ANSI B16.20-1973
	Nonmetallic Gaskets for Pipe Flanges	ANSI B16.21-1978
	Buttwelding Ends	ANSI B16.25-1978
	Wrought Steel Buttwelding Short Radius Elbows and Returns	ANSI B16.28-1964 (Rev. 1972)
	Refrigeration Flare Type Fittings	ANSI B76.1-1969
	Stainless Steel Buttwelding Fittings	MSS SP-43-1977
	Steel Pipeline Flanges	MSS SP-44-1972
	Large Diameter Carbon Steel Flanges	API 605-1980
	Standard for Steel Pipe Flanges	AWWA C207-1978
	BOLTING	
	Square and Hex Bolts and Screws, Including Askew Head Bolts, Hex Cap Screws and Lag Screws	ANSI B18.2.1-1972
	Square and Hex Nuts	ANSI B18.2.2-1972
	Socket Cap, Shoulder, and Set Screws	ANSI B18.3-1969
	THREADS	
	Unified Inch Screw Threads (UN and UNR Thread Form)	ANSI B1.1-1974
	Pipe Threads (Except Dryseal)	ANSI B2.1-1968
	Dryseal Pipe Threads	ANSI B2.2-1968
W77	**VALVES**	
	Steel Valves	ANSI B16.34-1977

NC-3133 Components Under External Pressure

NC-3133.1 General. Rules are given in this paragraph for determining the thickness under external pressure loading in spherical shells, cylindrical shells with or without stiffening rings, and tubular products consisting of pipes, tubes, and fittings. Charts for determining the stresses in shells and hemispherical heads are given in Appendix VII. For vessels designed to NC-3200, see NC-3240.

NC-3133.2 Nomenclature. The symbols used in this paragraph are defined as follows:

A = factor determined from Fig. VII-1100-1 in Appendix VII and used to enter the applicable material chart in Appendix VII. For the case of cylinders having D_o/T values less than 10, see NC-3133.3(b). Also, factor determined from the applicable chart in Appendix VII for the material used in a stiffening ring, corresponding to the factor B and the design metal temperature for the shell under consideration.

A_s = cross-sectional area of a stiffening ring, sq in.

B = factor determined from the applicable chart in Appendix VII for the material used in a shell or stiffening ring at the design metal temperature

D_o = outside diameter of the cylindrical shell course or tube under consideration, in.

E = modulus of elasticity of material at design temperature, psi (for this value, see Table I-6.0). Use the curve with this value on the material/temperature line of the applicable chart in Appendix VII.

I = available moment of inertia of the stiffening ring about its neutral axis, parallel to the axis of the shell, in.^{4} (mm^4) W78

I' = available moment of inertia of the combined ring-shell cross section about its neutral axis, parallel to the shell, in.^{4} (mm^4). The width of the shell which is taken as contributing to the combined moment of inertia shall not be greater than $1.10\sqrt{D_oT_s}$ and shall be taken W78

[illegible] Test Conditions. Testing shall be in accordance with NC-6000. Displacement loads shall not be [illegible]

(e) External Pressure Stress. Piping subject to external pressure shall meet the requirements of NC-3644.2.

(f) Allowable Stress Range for Expansion Stresses. The allowable stress range, S_A, is given by Eq. (1):

$$S_A = f(1.25\ S_c + 0.25\ S_h) \qquad (1)$$

where

S_c = basic material allowable stress at minimum (cold) temperature, psi

S_h = basic material allowable stress at maximum (hot) temperature, psi

f = stress range reduction factor for cyclic conditions for total number, N, of full temperature cycles over total number of years during which system is expected to be in service from Table NC-3611.2(c)-1

(1) In determining the basic material allowable stresses, S_c and S_h, joint efficiencies need not be applied.

(2) Stress reduction factors apply essentially to noncorrosive service and to corrosion resistant materials, where employed to minimize the reduction in cyclic life caused by corrosive action.

(3) If the range of temperature change varies, equivalent full temperature cycles may be computed as follows:

$$N = N_E + r_1^5 N_1 + r_2^5 N_2 + \cdots + r_n^5 N_n$$

where

N_E = number of cycles at run temperature change, ΔT_E, for which expansion stress, S_E, has been calculated

$N_1, N_2, \ldots N_n$ = number of cycles at lesser temperature changes, $\Delta T_1, \Delta T_2, \ldots \Delta T_n$

$r_1, r_2, \ldots r_n$ = $(\Delta T_1)/(\Delta T_E)$, $(\Delta T_2)/(\Delta T_E)$, $\ldots$ $(\Delta T_n)/(\Delta T_E)$

= the ratio of any lesser temperature cycles for which the expansion stress, S_L, has been calculated

(g) Allowable Stress for Nonrepeated Stresses. The allowable stress due to any single non-repeated anchor movement (e.g., predicted building settlement) calculated in accordance with Eq. (16a) of NC-3652.3(b) shall be 3.0 S_c.

NC-3612 Pressure-Temperature Ratings for Piping Products

NC-3612.1 Piping Products Having Specific Ratings.

(a) Pressure-temperature ratings for certain piping products have been established and are contained in some of the standards listed in Table NC-3132-1. The pressure ratings at the corresponding temperatures given in the standards listed in Table NC-3132-1 shall not be exceeded and piping products shall not be used at temperatures in excess of those given in Tables 1-7.0 for the materials of which the products are made.

(b) Where piping products have established pressure-temperature ratings which do not extend to the upper material temperature limits permitted by this Subsection, the pressure-temperature ratings between those established and the upper material temperature limit may be determined in accordance with the rules of this Subsection.

NC-3612.2 Piping Products Not Having Specific Ratings. Should it be desired to use methods of manufacture or design of piping products not now covered by this Subsection, it is intended that the manufacturer shall comply with the requirements of NC-3640 and NC-3690 and other applicable requirements of this Subsection for the Design Loadings involved. The manufacturer's recommended pressure ratings shall not be exceeded.

NC-3612.3 Considerations for Local Conditions and Transients

(a) Where piping systems operating at different pressures are connected by a valve or valves, the valve or valves shall be designed for the higher pressure system requirements of pressure and temperature. The lower pressure system shall be designed in accordance with (1), (2), and (3) below.

(1) The requirement of the higher pressure system shall be met.

(2) Pressure relief devices or safety valves shall be included to protect the lower pressure system in accordance with NC-7411.

(3) Assure compliance with all the conditions of (a) through (e) below.

(a) Redundant check or remote actuated valves shall be used in series at the interconnection, or a check in series with a remote actuated valve.

(b) Where mechanical or electrical controls are provided, redundant and diverse controls shall be installed which will prevent the interconnecting valves from opening when the pressure in the high

t_m = minimum required thickness, in.
t = pressure design thickness, calculated for the given closure shape and direction of loading using appropriate equations and procedures in NC-3000
A = sum of mechanical allowances (NC-3613)

(c) Connections to closures may be made by welding, extruding or threading. Connections to the closure shall be in accordance with the limitations provided in NC-3643 for branch connections. If the size of the opening is greater than one-half the inside diameter of the closure the opening shall be designed as a reducer in accordance with NC-3648.

(d) Other openings in closures shall be reinforced in accordance with the requirements of reinforcement for a branch connection. The total cross-sectional area required for reinforcement in any plane passing through the center of the opening and normal to the surface of the closure shall not be less than the quantity of $d_s t$, where

d_s = diameter of the finished opening
t = pressure design thickness for the closure, in.

NC-3647 Pressure Design of Flanged Joints and Blanks

878 **NC-3647.1 Flanged Joints**

(a) Flanged joints manufactured in accordance with the standards listed in Table NC-3132-1, as limited by NC-3612.1, shall be considered as meeting the requirements of NC-3646.

(b) Flanged joints not included in Table NC-3132-1 shall be designed in accordance with XI-3000.

NC-3647.2 Permanent Blanks. The minimum required thickness of permanent blanks (Fig. NC-3647.2-1) shall be calculated from the following equations

$$t_m = t + A$$

where

t_m = the minimum required thickness, in.
t = the pressure design thickness calculated from the equation below
A = the sum of the mechanical allowances, in. (NC-3613)

$$t = d_g \left(\frac{3P}{16S} \right)^{1/2}$$

where

d_g = the inside diameter of the gasket for raised or flat face flanges or the patch diameter of the gasket for retained gasketed flanges, in.
P = Design Pressure, psi
S = the allowable stress in accordance with Tables I-7.0

NC-3647.3 Temporary Blanks. Blanks to be used for test purposes only shall have a minimum thickness not less than the pressure design thickness, t, calculated as in NC-3647.2 above, except that P shall not be less than the test pressure and the allowable stress, S, may be taken as 95% of the specified minimum yield strength of the blank material (Tables I-7.0).

Task: Allegation or Concern No. 183

ATS No: RV84A004 BN No:

Characterization

Alleger use of hard drugs in portable toilets on site.

Implied Significance to Plant Design, Construction, or Operation

Assessment of Safety Significance

Staff Position

Sensitive

Action Required

H1525. 32B

Task: Allegation or Concern No. 183

ATS No: RV-84-A-0004 BN No:

Characterization

Alleged Drug Use.

Implied Significance to Plant Design, Construction, or Operation

Of concern is the measures that PG&E has taken to identify and curb suspected drug use and sale on site. Also of concern is the possibility that the judgement of those craft people or quality assurance inspectors suspected of drug use may have been impaired to affect the quality of safety-related work at the plant.

Assessment of Safety Significance

See Task Allegation or Concern No. 71

Staff Position

See Task Allegation or Concern No. 71

Action Required

See Task Allegation or Concern No. 71

H153 329

CHRIS
SORENSEN
5 PGS

WALTER B. SCOTT, P.E.
429 Gularte Road
Arroyo Grande, CA 93420

November 22, 1983

Secretary, Main Committee
ASME Boiler and Pressure Vessel Committee
American Society of Mechanical Engineers
United Engineering Center
345 East 47th Street
New York, New York 10017

Dear Mr. Secretary:

Please find attached three questions for interpretation of USA Standard B31.7-1969 Edition, "Nuclear Power Piping", with 1970 Addenda. Although this standard is old and not used for design of new piping systems, older installations were designed to these rules and ASME Section XI requires that consideration be given to the original design standard.

Thank you for your attention to these questions.

Sincerely,

Walter B Scott.

Walter B. Scott

WBS:ms

Attachment

H157 A 324

Problem Statement

Allegation No. 182

ATS No: RV-84-A-006

Allegation No.	Verbatim Statement or Reference
182	Bolts on the CVCS, RHR and RCS did not meet ASME code spec's. They were overtorqued. The PORVs and safeties were included in this problem. In fact, an engineer by the name of Walt Scott was moved out of an engineering position and into a warehousing position when he found this problem. The alleger indicated that this was hearsay.

Commentary

In conversation with Mr. Walt Scott, he added that improperly designed flanges were being used in Class 2 piping, and that some flange bolts had been overtorqued.

Date This Statement was Completed. MARCH 6, 1984

R C Arnold
Technical Reviewer Signature

H158

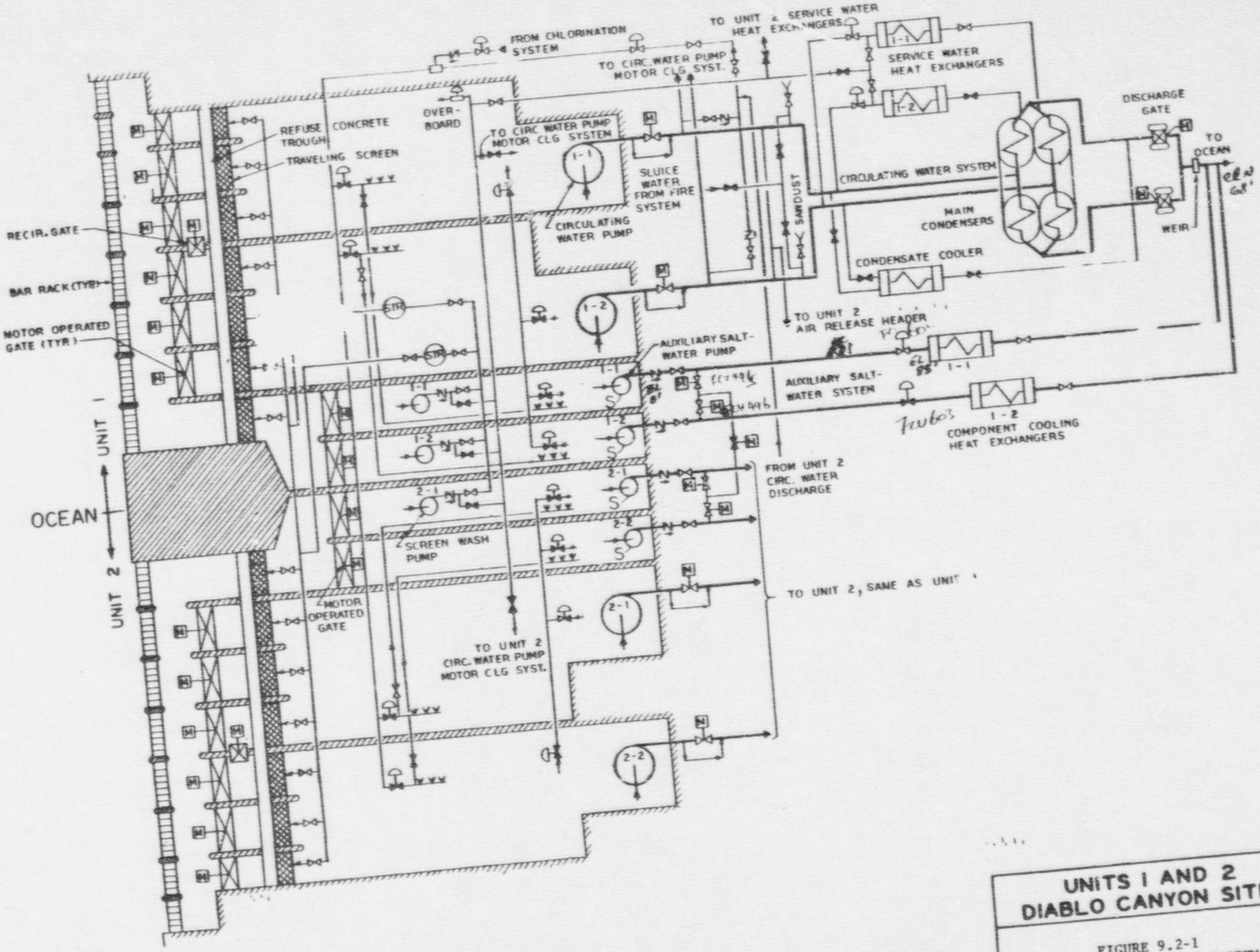
2/16/84 FROM SR. RESIDENT INSPECTOR

RV-84-A-006

Allgation # 181 - Poor, inaccurate and incomplete surveillance test records for diesel generator system exist at Diablo Canyon.

Findings - Discussions with the alleger revealed that the main concern of this allegation was that failures of the diesels to start were not properly being counted. Specific instances were where a plastic cover for air intake for painting protection caused a failure to start and where the exhaust caused the operators to terminate the test and these events were not considered failures of the diesel engines by the licensee and the allegation questions this decision. Regulatory Position C.2.e of Regulatory Guide 1.108 Revision 1, August 1977 is referenced in Technical Specification table 4.8-1 and established the requirements for determination of valid test failures and sucesses. Section C.2.e (2) of the referenced regulatory guide concludes that a "...malfunction of equipment that is not part of the defined diesel generator design should not be considered valid test or failures..." This section is interpreted to include such things as the plastic air intake cover and smoldering rags on the exhaust. Review of the licensees procedure for diesel testing found if acceptable per the requirements of the regulatory guide on this topic. Discussions with the alleger concluded that he agreed with this regulatory guide position and interpretation; therefore, the allegation is not substantiated.

H159 320



UNITS 1 AND 2
DIABLO CANYON SITE

FIGURE 9.2-1
AUXILIARY SALTWATER SYSTEM

Amendment 30 July 1975

Tech Spec

PLANT SYSTEMS

3/4.7.4 AUXILIARY SALTWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 At least two auxiliary saltwater trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one auxiliary saltwater train OPERABLE, restore at least two trains to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two auxiliary saltwater trains shall be demonstrated OPERABLE at least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to 1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the surveillance requirements are consistent with the assumptions used in the accident analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at 10°F and are sufficient to prevent brittle fracture.

3/4.7.3 VITAL COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the vital component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident analyses.

3/4.7.4 AUXILIARY SALTWATER SYSTEM

The OPERABILITY of the auxiliary saltwater system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

Tech Spec

PLANT SYSTEMS

3/4.7.3 VITAL COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1 At least two vital component cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one vital component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two vital component cooling water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a safety injection test signal or containment isolation phase B test signal, as appropriate.

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of off-site power.

Each electric driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 440 gpm at a pressure of 1135 psig to the entrance of the steam generators. The steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 880 gpm at a pressure of 1135 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available for cooldown of the Reactor Coolant System to less than 350°F in the event of a total loss of off-site power. The minimum water volume is sufficient to maintain the RCS at HOT STANDBY conditions for 8 hours with steam discharge to atmosphere.

The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant off-site radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

from 50-275/82-28

that the design change process has been expedited by the OSEG. Additionally, the limited design change authority for NPO will provide improved design change capability. This will be followed during normal inspector activities.

No items of noncompliance or deviations were identified.

17. Auxiliary Saltwater System (ASW) Pressure Transient

The licensee's resolution of LER 82-09 and unresolved item 82-29-01 identified a design change that added a vacuum breaker to the ASW (a check valve that vents). The vacuum relief was designed to prevent ASW pressure transients that were caused by water column separation on pump shutdown. The vertical height difference between the turbine building elevation and the intake structure induced backflow through the pump to the intake structure. This flow caused the vacuum and attendant pressure transient. The licensee has confirmed that temporary vacuum breakers have been installed and tested. The licensee plans to install permanent vacuum breakers that will be made of brass to better withstand the saltwater environment at the first refueling outage. This temporary modification is considered adequate to close the open item 82-29-01. To close LER 82-09, it remains for PSRC to review an engineering analysis on pipe structural capacity given the previous water hammer experience.

OK 2/14

No items of noncompliance or deviations were identified.

18. Exit Interview

An inspector, Mr. Mendonca, met with licensee representatives (denoted in paragraph 1) on September 2, 1983, and discussed the scope and findings of the inspection.

82-29-01 insp 1 rpt

f. [illegible]

g. Implementation of the licensee's physical security plan.

h. Plant housekeeping and cleanliness.

The inspectors talked with operators in the control room[illegible] plant personnel. The discussions centered on pertinent [illegible] relating to general plant conditions, procedures, security [illegible] and other topics related to the work activities involved.

The inspectors examined a licensee nonconformance report [illegible] DCO-82-MM-N059 Pressure Transient in ASW System, to verify [illegible] deficiencies were identified, tracked and resolved as specified [illegible] the NCR system. During ASW system operations, water hammer [illegible] (pressure spikes) were observed on ASW pump starts and stops. [illegible] nonconformance is to investigate the phenomenon and to [illegible] process (See paragraph 4, Surveillance, of this report for [illegible] information). This item will be examined during a future [illegible] (50-275/82-29-01).

No items of noncompliance or deviation was identified.

3. Maintenance

Maintenance activities for the diesel generators were [illegible] by the inspectors during the month. Observations by the inspectors [illegible] that proper approvals, system clearance and tests of redundant [illegible] were performed, as appropriate, prior to conducting maintenance on safety related systems or components. The inspectors verified that qualified personnel performed the maintenance using appropriate [illegible] procedures. Replacement parts were examined to determine that the proper certification of materials, workmanship and tests. [illegible] performance of maintenance activities, the inspectors verified [illegible] proper fire protection controls and housekeeping. Upon completion of the maintenance activity, the diesel generator was tested [illegible] returning the system or component to service (see paragraph [illegible] Surveillance).

No items of noncompliance or deviations were identified.

4. Surveillance

Surveillance testing on the diesel generator (Surveillance [illegible] Procedure M-9A) and the Auxiliary Saltwater System (Surveillance Procedure 17.8 Ad 2) were reviewed by the inspectors.

The diesel generator test was terminated due to high cooling water temperature. THe problem was believed to be caused by the ventilation paths to the radiator not being configured as designed (a roll down door was open). The licensee verified that with the door closed the diesel passed the test. The licensee plans a special test program to establish acceptable ventilation system configurations. This will be carried as an open item until the special test program is satisfactorily completed (50-275/82-29-02).

The auxiliary saltwater system test program was at the tsunami drawdown stage when indication of a potential pipe break (i.e., high pump motor amperage and reduced system flow) was observed. System hydrostatic tests and inspections were conducted to find the break, but no leakage was found. On retest, the system passed the tsunami drawdown test. This problem of potential pipe break indication is continuing and will be covered under the open item previously discussed in paragraph 2 (Operational Safety Verification) of this report (82-29-01).

No items of noncompliance or deviations were identified.

5. TMI Task Action Plan Items

a. Auxiliary Feedwater System Evaluation, Short Term Requirements (II.E.1.1)

The inspector verified that emergency operating procedures have provisions for transfer of pump suction to the fire water tank (safety grade) on loss of the Condensate Storage Tank (CST) level and that valve position is verified by two operators in accordance with a sealed valve checklist subsequent to testing or maintenance. This closes this item.

No items of noncompliance or deviations were identified.

b. Auxiliary Feedwater System (AFWS) Evaluation, Long Term Requirements (II.E.1.1)

The inspector verified that:

- CST level indication is redundant and safety grade
- AFWS flow is safety grade
- The AFWS suction valve position pointer has been replaced with a steel plate that was drilled and secured in place with a tack welded bolt. Additionally, this valve is on a sealed valve checklist

NRC FORM 366
(7-77)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

EXHIBIT A

CONTROL BLOCK: [ ] (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

[0 1] [C A D C P 1] (2) [0 0 0 0 0 0 0 0 0 0] (3) [4] [1 1 1 1 1] (4) [ ] (5)
LICENSEE CODE — LICENSE NUMBER — LICENSE TYPE — 57 CAT

CON'T

[0 1] REPORT SOURCE [L] (6) [0 5 0 0 0 2 7 5] (7) [1 0 0 7 8 2] (8) [1 0 1 8 8 2] (9)
DOCKET NUMBER — EVENT DATE — REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

[0 2] Prior to fuel load, testing performed on the Auxiliary Saltwater (ASW)
[0 3] system has revealed that the system is susceptible to water hammer effects
[0 4] during anticipated operational transients. These transients include pump
[0 5] trip and restart sequences such as would occur following a loss of offsite
[0 6] power. The peak pressure observed during this testing exceeded the 100
[0 7] psig system design pressure specified in the FSAR, however, no system
[0 8] degradation was observed which would have (Continued on attachment)

SYSTEM CODE [W B] (11) — CAUSE CODE [B] (12) — CAUSE SUBCODE [A] (13) — COMPONENT CODE [Z Z Z Z Z Z] (14) — COMP. SUBCODE [Z] (15) — VALVE SUBCODE [Z] (16)

(17) LER/RO REPORT NUMBER: EVENT YEAR [8 2] — SEQUENTIAL REPORT NO [0 0 9] — OCCURRENCE CODE [0 1] — REPORT TYPE [T] — REVISION NO [0]

ACTION TAKEN [F] (18) — FUTURE ACTION [F] (19) — EFFECT ON PLANT [Z] (20) — SHUTDOWN METHOD [Z] (21) — HOURS (22) [0 0 0 0] — ATTACHMENT SUBMITTED [Y] (23) — NPRD-4 FORM SUB [N] (24) — PRIME COMP SUPPLIER [Z] (25) — COMPONENT MANUFACTURER [Z 9 9 9] (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

[1 0] The cause of the system waterhammer is believed to be water column separ-
[1 1] ation and subsequent column recombination at a point of significant piping
[1 2] slope change. Further evaluation of the event and ASW system design is be-
[1 3] ing conducted. Results of the evaluation will be reported in a revision to
[1 4] this LER.

FACILITY STATUS [B] (28) — % POWER [0 0 0] (29) — OTHER STATUS (30) [NA] — METHOD OF DISCOVERY [C] (31) — DISCOVERY DESCRIPTION (32) [Testing Inspection]

[1 6] ACTIVITY RELEASED [Z] (33) — CONTENT OF RELEASE [Z] (34) — AMOUNT OF ACTIVITY (35) [NA] — LOCATION OF RELEASE (36) [NA]

PERSONNEL EXPOSURES — NUMBER [0 0 0] (37) — TYPE [Z] (38) — DESCRIPTION (39) [NA]

PERSONNEL INJURIES — NUMBER [0 0 0] (40) — DESCRIPTION (41) [NA]

LOSS OF OR DAMAGE TO FACILITY — TYPE [Z] (42) — DESCRIPTION [NA]

PUBLICITY — ISSUED [N] (44) — DESCRIPTION (45) [NA]

NRC USE ONLY

NAME OF PREPARER W. B. Kaefer — PHONE (805) 595-7351

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2pp.

Attachment to LER 82-009/01T-0

10. EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (Continued)

prevented the system from performing its intended function.

This event has in no way affected public health and safety and is reportable under Technical Specification 6.9.1.12.i

FILE COPY

Final
3-8-84

Task: Allegation or Concern No. 182

ATS No: RV-84-A-006 BN No:

Characterization:

Several alleged improprieties occurred at Diablo Canyon that are included in this allegation. Specifically:

1). Standard design flanges were used on Class 2 piping instead of flanges designed in accordance with Subdivision 1-704.5 of USAS B31.7-1969.

2). Bolts on flanges in the CVCS, RHR, and RCS systems did not meet ASME code specifications in that they were overtorqued. The PORVs and safety valves were included in this problem.

3). An engineer by the name of Walt Scott was moved out of an engineering position into a warehousing position for identifying these problems.

The alleger indicated he had heard these items but had no direct knowledge.

Implied Significance to Plant Design, Construction or Operation

Overtorqued bolts and use of improper flanges can affect the integrity of systems required to achieve and maintain safe shutdown of the plant.

H160 321

Assessment of Safety Significance

The staff addressed the allegation by interviewing Mr. Scott, reviewing the licensee's FSAR commitment to codes and standards, and reviewing the applicable code requirements. In addition, the Office of Nuclear Reactor Regulation (NRR) was consulted for their position concerning code requirements. The concerns will be addressed one at a time.

The interview with Mr. Walt Scott concluded that he had in fact identified these previously mentioned problems.

- One problem involves interpretation of USAS B31.7-1969, a standard that the licensee has commited to in their Final Safety Analysis Report. The above standard requires that flanges used in Class 2 piping be designed in accordance with Subdivision 1-704.5. The contention arises in that the licensee has used standard design flanges in accordance with Subdivision 1-704.7 of the above standard and USAS B16.5, vice Subdivision 1-704.5 as required. The licensee has verified this to be true, but considers that this is an alternate method deemed acceptable by USAS B31.7-1969.

  This topic was discussed with Bob Bosnak, Mark Hartzman and Frank Cherny of the Mechanical Engineering Branch in NRR and documented per telecon dated February 9, 1984. The issue was also raised with the same individuals per telecon on March 7, 1984. The staff concluded that the use of standard design flanges per Subdivision 1-704.7 is an acceptable alternative.

- Mr. Scott has pointed out that during assembly of flanges in the RHR system, bolts were torqued in excess of the code allowed yield strengths. This was done to assure firm seating of the flange gasket. However, this higher torque value did not exceed the actual yield strength of the bolts as determined from certified material tests that were corraborated by hardness tests.

  This issue was also discussed in a telecon with NRR on February 9, 1984, and again with the same individuals per telecon on March 7, 1984. The staff concluded, based on these discussions with the Mechanical Engineering Branch of NRR, that the torquing of bolts that exceeded code allowed yield strength, but not actual yield strength, is an acceptable approach allowed by USAS B31.7-1969.

  Mr. Scott indicated during the interview that he was independently pursuing this issue with the applicable ASME Code committee and will provide additional comments to NRC if he feels it necessary.

- In regard to the allegation that Mr. Scott was moved out of an engineering position for identifying these problems, an interview was conducted with Mr. Scott's former supervisor, as well as Mr. Scott, by the resident inspector, to determine its validity. Neither party confirmed the allegation.

Staff Position

1). Although the allegations concerning flange design and overtorquing of bolts are true, the staff found out these items had already been properly considered by the licensee. The staff considers this acceptably resolved.

2). The staff concludes that Mr. Walt Scott was not moved out of his engineering position into a scheduling position for identifying the above mentioned concerns, and therefore this allegation is unfounded.

Action Required

If the ASME code interpretation differs from NRR's evaluation, which is highly unlikely, the staff should reconsider the finding.

Task: Allegation or Concern No.177

ATS No: RV84A007 BN No:

Characterization

RHR pump suction line valve control. Potential damage to RHR pumps due to loss of suction as a result of a single failure.

Implied Significance to Plant Design, Construction, or Operation

Assessment of Safety Significance

Staff Position

Sensitive

Action Required

H161 366