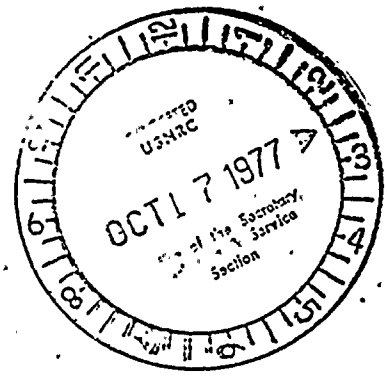
UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555



October 14, 1977

Elizabeth S. Bowers, Esq., Chairman
Atomic Safety and Licensing Board Panel
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

In the Matter of
Pacific Gas and Electric Company
(Diablo Canyon Nuclear Power Plant, Units Nos. 1 and 2)
Docket Nos. 50-275 O.L. and 50-323 O.L.

Dear Mrs. Bowers:

Enclosed for your information is a copy of the GAO report of the inspection conducted by that agency of the Diablo Canyon Plant the week of June 6, 1977, together with a transmittal letter dated July 22, 1977 from Solon P. Darnell to R. H. Engelken, Director of the NRC's Region V. Also enclosed for your information is a copy of the August 23, 1977 NRC report on the GAO items and other quality assurance matters.

In addition to the items of concern identified by the GAO in their letter of July 22, 1977, GAO representatives informally advised the Director, Region V, and the members of his staff on October 6, 1977, of a number of other observations or comments made by the audit team during their audit of the NRC inspection program at the Diablo Canyon site during the week of June 6, 1977. Some of these observations appeared to relate to the licensee's quality assurance program and will be investigated during NRC inspections in the near future. Documentation of these matters will be included in routine inspection reports which will be avilable to the parties.

Sincerely,

L. Dow Davis
Counsel for NRC Staff

Enclosures as stated

cc See Page 2

cc (w/ encl.):

Mr. Glenn O. Bright
Dr. William E. Martin
Philip A. Crane, Jr., Esq.
Mrs. Elizabeth Apfelberg
Mrs. Raye Fleming
Mr. Frederick Eissler
Mrs. Sandra A. Silver
Mr. Gordon Silver
Mr. William P. Cornwell
Paul C. Valentine, Esq.
Yale I. Jones, Esq.
Brent Rushforth, Esq.
Michael R. Klein, Esq.
David F. Fleischaker, Esq.
Arthur C. Gehr, Esq.
Janice E. Kerr, Esq.
Mr. James O. Schuyler
Bruce Norton, Esq.
Atomic Safety and Licensing Board Panel
Atomic Safety and Licensing Appeal Panel
Docketing and Service Section

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

AUG 23 1977

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: Investigation - Pacific Gas and Electric Company
Diablo Canyon Units 1 and 2

This refers to the investigation conducted by Mr. D. F. Kirsch of this office during the period of July 11 to August 3, 1977 of activities authorized by NRC Construction Permit Nos. CPPR-39 and CPPR-69 and to the discussion of our findings with Mr. M. R. Tressler and other members of your staff at the conclusion of the investigation.

Areas examined during this investigation dealt with safety concerns identified by the General Accounting Office (GAO) during an audit they conducted at the Diablo Canyon facilities between May 30 and June 10, 1977. In addition, interviews with personnel, identified by the GAO, resulted in specific allegations regarding workmanship which were likewise examined during the investigation.

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

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 identified is contained in an enclosure to the application, since the application without the enclosure will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

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

Sincerely,

G S Spencer

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

Enclosures:
1. Appendix A - Notice of Violation
2. Investigation Report No.
50-275/77-17, 50-323/77-07

cc w/o Enclosure #2:
R. P. Wischow, PG&E
J. D. Worthington, PG&E

APPENDIX A

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

Docket No. 50-275
Construction Permit No. CPPR-39

NOTICE OF VIOLATION

Based on the results of NRC investigation conducted during the period from July 11, 1977 to August 3, 1977, it appears that one of your activities was not conducted in full compliance with NRC requirements as indicated below.

A. 10 CFR 50, Appendix B, Criterion V, and the FSAR, Section 17.1.5, requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

M. W. Kellogg Engineering Specification No. ESD-243 ("Pipe Rupture Restraints") requires that inspections be performed to verify fitup, preheat temperature, root pass, weld completion and final visual examination and further requires that all operations be documented on a pipe restraint process sheet.

Contrary to the above requirements:

1. Field weld FW-40 of restraint number Bent 9 (Drawing No. 1000111) had not been inspected, as required, at the time of root pass completion as evidenced by "NA" entered in the appropriate block of the restraint process sheet.

2. The final visual inspections of field weld numbers FW-22A, 22B, 23A, 23B, 23C, 24A, 24B, 24C, 29A, 29B, 30A, 30B, 31 and 32, of restraint number Bent 9B (Drawing No. 1000111), had not been performed, as required, as evidenced by the entry "NA" in the final visual block of the associated restraint process sheets.

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

REGION V

Report No. 50-275/77-17
50-323/77-07

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

Licensee: Pacific Gas and Electric Company

77 Beale Street

San Francisco, California 94106

Facility Name: Diablo Canyon Unit Nos. 1 and 2

Investigation at: Diablo Canyon Site, San Luis Obispo County, Calif. & Corporate Office

Investigation conducted: July 11-14, 25, 29 and August 2-3, 1977

Inspectors: D. F. Kirsch, Reactor Inspector — 8/17/77 Date Signed

Date Signed

Date Signed

Approved by: G. S. Spencer, Chief, Reactor Construction and Engineering Support Branch — 8/17/77 Date Signed

Summary:

Investigation on July 11-14, 25, 29 and August 2-3, 1977 (Report Nos. 50-275/77-17 and 50-323/77-07)

Areas Investigated: Examined bases for safety concerns identified by an on-site General Accounting Office (GAO) audit and GAO identified individuals regarding (a) pipeway welding quality and structural steel installation; (b) seismic and pipe whip restraint installation; (c) adequacy of concrete anchor bolt testing; and (d) resin filter trap welding quality. The investigation consisted of 42 on-site manhours and 3 off-site manhours by one inspector.

Results: Of the four areas investigated, no items of noncompliance or deviations were found in three areas; one apparent item of noncompliance relating to Unit No. 1 was found in one area (Infraction - Failure to follow inspection and recordkeeping procedure - Paragraph 3.c.(1)(b)). No items of noncompliance or deviations were found relating to Unit No. 2.

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

REGION V

Report No. 50-275/77-17
50-323/77-07

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

Licensee: Pacific Gas and Electric Company

77 Beale Street

San Francisco, California 94106

Facility Name: Diablo Canyon Unit Nos. 1 and 2

Investigation at: Diablo Canyon Site, San Luis Obispo County, Calif. & Corporate Office

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DETAILS

1. Individuals Contacted

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

   *R. Tressler, Project Superintendent
   *R. D. Etzler, Mechanical Resident Engineer
   *F. M. Russell, Acting Civil Resident Engineer
   *C. M. Seward, QA Engineer
   *D. Day, Coordinating QC Engineer
   *V. L. Killpack, QA Engineer
   R. Torstrom, Inspector
   J. Holley, Lead Inspector - Mechanical
   J. Nystrom, Inspector - Mechanical
   C. Braff, Engineer
   D. L. Polley, Assistant to Project Engineer
   E. P. Wollack, Supervising Civil Engineer
   S. Hanusiak, Civil Engineer

   *Denotes those attending exit interview.

   b. M. W. Kellogg Company (Kellogg)

   J. P. Runyon, QA Manager
   J. P. Watson, Auditor

   c. General Accounting Office (GAO)

   P. Latourney, Auditor

   d. Robert McMullin and Son

   W. Bartlett, Superintendent

   e. Others

   Individual A - alleger providing details regarding the General Accounting Office (GAO) findings of out-of-level structural supports, pipe rack out-of-square and poor quality welding on Unit No. 2 pipe rack.

   Individual B - alleger providing details regarding the GAO finding of "sloppy work on Unit No. 2 pipe restraints."

   Individual C - individual providing details of alleged improper work practices on Unit No. 1 seismic limiter installations.

2. Background

The General Accounting Office conducted an audit of the NRC inspection program at the Diablo Canyon facilities during the weeks of May 30 and June 6, 1977, and conducted interviews with numerous craftsmen engaged in safety related work. Pursuant to this audit, the GAO notified Region V of the audit items of concern on June 24, 1977 by telephone and by letter on July 22, 1977. These items of concern identified allegations of improper workmanship at the Diablo Canyon facilities. Conversations with the GAO identified three individuals, referred to herein as Individuals A, B and C, who provided specifics with regard to the GAO findings. A Region V inspector was dispatched to the site during the week of July 11, 1977 to interview the Individuals A, B and C and investigate the GAO findings of improper workmanship.

3. General Accounting Office Audit-Items of Concern

a. "Improper installation of pipe hangers, pipe racks and seismic limiters."

Clarification of specifics regarding the above concern was provided by Individual C. Allegations made by Individual C, which apply only to ITT Grinnell seismic limiters, and the associated NRC findings are itemized below. Although certain of the individual allegations by C were verified as existing conditions, C did not allege that corrective action had not been taken.

The Region V staff has been following the hydraulic seismic limiter inspection, test and repair program since December 1976. The documentation of details concerning hydraulic seismic limiters have been provided in IE Inspection Report Nos. 50-323/76-05, 77-01, 77-03, 77-06 and 50-275/77-03 and 77-11.

(1) Allegation: No receiving inspections are performed on seismic limiters.

NRC Finding: The allegation was not substantiated. While seismic limiters were not required by procedure to be receipt inspected by Quality Control at the site, receipt inspections were performed by the Kellogg Engineering staff. Evidence presented in support of this finding consisted of shipping invoices with items checked off and documents showing that seismic limiters, which arrived at the site and did not correspond to

size requirements listed on the invoice, were returned to the manufacturer. The licensee and Kellogg have prepared a new engineering specification for receiving, inspection and storage of hanger and rupture restraint materials for inclusion in the Kellogg engineering specification manual.

The inspector examined the seismic limiter storage area and noted that storage conditions appeared to correspond to the requirements of Kellogg Procedure No. ESD-259 ("Installation and Modification Procedure for Grinnell Snubbers").

(2) Allegation: The fluid is being reused, following seismic limiter overhaul, after being filtered through a gasoline filter, contrary to manufacturer's recommendations.

NRC Finding: The allegation was not substantiated. The manufacturer of the seismic limiters in question did state, in a mailgram of April 4, 1977, that if the fluid is adequately filtered, the fluid could be reused. The minutes of a meeting on May 12, 1977, between the staff of Kellogg, PG&E and ITT Grinnell, disclosed that ITT Grinnell representatives stated that a 40 micron filter would provide adequate filtration to allow reuse of the fluid. The licensee showed that a five micron filter is installed, exceeding the manufacturer's recommendations.

(3) Allegation: Sedimentary particles can be seen in the reservoirs of some snubbers installed on the Unit No. 1 pipe rack.

NRC Finding: The allegation was not substantiated. The NRC inspector examined ten installed seismic limiters and noted no visible particles in the reservoirs.

(4) Allegation: The vent plugs on seismic limiters are constructed so as to allow the fluid to be contaminated with dirt and water.

NRC Finding: The allegation was substantiated. The licensee had previously recognized this potential problem and stated that filtered vent plugs had been ordered from ITT Grinnell for replacement on the installed units.

(5) Allegation: The shaft of installed snubbers can corrode and pit by being exposed to the environment and result in snubber inoperability.

NRC Finding: The allegation was substantiated. The licensee had previously recognized this potential problem and had identified the problem on Discrepancy Report No. 3394. Licensee personnel stated that the Discrepancy Report had not yet been resolved.

(6) Allegation: The hot piston travel over-extends the travel on some seismic limiters to an out-of-tolerance condition.

NRC Finding: The allegation was substantiated. Licensee personnel identified this condition and referred resolution to the Engineering Department on May 24, 1977. The cause of the problem was a misprinted dimension, in the ITT Grinnell catalog, for snubbers of sizes 1½" x 5" and 1½" x 10." The licensee had written Discrepancy Report No. M-3445 on June 2, 1977, which documents the condition and specifies that design drawings utilizing the snubbers in question be reviewed and corrective actions specified, as required. The review of the design drawings had not yet been completed. In addition, licensee representatives stated that Kellogg personnel had standing orders to identify any installations, where movement is out-of-tolerance, for resolution.

(7) Allegation: Spherical joints and grease fittings were painted in many cases. Although the overhaul program has eliminated this condition, subsequent repainting could foul the spherical joints.

NRC Finding: The allegation was substantiated. The condition of painted shafts, grease fittings and spherical joints was identified by Minor Variation Report (MVR) No. 3378. Corrective actions to this MVR specified that a 100% test and repair program be conducted for all installed ITT Grinnell snubbers. This program is in the final phases of completion. Interviews with the painting contractor superintendent and licensee representatives disclosed that adequate precautions have been taken to preclude recurrence.

(8) Allegation: Seismic limiter shafts, in some instances, bind on the pipe clamp causing the shafts to bend.

NRC Finding: The allegation was not substantiated. Licensee representatives stated that only two shafts had been bent and that the cause was personnel stepping on the snubber, not due to clamp binding. The licensee had previously identified this potential problem and had written a letter proposing clamp modifications to preclude occurrence of the condition. Licensee personnel stated that if the investigation determines the existence of a problem in this area a Minor Variation Report would be written and identification made of those clamps which require modification.

(9) Allegation: Spherical joints on seismic limiters are not greased at installation.

NRC Finding: The allegation was substantiated. The ITT Grinnell procedure does not require joint lubrication on installation because the joints are factory lubricated. The spherical joints of overhauled snubbers are greased during overhaul and, therefore, would not require lubrication on reinstallation. It was noted that use of the present Kellogg lubrication procedures precludes lubrication of those spherical joints attached to snubber extensions, and licensee personnel stated that this oversight would be corrected by a proposed Kellogg procedure revision.

ITT Grinnell maintenance instructions and letter of July 22, 1977 to Pullman Power Products (Kellogg) recommend lubrication of the spherical bushings periodically if the spherical bearings had been lubricated in the past. The licensee procedures appeared to adequately implement this recommendation.

It was noted that snubber no. 1032-12SL, on Unit No. 1 pipe rack, had an extension spherical joint with no grease fitting. Licensee personnel stated that the snubber would be lubricated.

(10) Allegation: Seismic limiters in excess of a certain size were never overhauled and tested.

NRC Finding: The allegation was substantiated. The licensee stated that the bleed rate and lockup test apparatus in use at the site is not sufficient to test size no. 8 snubbers, of which only two are required for Unit No. 1. Licensee representatives noted

that the two no. 8 snubbers would be removed and tested by a manual method for air entrapment and if the snubber does not pass the air test it would be returned to ITT Grinnell for repair and factory recalibration.

(11) Allegation: When the seismic limiter fluid is heated, lockup and bleed rate accelerations change such that manufacturer's specifications are no longer met.

NRC Finding: The allegation was substantiated; however, Minor Variation Report (MVR) No. 3513 was written on July 13, 1977 documenting the problem prior to inquiry by the inspector. This MVR specifies that additional testing be performed on site and the temperature affects on lockup and bleed rate specifications be evaluated by the Engineering Department.

The fact that temperature change adversely affects lockup and bleed rate had been identified previously and is currently being pursued as a generic issue by ITT Grinnell and the NRC staff.

b. "During the installation of pipe hangers and racks, anchor bolts were cut short or omitted to avoid drilling rebar or resetting the hangers or racks. The licensee's program for inspection, testing and repair of pipe hangers, pipe racks and seismic limiters will neither detect or correct this problem."

NRC Finding: The allegation was not substantiated. The licensee determined that some concrete expansion anchors were improperly installed and initiated a major reinspection of completed pipe hangers and concrete expansion anchors. The NRC has been cognizant of the licensee's program of reinspection, testing and repair of concrete expansion anchors since the program inception. The NRC findings in this regard are documented in IE Inspection Report Nos. 50-275/76-14, 77-03, 77-11 and Nos. 50-323/76-05, 77-01, 77-03, and 77-06.

The investigator re-examined the licensee's "Procedure for Establishing Acceptance Criteria for Concrete Anchor Installations" and the Pullman Power Products QA Instruction No. 98 ("Procedure for Inspection of Existing Concrete Expansion Anchors in Hanger Installation"). The utilization of the above test and inspection methods adequately provide for detection and correction of concrete expansion anchors which are omitted or shortened by cutting either the plug or threaded end of the expansion anchor.

c. "The prefab welds on the seismic restraints in Unit No. 1 are of poor quality."

"In Unit No. 2, elevation 132½, the pipe rack welding is of poor quality. The iron weld was neither preheated or stress relieved."

"In Unit No. 2, elevation 126-127, there has been sloppy work performed on the pipe restraints."

This is a consolidation of three GAO items of concern so as to preclude repetition of NRC findings.

Discussions with Individuals A and B were held to determine specifics regarding the general items of concern. Individuals A and B stated that the general items of concern were applicable to the pipeways of both Unit Nos. 1 and 2 and made certain general and specific allegations, regarding workmanship on the pipeways, which are addressed below.

Individual B expressed concern that the engineering structural analysis for the Unit No. 1 pipe rack did not include analyses for the additional weight of pipe rupture restraints and hangers which were added after the original construction drawings were released for construction. Investigation disclosed that the original pipeway structural evaluation report was issued in 1974 and that a revised evaluation was issued in April 1977. The Nuclear Services Corporation Report No. PGE-01-28, Revision 1 of April 11, 1977 ("Structural Evaluation of Postulated Pipe Break Outside Containment at Diablo Canyon Unit 1") was examined and noted to contain a finite element analysis of the pipeway taking into account the additional loads imposed by the additional hangers and pipe rupture restraints. The report concluded that no unacceptable structural damage would result from the predicted loadings.

(1) Individuals A and B made general allegations of poor welding quality on the Unit Nos. 1 and 2 pipeways, and could not disclose specifics with regard to discrepancy types or location. The investigator conducted an examination of about 200 prefab and field welds on the Unit No. 1 pipeway and about 50 prefab and field welds on the Unit No. 2 pipeway. The welds examined existed on both structural steel and pipe rupture restraint steel. The following discussion summarizes the findings, by unit.

(a) Unit Nos. 1 and 2

(i) Nine Unit No. 1 and two Unit No. 2 pipeway prefab welds were observed to have marginal amounts of undercut. Because of paint on these welds it was impossible to determine the actual depth of undercut, although no obvious deviations from specification requirements were noted. The licensee, recognizing the existance of undercut, subsequently wrote Discrepancy Report No. 293 which requires that an inspection of shop and field welds in both pipeways be accomplished to determine the extent and significance of weld undercut and that resolution of any noted deficiencies be specified by the Engineering Department. The results of this inspection and any resolutions specified will be verified by the NRC during a future inspection and is considered an unresolved item.

(b) Unit No. 1

(i) An arc strike (about 1/16" into base metal) was noted on a beam flange at restraint Bent No. 8B and an arc gouge was noted on a beam web at restraint Bent No. 9B. These items were subsequently documented on Discrepancy Report No. 293 as requiring Engineering evaluation and resolution. The arc gouge on the beam web at restraint Bent No. 9B was repaired on July 27, 1977. The repaired surface and the quality documentation of the repair were examined and appeared satisfactory, however, the final liquid penetrant examination of the repaired surface had not yet been completed. An NRC inspector will verify resolution of the above items during a future inspection.

(ii) It was noted that field weld number FW-40 on restraint Bent 9B of Drawing No. F000111 appeared to have areas of gusset plate chamfer or weld undercut of greater than 1/32". The licensee is evaluating the existence of chamfer or undercut. Kellogg Engineering Specification No. ESD-243 ("Pipe Rupture Restraints") specifies, in Paragraphs 2.1.4.C and 2.4.2, that undercut shall not exceed 1/32". This item will be examined further during future NRC inspections and is considered an unresolved item.

Examination of the required field process sheet disclosed that field weld numbers FW-40 and 41 on restraint Bent No. 9B were verified as completed and visually inspected on October 2, 1975 but the required verifications of fitup, preheat and cleanup were performed on October 3, 1975. In addition, the inspection of the root pass completion for field weld number FW-40 of restraint Bent 9B had not been performed as evidenced by the entry "NA" in the appropriate block of the restraint process sheet. Further examination disclosed that restraint Bent No. 9B and field weld numbers FW-22A, 22B, 23A, 23B, 23C, 24A, 24B, 24C, 29A, 29B, 30A, 30B, 31 and 32 apparently had not been visually inspected, as required, as evidenced by the entry "NA" in the final visual block of the weld field process record. Kellogg Engineering Specification ESD-243, in Paragraph 2.5.1, requires that inspections be performed to verify cleanliness, fitup, preheat temperature, root pass completion, weld completion and final visual examination acceptability and that all operations be documented on the restraint process sheet.

(2) Allegation: Mounting holes in the Unit No. 1 pipe rack personnel enclosure screen had to be redrilled because the personnel enclosure and beams did not fit together.

NRC Finding: The allegation was substantiated. The personnel enclosure screen is not safety related. Examination of the beams to which the Unit No. 1 personnel enclosure is mounted disclosed no instances where redrilling of the safety related structural steel occurred in order to accommodate the personnel enclosure screen.

(3) Allegation: Anchor bolts are pulling from the containment concrete due to the pipe rack weight.

NRC Finding: The allegation was not substantiated. Examination of the Unit Nos. 1 and 2 containment to pipe rack anchor bolts and anchor plates did not disclose any instances where anchor bolts appeared to be pulled from the containment concrete.

(4) Allegation: A quality assurance and control program was not in effect when the Unit No. 1 pipe rack was constructed.

NRC Finding: The allegation was not substantiated. Examination of the QA manual and welding procedures, utilized by the first pipe rack welding contractor, disclosed that the manual and procedures were approved by the licensee on July 15, 1970. It was determined that construction of the Unit No. 1 pipe rack did not begin until early 1971.

(5) Allegation: Welds on the Unit Nos. 1 and 2 pipe rack structural and pipe whip restraint steel were not preheated or stress relieved.

NRC Finding: The allegation was not substantiated. The Structural Welding Code of the American Welding Society specifies minimum preheat temperatures as a function of base material type and thickness. The investigator examined numerous procedures utilized by the pipe rack welding contractors and noted that all contained preheat requirements as specified by the Structural Welding Code. Stress relief treatment was not required by applicable contract drawings or specifications.

The records of approximately 100 Unit No. 1 and 135 Unit No. 2 pipe rack welds were examined and noted to contain adequate documentation of compliance with preheat and preheat inspection requirements.

(6) Allegation: Some lock nuts on structural steel bolts, for the Unit Nos. 1 and 2 pipeways, did not have full thread engagement and some bolts did not have lock nuts installed.

NRC Finding: The allegation was partially substantiated. An examination of the Unit No. 1 pipeway structural steel bolting disclosed the following as discussed in Paragraphs (6)(a),(b) and (c) below.

(a) Four locking nuts for containment wall anchor bolts on the embed plate at the 351 degree location did not have full thread engagement. Further investigation revealed that the lock nuts were full size nuts and that Drawing No. 438286 ("Pipeway

Structural Frame Details") only required half-size nuts and, therefore, the actual installation exceeded drawing requirements.

(b) Two of about eight high strength bolts were not installed in one beam-to-beam connection, and four or about ten high-strength bolts were not installed in a second beam-to-beam connection. Investigation revealed that in each case above the discrepant items were identified, documented and accepted as satisfactory by the licensee Engineering Department based on the fact that welded connections were substituted or all other bolts were properly installed (Licensee Discrepancy Report Nos. M-1148 of August 27, 1975 and M-1215 of September 17, 1975).

(c) One anchor bolt on the containment wall embed at about 287 degrees did not have a locking nut as required by Drawing No. 438286 (all other embed bolts had lock nuts), and one high strength bolt on a beam-to-beam attachment near valve FCV-41 was not torqued as required by the American Institute of Steel Construction (AISC) specifications (all other bolts on the connection were torqued). The licensee subsequently wrote Discrepancy Report No. 293 which documents these problems and requires resolution in that an inspection is to be conducted to verify proper bolt tightness. The resolution of these discrepancies will be verified by the NRC during future inspections.

(d) Examination of the Unit No. 2 pipeway disclosed that the three bolts on a containment anchor embed plate (for beam marked K4932 32M1) contained jam nuts which did not have full thread engagement. Investigation revealed that Discrepancy Report No. M-3327 was written documenting this fact. The discrepancy was approved by the Engineering Department based upon the presence of jam nuts on other bolts in the same plate. A similar condition of jam nut engagement was noted on one other embed plate, wherein four jam nuts did not have full thread engagement. In this case, the condition was documented and accepted by the responsible engineer in Discrepancy Report No. M-3365.

No other instances of improper structural steel bolting practices were observed.

d. "At the 115 foot level the resin trap filters and the associated welding are of poor quality."

NRC Finding: The allegation was substantiated. The filters in question at the 115 foot level are resin trap filters in the Steam Generator Blowdown Cleanup Treatment System. The document governing the fabrication of the filters is the ASME Boiler and Pressure Vessel Code, 1971 Edition, Section VIII, which requires that welds be free from coarse ripples or grooves, undercuts, overlaps, and abrupt ridges or valleys.

Examination of the Unit Nos. 1 and 2 resin trap filters disclosed that the vessels were code stamped, as required, and that some pressure retaining welds appeared to have undercut and abrupt ridges or grooves, contrary to the requirements of the fabrication code.

The resin trap filters for the Steam Generator Blowdown Cleanup Treatment System are not safety related and not subject to the quality assurance criteria of 10 CFR 50, Appendix B.

e. "In Unit No. 2, elevation 85, a structural support beam is out of level one inch in 6 feet."

"In Unit No. 2, elevation 132½, the pipe rack is out-of-square."

This is a consolidation of two GAO items of concern so as to preclude NRC finding repetition.

Discussions with Individual A disclosed that, while the elevations identified are approximate, the out-of-level and out-of-square conditions identified existed on the Unit No. 2 pipe rack on the south side of Unit No. 2 containment.

NRC Finding: The GAO items of concern were substantiated. Examination of numerous beams and supports installed on the Unit No. 2 pipe rack disclosed that three beams were out-of-level by at most one-half inch in two feet. The observed out-of-level and out-of-square conditions were less than the American Institute of Steel Construction maximum specification of 7/16" in 12 inches.

The licensee had documentation disclosing that problems had been experienced with Unit No. 2 rupture restraint to pipe support alignment and that the specific instances had been properly resolved.

f. "A 40 foot tower device for inservice inspection was installed in the Unit No. 1 reactor vessel. The welding performed on this tower was very poor."

NRC Finding: The GAO assessment revealed that the tower was the mounting frame for an ultrasonic scanning instrument which was undergoing pretest calibration and that the frame was not a part of the plant and did not require construction or fabrication techniques to support any part of the plant. The NRC concurs with this assessment.

4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Unresolved items disclosed during the investigation are discussed in Paragraphs 3.c.(1)(a)(i) and (b)(ii).

5. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) on July 14, 1977 and August 3, 1977 at the conclusion of the investigation. The inspector summarized the circumstances necessitating the investigation, as well as the investigation scope, findings and the item of noncompliance discussed in Paragraph 3.c(1)(b)(ii) above.

UNITED STATES GENERAL ACCOUNTING OFFICE
REGIONAL OFFICE
[illegible] COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30303

July 22, 1977

Mr. R. H. Engleken, Director
Region V, Nuclear Regulatory Commission
Suite 202, 1990 North California Boulevard
Walnut Creek, California 94596

Dear Mr. Engleken:

On June 9, 1977, we completed our review work at the Nuclear Regulatory Commission Region V office and at the Diablo Canyon construction site. As a part of that effort, we interviewed several regional inspectors, and reviewed pertinent inspection reports.

At the Diablo Canyon plant we interviewed cognizant individuals, reviewed documentation, and made visual observations of some of the items addressed in the NRC inspection reports. With the aid of our consultant, Mr. T. W. Miller, we also performed some work of this nature that was independent of any NRC inspection. In addition, we interviewed 84 individuals employed at the plant as construction supervisors, quality control/quality assurance personnel, or as craftsmen who were or had been engaged in safety related work.

The objective of our interviews was two-fold. Primarily, we wanted to get a view of NRC inspectors from the people they inspect; secondly, we wanted to solicit confidential opinions from those individuals as to the overall quality of the work performed at the Diablo Canyon Plant.

Our inquiries resulted in the identification of nine items concerning the quality of plant construction. We assessed these items to the extent our time constraints permitted. Both the items of concern and our assessment of them are enclosed. The results of our other work will be included in an overall GAO report to the Congress on NRC's inspection and enforcement effort at the conclusion of all our review work.

In telephone conversations with Messrs. Spencer and Birch we provided the names of those individuals raising the items of concern. We also recommended that any additional questions pertaining to the assessment of these items be directed to Mr. Miller.

We again wish to thank you for your cooperation during both our visit to your office and Diablo Canyon.

Sincerely,

Solon P. Darnell
Assistant Regional Manager

Enclosure

Items of Concern	GAO's Assessment
1. Improper installation of pipe hangers, pipe racks, and seismic limiters.	The licensee and his contractor presently conducting an inspecti testing, and repair program in b units # 1 and # 2 which encompass all three subjects.
2. During the installation of pipe hangers and racks anchor bolts were cut short or omitted to avoid drilling rebar on resetting the hangers or racks.	The above mentioned program will neither detect or correct this problem.
3. The pre fab welds on the seismic restraints in unit # 1 are of poor quality.	About 50 welds were reviewed in various locations in unit # 2, a about 30 in unit # 1. It was co that while several of these welds played excessive weld material a minor degrees of external slag, w believe that the sample taken was in violation of codes and standa
4. At the 115 foot level the resin trap filters and the associated welding are of poor quality.	Due to time constraints we were unable to evaluate this item.
5. In unit # 2, elevation 85, a structural support beam is out of level one inch in 6 feet.	At the time of our evaluation of this item we were unable to obtai a clear view of this area due to extensive scaffolding and weld curtins mounted in the area. The visual inspection which could be performed did not reveal any gros alignment problems.
6. In unit # 2, elevation 132 1/2, the pipe rack welding is of poor quality. The iron welded was neither preheated or stress relieved.	The welding reviewed by this team seemed to be of code quality. We were unable to determine weather not the iron was preheated or str relieved.
7. In unit # 2, elevation 132 1/2 the piperack is out of square.	This item could not be evaluated without proper tools and dimensi A visual inspection of this area, however, did not reveal any gros alignment problems.

Items of Concern	GAO's Assessment
8. In unit # 2, elevation 126-127 there has been sloppy work performed on the pipe restraints.	Our review of this item revealed there was some rework performed in this area. The welding, however, appeared to be of code quality.
9. A forty foot tower device for inservice inspection was installed in the unit # 1 reactor vessel. The welding performed on this tower was very poor.	An evaluation of this item revealed that the tower was the reception frame for the UT scanning instrument which was in process of pre-test calibration. The frame was submerged in water at the time. It is not a part of the plant and did not require construction or fabrication techniques to support any part of the plants integrity.