

U. S. NUCLEAR REGULATORY COMMISSION
REGION V

Report Nos. 50-275/84-36 and 50-323/84-23

Docket Nos. 50-275 and 50-323

License No: DPR-76

Construction Permit No.: CPPR-69

Licensee: Pacific Gas and Electric Company
77 Beale Street, Room 1451
San Francisco, California 94106

Facility Name: Diablo Canyon Units 1 and 2

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

Inspectors: R. T. Dodds ----- 11/13/84
M. M. Mendonca, Sr. Resident Inspector Date Signed

M. L. Padovan ----- 11/13/84
M. L. Padovan, Resident Inspector Date Signed

T. M. Ross ----- 11/13/84
T. M. Ross, Resident Inspector Date Signed

T. J. Polich ----- 11/13/84
T. J. Polich, Resident Inspector Date Signed

A. Hon ----- 11/13/84
A. Hon, Reactor Inspector Date Signed

Approved by: R. T. Dodds ----- 11/13/84
R. T. Dodds, Section Chief Date Signed

Summary: Inspection from August 27, 1984, through October 26, 1984, (Report Nos. 50-275/84-36 and 50-323/84-23).

Areas Inspected: Routine followup of various allegations. This inspection involved 301 inspection hours by five inspectors.

Results: No violations or deviations were identified.

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DETAILS

1. Persons Contacted

Donald Rockwell, PG&E Special Projects Management
R. Keith Rhodes, PG&E PTGC I&C Lead Supervisor
James Miller, Bechtel PTGC Lead Weld Engineer
Harold Karner, Pullman QA/QC Manager
John Guiler, Pullman QA Auditor
Clyde Morton, Lawrence Livermore National Laboratory Inspector
Clyde Nicholes, Bechtel PTGC Engineer
Rick Brown, Foley Construction Engineer
Skip Moses, Foley Superintendent
Willain Hargrove, Foley Construction Foreman
*Dave Cosgrove, Bechtel QA Manager
Jim Dale, Foley Mechanical QC
Charlie Brown, Foley Mechanical QC
Charlie Braff, PG&E Special Projects Engineer
*Randy Cook, PG&E Special Projects Engineer
*Jim Bratton, PG&E Special Projects Engineer
Don Palmer, PG&E QC
Michael Green, Bechtel Material and Quality Services Engineer
Paul Brooks, Bechtel Material and Quality Services Engineer
William Shepperd, PG&E PTGC QA/QC Training Coordinator
Michael McCrae, Pullman QC Inspector
Adam Weinstein, Pullman Field Engineer
*Larry Rosetta, PG&E, Onsite Project Completion Manager
*Chris Neary, Pullman, QC NDE Supervisor
*Rick Wilson, Foley Quality Manager
*Deverne Dunnum, Foley QA
*Ron Hobgood, PG&E GC QC

Also in attendance was P. J. Morrill, NRC Project Inspector for Diablo Canyon.

*Denotes those attending the exit interview on October 26, 1984.

NOTE: The allegation characterization statements contained in this report are either a paraphrasing of the staff's understanding of the allegers concern or statements taken from the allegation source document. The characterization statements do not represent a staff assessment, conclusion or position.

2. Task: Allegation or Concern No. 1474

ATS No: RV-84-A-099

a. Characterization

A concern was raised that valves, which were removed from their installed position, were not properly stored. Specifically, the gallery area at approximately the 105 foot elevation of the south end of the Unit 2 turbine building, several valves were laying

directly on grating without dunnage. This work was reportedly performed by Bechtel construction forces and was contrary to the allegers understanding of the protection to be afforded these valves.

b. Implied Significance to Plant Design, Construction or Operation

These valves could be damaged by improper storage techniques, so that their function would be impaired.

c. Assessment of Safety Significance

The inspector toured the specific area referenced in the allegation. No valves were found in this area. Upon questioning Bechtel construction personnel in the area, the inspector was told that H. P. Foley personnel had removed several valves from the area earlier in the day.

Discussions with H. P. Foley personnel, who were involved in the movement of these valves, indicated that the valves were non-safety related class 2 flow control valves FCV-34, 35 and 36 which had been removed for flushing of the condensate system. The inspector had no reason to believe that the valves, alluded to in the allegation, were anything but class 2 components because that level of the turbine building contains mostly class 2 equipment, including a heavy concentration of condensate system (class 2) equipment.

The Foley procedure for storage of materials (QCP-4) was examined. This procedure does not require special handling or storage procedures for class 2 materials. Additionally, the inspector verified that this procedure requires appropriate handling and storage of class 1 (safety related) material.

The concern that Bechtel construction did not have appropriate instructions for storage of valves while under maintenance or repair activities was then examined. Bechtel's Field Procedure M-6 specified that "manufacturer's instructions, specifications and construction maintenance procedures" described proper storage requirements to prevent damage. Therefore, Bechtel construction forces do have general criteria for valve storage. The Bechtel construction Quality Assurance manager has instituted a program of inspections to assure that construction forces are properly implementing this guidance.

Finally, the inspector examined areas in the vicinity of the alleged improper storage for similar work activities. The inspector found that all observed valves (six valves were observed in response to this allegation) were properly stored on dunnage. Additionally, on routine plant tours by the resident inspectors, other storage and laydown areas, including those outside plant buildings, have been inspected. No deficiencies regarding laydown practices for valve storage were identified.

d. Staff Position

The staff concludes that (1) the valves in question were properly stored given their safety class, (2) Bechtel construction forces do have acceptable guidance for valve storage, and (3) construction work forces were implementing acceptable requirements for valve storage in the observed cases.

No violations or deviations were identified.

e. Action Required

None.

No violations or deviations were identified.

3. TASK: Allegation No. 226

ATS No: RV-84-A-052

a. Characterization

In two instances, safety related welds were removed (as a result of grinding to eliminate magnetic particle testing indications) without proper documentation to indicate that removal and repair of the welds were required.

b. Implied Significance to Plant Design, Construction or Operation

The weld magnetic particle testing certification and QC field documentation did not reflect the as installed weld condition.

c. Assessment of Safety Significance

These discrepancies were documented in Pullman Power Products Unscheduled Audit No. 32, dated August 3, 1982. Subsequently, Audit Action Request (AAR) No. 3 (to followup Audit No. 32) was issued, identifying the suspected cause of the discrepancies and recommending corrective action. AAR No. 3 indicated that a QC inspector had not identified on the weld process sheet that a weld needed repairs. The QC inspector apparently understood that new repair process sheets would be issued once the original process sheets were closed out, thus providing the required documentation. For corrective action, AAR No. 3 recommended that the weld conditions should be identified on QC comment sheets, and that the original process sheets should be marked to reference these comment sheets.

The "Corrective Action Taken" section of AAR No. 3 documented that the field QC comment sheets and the weld process sheets were corrected as recommended. Additionally, in reviewing the AAR, the staff noted that the allegor found the corrective action to be acceptable. Accordingly, this AAR was closed.

d. Staff Position

The staff finds that the alleged concern was previously identified during a Pullman audit, and was addressed and resolved in a responsible and satisfactory manner. The staff did not find any evidence to indicate that the alleged condition was anything other than an isolated instance.

e. Action Required

None.

No violations or deviations were identified.

4. Task: Allegation or Concern No. 262

ATS No. RV-84-A-052

a. Characterization

Pullman management instructs inspectors to violate contract specifications by stamping on the weld because it was not prohibited.

b. Implied Significance to Plant Design, Construction or Operation

Weld stamping on the weldment may inhibit visual examination and form sites for crack initiation.

c. Assessment of Safety Significance

During a routine QC walkdown, a contractor inspector observed one field weld with identification stamping on the weldment surface. Subsequently, a memo dated July 15, 1982 was sent to the Pullman QA/QC manager requesting clarification of weld stamping requirements. In a written response dated July 19, 1982 the QA/QC manager stated the weld was acceptable because stamping on the weld surface was not prohibited by the applicable Engineering Specification Diablo (ESD).

The inspector reviewed the American Welding Society (AWS) Code D1.1, applicable ESD's and PG&E specifications, the July 15 memo to the QA/QC manager, and the written response of July 19 to the QC inspector. Furthermore, interviews were conducted of several QC inspectors, the QA/QC manager, and the Pullman QA auditor.

The staff considers that the Pullman QA/QC manager's response did not instruct inspectors to violate contract specifications; further, that it was not the intent, of the memo, to instruct inspectors to violate contract specifications. PG&E contract specification 8833XR was the applicable controlling document for QC work referenced in the memo. ESD-243 "Pipe Rupture Restraints," had been derived from this specification to provide necessary amplifying instructions for implementation in the field. Neither the PG&E specification 8833XR nor ESD-243 mention any requirements for stamping adjacent to the weldment. Though the QC inspector states within the memo that

ESD-203/204 (Welding Stamping, Reinforcement, and undercutting) prescribes stamping adjacent to the weld, this ESD was related to PG&E contract specification 8711 (the piping and pipe support specification), not to the applicable specification 8833XR. Weld work related to EDS-243 and PG&E specification 8833XR did not prohibit identification stamping upon the weldment.

In the non-mandatory commentary of AWS D1.1 Section 6.5, "Die stamping of welds is not recommended since die stamp marks may form sites for crack initiation."

The NRC inspector was not able to locate the weldment which may have originally precipitated the contractor inspector's memo because the memo did not provide such specifics; nor did the allegation provide weldment specifics.

Within the memo of July 15, the QC inspector states stamping upon the weldment was assumed in the past to be an unacceptable practice. In truth, the practice of stamping upon the weldment is extremely rare at the Diablo Canyon site for the following basic reasons: 1) stamping on the weldment is generally understood, by welders and inspectors, to be an undesirable practice based upon their knowledge of specification 8711 (the piping and pipe support specification); 2) the base metal is much more accessible for stamping; and 3) recognition by welders and inspectors that weldment stamping may interfere with non-destructive examination. Interviews by the inspector with Pullman QC inspectors and QA personnel corroborated the aforementioned statements, and did not identify or indicate any other examples of stamping on the weldment surface. Furthermore, Lawrence Livermore Laboratory inspectors, who have performed independent onsite examinations of several thousand field welds, have not identified any instances of die stamp marks on weldment surface.

In conclusion, the inspector found no evidence of any pervasive problem associated with Pullman welds being stamped upon the weldment. The instance appears to be an extremely unusual occurrence which was not specifically prohibited by the applicable procedure and industry code.

d. Staff Position

Pullman's management response was appropriate and did not violate contract specifications. The staff concludes that the concern implied by the inspector's memo certainly does not represent a situation which occurred on any wide-spread basis; in fact the allegor, in his memo, did not identify any weld on which stamping occurred. The staff recognizes that stamping on structural steel weldments is discouraged but not prohibited by the Structural Welding Code; therefore, this does not represent a Code violation. This allegation is considered closed.

e. Action Required

None.

No violations or deviations were identified.

5. Task: Allegation or Concern No. 475

ATS No: RV-84-A-062

a. Characterization

Magnetic particle exams for a NDE Supervisor do not show his grade.

b. Implied Significance to Plant Design, Construction or Operation

The NDE supervisor may not be adequately qualified to perform NDE inspections or his assigned job functions.

c. Assessment of Safety Significance

This item was addressed by examining the NDE Supervisor's qualification record, answer keys for magnetic particle test (MT) examination, and applicable procedures and standards pertaining to the examination. Contrary to the allegor's concern, only a composite score is required by American Society for Nondestructive Testing (ASNT) No. SNT-TC-1A. Additionally, SNT-TC-1A requires qualification records to contain current copies of examinations, descriptions of practical test objects, and the specified percentile weight of each examination or practical test, all of which were contained in the NDE supervisor's qualification record. The NDE Supervisor had examination individual scores of 100% general, 86.63% specific, and 100% practical, for an overall composite score of 96%.

d. Staff Position

Although individual test scores were not listed in the NDE supervisor's qualification record, as stated by the allegor, these were not required and only a composite score was required. All other required information was available in the NDE supervisor's qualification record and a satisfactory composite score was obtained.

No violations or deviations were identified.

e. Action Required

None.

No violations or deviations were identified.

6. Task: Allegation or Concern No. 482

ATS No: RV-84-A-065

a. Characterization

Unqualified Brazing Procedure - Rebuttal to PG&E Statements

b. Implied Significance to Plant Design, Construction or Operation

Sleeve fittings brazed on small diameter stainless steel (SS) tubing may be unacceptable.

c. Assessment of Safety Significance

A scheduled review of brazing procedures by Foley QA personnel in September of 1981 identified a SS tubing brazing procedure which had not been qualified in all braze flow positions. Non-conformance report 8802-675 issued November 24, 1981 identified that Brazing Specification M004S listed all flow positions as qualified, whereas qualification records substantiated that only two flow positions (vertical down and horizontal) had been qualified.

ASME code, Section IX, requires qualification in three flow positions (vertical up, horizontal, and flat) in order to qualify a procedure for all positions. Disposition of NCR 8802-675 was completed in July of 1982. Corrective actions included qualifying Brazing Procedure Specification (BPS) 01 to allow brazing in all positions of flow and re-qualification of all existing brazers to BPS-01. The original brazing specification M004S was re-qualified and designated as BPS-01 without any change of the essential variables.

The concern of unqualified brazing procedure was originally addressed in an affidavit of H. R. Arnold, F. C. Breismeister, and R. K. Rhodes (dated March 16, 1984) as one of many replies to the intervenor's petition for re-opening the record on construction quality assurance. Attachment No. 2 of GAP letter dated April 12, 1984 (pages 7 and 8) rebutted the positions established in the affidavit. Subsequently, PG&E letter DCL-84-195 dated May 29, 1984 was issued in response to the GAP rebuttal.

The inspector has reviewed all the aforementioned GAP and PG&E documentation, ASME code Section IX, Brazing Specification M004S and BPS-01, NCR 8802-675, applicable Foley Quality Control Procedures (QCP), brazing procedure qualification tests, and brazer or brazing operator qualification tests. Interviews were conducted of involved Foley and PG&E General Construction (GC) personnel.

The deviation from ASME Section IX code requirements was determined by the inspector to be properly described and documented in NCR 8802-675. However, corrective actions taken to disposition NCR 8802-675 did not clearly address work performed with brazing specification M004S prior to 1981. Prior to 1981, brazing of sleeve fittings to SS tubing may have been performed in the vertical flow up position. This brazing procedure was used on class I small bore tubing used for instrument sensing lines, sample flow paths, etc.

After detailed examination of existing facts, the inspector has determined that, while the allegation was true the situation had

been previously identified by Foley, properly documented and responsibly dispositioned, and has minimal safety significance for the following reasons:

- 1) BPS-01 was qualified from M004S without any change of essential variables.
- 2) Existing brazers, previously qualified to M004S, were re-qualified to the BPS-01 procedure.
- 3) Safety-related small diameter SS tubing was hydrostatically tested in accordance with Foley QCP-3.
- 4) QC visual inspections of filler material flow were performed.

In addition, corollary issues associated with this allegation were concerned with documentation of brazer tests and results. Further investigation by the inspector verified that applicable testing and test results for brazers, required by ASME code Section IX, were documented and available for review.

d. Safety Significance

H. P. Foley identified the brazing procedure deficiency and took responsible corrective actions to assure continued acceptable brazing techniques and provide assurance that brazed joints, brazed in the up flow position, were acceptable. The fact that the procedure was not pre-qualified as required had minimal impact on brazing in the field and safety.

e. Action Required

None.

No violations or deviations were identified.

7. Task: Allegations Nos. 827 and 834

ATS No. RV-84-A-064

a. Characterization

Pullman Welding Procedure Specification (WPS) Code Number 7/8 was used to weld joint configurations which were not identified in WPS 7/8.

b. Implied Significance to Plant Design, Construction or Operation

The failure to meet stated weld codes, in the fabrication of pipe supports and pipe whip restraints, may result in components which would not be capable of performing their intended safety function.

c. Assessment of Safety Significance

These allegations are duplicates of Allegation No. 104. Attachment 4 of Supplement (SSER) No. 22 to the Diablo Canyon Safety Evaluation Report (NUREG-0675) addresses Allegation No. 104. On page A.4-103.2 of the supplement, Item 1(b) evaluates the use of WPS 7/8 for unidentified weld joint geometries, and concludes that no degredation of the welded components will result.

d. Staff Position

The staff finds that these allegations have been previously addressed and resolved as reflected in SSER No. 22.

e. Action Required

None.

No violations or deviations were identified.

8. Task: Allegation or Concern No. 991

ATS No.: RV-84-A-075

a. Characterization

Pullman Power Products (PPP) reconstructed the material requisition form for item 11 of Hanger 7411A without first documenting the deficiency (unit 1 VCT outlet).

b. Implied Significance to Plant Design, Construction or Operation

Potential loss of control of quality related documentation.

c. Assessment of Safety Significance

The inspector reviewed the subject field warehouse requisition form. This form was clearly marked as "reconstructed." The material on this form was verified by purchase order and heat number with a signature from a QC inspector on March 8, 1984. Controlling PPI procedure, ESD-254 (System Documentation Review), dated December 30, 1977, Section 2.2, required that "Missing or discrepant documentation shall be reviewed with the responsible persons; i.e. Field Inspectors, N.D.E. Technicians, etc. Corrections, if made, shall be initiated and dated by the responsible individual. If the discrepancies cannot be corrected through review with the responsible person, then a nonconformance, D.R., or Rejection Notice shall be initiated as applicable."

Further, ESD 215 requires the field QC inspector to verify material compliance with the field requisition form. ANSI N45.2.9-1974 (Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants) specifies in section 3.2.6 (Supplement Information to Quality Assurance Records) that, "Quality assurance records may be corrected or supplemented in accordance with procedures which provide for appropriate review or

approval by the originating organization. The correction or supplement shall include the date and the identification of the person authorized to issue such corrections or supplements."

Thus, the staff finds that the licensee's procedure is consistent with the industry standard and the reconstructed document was responsibly handled by Pullman.

d. Staff Position

The staff concludes that the reconstructed field warehouse requisition form, by a QC inspector, was dated and signed in accordance with the applicable procedure and standard. There was no apparent loss of control on quality related documentation.

e. Action Required

None.

No violations or deviations were identified.

9. Task: Allegation or Concern 990 and 992

ATS No. RV-84-A-075

a. Characterization

Hanger 7411A, in Unit 1, (Line 1-G2-41-4 Isometric 1-8-30) item 11 is not welded per design drawing requirements, and item 11 on drawing sheet 17 is not welded per the design drawing (see PO#9697 HT. No. AO 72803 FW).

b. Implied Significance to Plant Design, Construction or Operation

A failure to weld a component as required by design drawing may result in a safety system failure to perform as intended by the design.

c. Assessment of Safety Significance

A review of design drawing information indicates that these allegations address the same specific component. The alleged affected component is a shear sleeve.

The inspector examined the design drawings, field process sheets, as-built drawings and actual installation. From these examinations, the allegation appears to be based on the fact that the bottom surface of the shear sleeve was inaccessible for welding at portions of its circumference (this inaccessibility was due to interfering lugs). The records for this work showed that the inaccessibility was noted on working and as-built drawings. The work was completed on July 29, 1983 and Quality Control accepted August 6, 1983.

The Engineering Specifications Diablo (ESD) 223, in effect at that time, requires that (for inaccessible welds) "Inaccessible: when totally inaccessible weld areas are encountered, the Field Engineer shall indicate inaccessible welds on the Construction Drawing."

The inspector's examination verified that the total inaccessible length was noted on the construction drawing and accepted by project engineering on the as-built. Additionally, the staff's review of the documentation and installation of this hanger found that work was performed consistent with the requirements of the design drawing and applicable procedures and, further, the work was of good quality.

d. Staff Position

The documentation of the inaccessible weld was consistent with applicable procedural requirements and evaluated and accepted by Project Engineering. The work related to this hanger was of good quality and acceptably documented. Thus, the alleged condition had been previously identified and documented by the contractor and responsibly dispositioned by the licensee.

e. Action Required

None.

No violations or deviations were identified.

10. Task: Allegation or Concern No. 1118

ATS No: RV-84-A-064

a. Characterization

PG&E states "potential weld requirement misinterpretations were accounted for in the design process" which allegor feels is ludicrous.

b. Implied Significance to Plant Design, Construction or Operation

Craft interpretation of ambiguous weld symbology may result in unacceptable welds which are not accounted for in the design process.

c. Assessment of Safety Significance

PG&E letter DCL-84-40 (dated February 7, 1984) provided additional information requested by the NRC staff concerning the interpretation of weld symbols. The sentence "Also, potential weld requirement misinterpretations were accounted for in the design process" was lifted out of context from this letter and reprinted for rebuttal in Attachment 5 of GAP letter dated March 23, 1984.

The GAP letter rebuttal implied PG&E engineers were deliberately incorporating ambiguity into the design process. PG&E formally responded to the GAP rebuttal in DCL-84-243 (dated June 29, 1984).

Allegation No. 126 pertaining to weld symbology was considered to be resolved as stated by the staff in SSER 22. The staff noted that NRC inspections and reviews have not identified any instances where the failure by the licensee to fully implement the AWS A2 and weld symbology resulted in weldments which would not meet the designer's intentions. Further, the staff has found that implementation of AWS A2 was not a regulatory requirement or licensee commitment; therefore, implementation of AWS A2 was not a requirement.

The exchange of views between GAP and PG&E have diverged from the original subject of concern (weld symbology) without providing any substantive new information. GAP and PG&E letters did not establish any substantive new issues, nor provide any significant constructive argument to warrant reopening the allegations. The fundamental resolution regarding the use and interpretation of weld symbology by design and construction personnel remains unchanged. Ambiguity of weld symbology, and management's involvement therein, were topics addressed by the staff in SSER 22.

d. Staff Position

Allegation No. 1118 does not propose any significant issues which have not been previously addressed by the staff in Allegation No. 126, SSER 22.

e. Action Required

None.

No violations or deviations were identified.

11. Task: Allegation No. 464

ATS No: RV-84-A-062

a. Characterization

314 welds were inspected by one inspector utilizing the magnetic particle testing (MT) method. Of the 314 welds inspected, 145 were inspected on one day and 95 were inspected the second day. However, the maximum number of MT exams that an inspector generally performs in one day is about 50.

b. Implied Significance to Plant Design, Construction or Operation

Hurried MT examinations may result in a failure to identify unacceptable discontinuities in the weld metal or heat affected zone, which might prevent structures from performing their intended functions.

c. Assessment of Safety Significance

In order to obtain a perspective regarding the circumstances of the allegation, certain background information is necessary. A Pullman Discrepancy Report (NCR equivalent) No. 3295, Rev. 1, identified that about 1200 weld attachments were welded to rupture restraint structural members without application of the required preheat. These discrepancies were documented in the Pullman Power Products Discrepancy Report. The welds of concern were used to fasten temporary attachments (such as lifting eyes, shims and rod eyes) onto rupture restraints to aid in moving and aligning the restraints during installation. Subsequent to installation, almost all of the attachments were then removed, and the welds were ground out and painted over. In order to disposition the lack of preheat concern, MT was to be performed on certain welds and base metal locations.

In evaluating the feasibility of performing this many tests in a short period of time, the inspector verified that the number of remaining temporary attachments was generally small. The inspector also observed a test, utilizing the yoke MT method, to ascertain the time required for performing such examinations. The inspector determined that a large number of small welds could be magnetic particle tested in a short period of time, especially since the examinations were performed by an experienced and certified Level III nondestructive examination (NDE) technician. Additionally, the NRC inspector examined the locations of the restraints identified in DR 3295, and verified that the restraints were located within close proximity to each other, indicating that the technician would not have been required to move the MT equipment several times.

d. Staff Position

The staff finds that it was possible for the certified Level III NDE technician to have performed 145 magnetic particle tests in one day, considering the size and location of the subject welds. Thus, the conduct of 145 examinations in one day is not considered to be unreasonably high.

e. Action Required

None

No violations or deviations were identified.

12. Allegation or Concern No. 719 and 1116

a. Characterization

PG&E did not conduct comprehensive training sessions to clarify weld symbology.

b. Implied Significance to Plant Design, Construction or Operation

GAP rebuttal implies PG&E has made material false statements concerning weld symbology training conducted on-site.

c. Assesemnt of Safety Significance

PG&E letter DCL-84-40 (dated February 7, 1984) provided information to the NRC staff on the use and interpretation of weld symbols by design and construction personnel.

Under the subject of "Communication of Information" within letter DCL-84-40, PG&E stated "...Engineering and Construction have conducted meetings to discuss welds, and this program will continue to assure proper communication of weld symbol use and weld design. These sessions are comprehensive and widespread in that they are conducted with design engineers, field engineers, inspectors, contractor personnel." An example of the subject material used at these training sessions was enclosed within attachment 3 of this letter.

Within Attachment 5 of the March 23, 1984 GAP letter, the PG&E position concerning weld symbology training sessions was refuted as "false or at least overwhelmingly misleading." The GAP author suggests either such sessions did not occur as described, or certainly were not comprehensive and widespread.

PG&E has subsequently addressed GAP's rebuttal in letter DCL-84-243 (dated June 29, 1984). In this response more specific information concerning jobsite training programs regarding weld symbols was provided (i.e. quantity and type of personnel attendance, times, and training material). PG&E had previously described on-site weld symbology training sessions within letter DCL-84-166 (dated April 30, 1984) in response to Allegations in the GAP petition dated March 1, 1984.

The inspector has reviewed all aforementioned GAP and PG&E documentation. Appropriate training session agendas, attendance records, and course handout materials were also examined. On-site correspondence associated with the scheduling and notification of training sessions were reviewed by the inspector, including documented trip reports written by the applicable instructors. Futhermore, the following personnel were interviewed: 1) training instructors from the Bechtel Materials and Quality Services (M&QS) department, 2) on-site QA/QC training coordinator, 3) lead GC welding engineer, and 4) a dozen randomly selected attendees from PPP, PG&E, and Bechtel.

After a detailed evaluation of the information identified above, the inspector has determined that many training sessions pertaining to weld symbology have been conducted on-site. Discussion with responsible personnel indicate that the attendance figures reported by the licensee were based upon numbers provided in the instructors trip reports. The following is a chronology of on-site training programs sponsored by PG&E which have addressed weld symbology.

Unless otherwise specified, attendance figures are based upon available attendance sheet records.

- 1) Two redundant four hour training sessions on "Weld Inspection and Symbols" were held May 11 and 12 of 1983 for a total of at least 130 PG&E and Bechtel engineers. Instructor trip reports indicate that 200 were in attendance.
- 2) AWS pre-certification program for certified welding inspector training (CWI) was conducted June 20 thru July 1 of 1983 for 27 PG&E and Bechtel engineers. Instructor trip reports indicate that 30 were in attendance.
- 3) "Welding and Non-Destructive Examination Symbols" training was conducted in four hour repetitive sessions on June 20 thru 23, and June 27 thru 30 for a total of at least 85 PPP, PG&E, and Bechtel engineers. Instructor trip reports indicate that 150 were in attendance.
- 4) AWS pre-certification program for CWI training was conducted from November 28 thru December 9 of 1983 for 61 PPP and Foley inspectors and PG&E and Bechtel engineers.
- 5) "AWS Weld Symbology" training was conducted in two repetitive two hour sessions for 30 PG&E and Bechtel civil engineers. The on-site lead weld engineer held these sessions on January 25 and 26, 1984.

All identified training, except item 5), was performed by instructors from M&QS in accordance with the guidelines prescribed in the AWS code. Classes held in January were taught by the GC lead welding engineer. Training sessions 1), 3), and 5) addressed weld symbol requirements of AWS code A2.4, exclusively; whereas, the AWS pre-certification courses encompassed a broad spectrum of the AWS code (including A2.4). The staff does not find that the apparent discrepancies in attendance figures, provided by available attendance sheets and the instructor trip reports, are material or significant. There was no requirement to obtain or maintain attendance sheets. Due to the incomplete condition of available attendance records, several additional dates of probable training sessions could not be located. It should also be noted that PPP has conducted internal training on weld symbols for both inspectors and engineers in addition to the sessions sponsored by PG&E.

In conclusion, the inspector concludes the PG&E statements (that comprehensive weld symbol training has occurred on-site and that the training sessions were attended by a widespread distribution of contractor, GC, and on-site project engineering group (OPEG) personnel) were based on fact and that the PG&E statements do not misrepresent the facts.

d. Staff Position

The staff verified that comprehensive training sessions, in accordance with AWS code, were conducted to clarify interpretation and understanding of weld symbology for a large, widespread segment of on-site field engineers, design engineers, and inspectors.

e. Action Required

None.

No violations or deviations were identified.

13. Task: Allegation or Concern No. 1412

ATS No: RV-84-A084

a. Characterization

Pullman Power Products (PPP) bolt torquing procedure ESD-238 listed the initial torque value and the allowable stress. However, this procedure allowed for increased torque, up to twice the initial torque, as necessary, to seal the joint. The allegor raised the following three concerns related to the increased torque allowance:

- 1) Through his own calculation, the allegor showed that the increased torque could cause the allowable stress of the bolt to be exceeded.
- 2) There was no correlation between the torque value and the maximum allowable stress listed in the procedure.
- 3) The increased torque could overstress the gasket material.

b. Implied Significance to Plant Design, Construction or Operation.

Over-torqued bolts could affect the integrity of systems required to achieve and maintain the designed safety functions.

c. Assessment of Safety Significance

The staff addressed this allegation by reviewing the subject procedure, related industry standard and practice, bolting material specifications, and interview of licensee engineers.

The three concerns raised are addressed as follow:

- 1) Over-torquing of bolts - this issue was already addressed in Allegation No. 182 (SSER No. 22). The staff again confirmed that while increased torque up to twice the initial torque may stress the bolts above the allowable stress values listed in the procedure, the actual yield strength of the bolts was not exceeded. The bolting material specification (1980 Annual Book of ASTM Standards, Part 1) shows that the yield strength of A193 Grade B7 and B8 bolts are significantly higher than the stress produced by twice the initial torque value.

The ASME Boiler and Pressure Vessel Code, Division 1 Appendices, Article XII-1000 (Design Considerations for Bolted Flange Connections) provides allowance for initial bolt stress higher than the allowable stress. Thus, this does not represent a Code violation.

- 2) Though not mentioned explicitly in the subject procedure, the bolt torque values and the stress values were correlated by adopting the Crane Bolting Standard. This standard reflects the results of many Crane tests to determine the relation between torque and bolt stress. It is a common industrial practice to use this standard. Furthermore, as indicated in 1) above, the actual yield stress was not exceeded.
- 3) The gaskets used were the Flexitallic type. This type of gasket has built-in centering rings for the purpose of positioning the gasket. The centering rings are made of stainless steel type hard material. Thus, the centering rings would prevent overstressing of the gasket material by acting as a compression stop.

d. Staff Position

Based on the above safety assessment, the staff concluded that the concerns raised by this allegation do not represent a significant safety concern or adversely impact safe operation of the plant.

e. Action Required

None.

No violations or deviations were identified.

14. Task: Allegation or Concern No. 1413

ATS No: RV-84-A-0084

a. Characterization

The allegor noted A307, Grade B bolting material was used on Class C flanges by Pullman Power Products (PPP). He questioned whether this was a nonconformance, because he could not confirm that A307 bolting was specified by PPP Bolting Procedure ESD-238 or the design rule of ANSI B31.7-69. PPP responded that the code allowed A307 Grade B bolts for Class C application. The allegor was unconvinced and made this allegation that no clear procedure or specification allowed for the use of A307 Grade B bolting material.

b. Implied Significance to Plant Design, Construction or Operation.

Using bolting materials not specified by codes could result in piping installations which would not conform to the design intent.

c. Assessment of Safety Significance

The staff addressed this allegation by interviewing PPP QA Manager, reviewing applicable code requirements and other related documents to determine if A307 Grade B bolting material was used per licensee's specification and if this use was allowed by the Code. PPP's torquing procedure ESD-238 did not specifically provide for the use of A307 bolts. However, torquing process sheets were prepared to meet PG&E specification "K12", which specified bolts to be carbon steel ASTM A307, Grade B and the design condition to be 400 degrees F. Thus, the usage of A307 bolts was in accordance with PG&E's specification.

PG&E committed to follow ANSI B31.1 and B31.7 for pipe supports in its specification 8711 "Erecting Main System Piping and Furnishing, Fabricating, and Erecting Balance of the Plant Piping (Units 1 and 2)." PG&E adopted the ASME Boiler Code Nuclear Class III for PG&E Code Class C piping work. From reviewing the related ASME and ANSI codes, the staff found that A307, Grade B bolts were allowed in the following two ways:

- 1) ASME Boiler and Pressure Vessel Code Section III, ND-2128 "Bolting Material" lists A307, Grade B bolting material for applications below 450 degrees F. In ANSI code Case 115, the Code Committee accepted ASME Section III as complying with the requirements of B31.7-69. Thus, A307, Grade B bolts met the requirement of B31.7-69.
- 2) ANSI B31.1 Chapter II, Paragraph 108.5.2 listed A307 bolts for applications below 400 degrees F. The design rule B31.7 for Class III piping application is Chapter 3-II Part 3, which stated that "Selection and limitation of piping components shall be in accordance with Chapter II, Part 3 of USAS (now ANSI) B31.1.0." Again, A307 Grade B bolts met the requirement of B31.7-69.

d. Staff Position

The codes and the licensee's specification clearly allowed the use of A307 Grade B bolting material for Class III piping applications below 400 degrees F.

e. Action Required

None.

No violations or deviations were identified.

15. Exit Interview

On October 26, 1984, an exit meeting was conducted with the licensee's representatives identified in paragraph 1. The inspectors summarized the scope and findings of this inspection as described in this report.