

PACIFIC GAS AND ELECTRIC COMPANY

PG&E



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D. A. BRAND  
VICE PRESIDENT  
ENGINEERING

*DESIGNATED ORIGINAL*  
*Certified By [Signature]*

May 29, 1984

PGandE Letter No. : DCL-84-195

Mr. Thomas W. Bishop, Director  
Division of Reactor Safety and Projects  
U. S. Nuclear Regulatory Commission, Region V  
1450 Maria Lane, Suite 210  
Walnut Creek, CA 94596-5368

Re: Docket No. 50-275, OL-DPR-76  
Docket No. 50-323  
Diablo Canyon Units 1 and 2  
Response to 146 Allegations

Dear Mr. Bishop:

Appendix A to your letter dated April 27, 1984 contained a list of 146 allegations or concerns which you turned over to us for evaluation, investigation, and response. Enclosed are our responses to these allegations or concerns. For convenience, our responses follow the numerical order of the NRC "allegations" in Appendix A to your letter except where we have combined two or more "allegations."

Enclosure 1 identifies those allegations to which we have already responded, and Enclosure 2 contains our substantive responses to the remainder. Those portions of Enclosure 2 which respond to Allegations #443-449 and #453-455 contain Safeguards Information. This Safeguards Information has been separated from Enclosure 2 and is provided as Enclosure 3.

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**SECURITY**  
**SAFEGUARDS INFORMATION**  
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*"for release to PDR"*  
*H005*  
*Encl 3 w/drawn*

Mr. T. W. Bishop  
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The responses to Allegations #443-449 and #453-455 contain Safeguards Information as defined in 10 CFR 73.21(b). This information is being furnished separately and should be protected from public disclosure in accordance with the requirements of 10 CFR 73.21.

Our responses are true and correct to the best of my knowledge, information, and belief.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Subscribed in San Francisco, California this 29th day of May 1984.

Respectfully submitted,

Pacific Gas and Electric Company

By *D. A. Brand*  
D. A. Brand  
Vice President  
Engineering

Robert Ohlbach  
Philip A. Crane, Jr.  
Richard F. Locke  
Dan G. Lubbock  
Attorneys for Pacific  
Gas and Electric Company

By *Philip A. Crane, Jr.*  
Philip A. Crane, Jr.

Subscribed and sworn to before me  
this 29th day of May, 1984

*[Signature]*

*C. T. Neal-Madison*  
C. T. Neal Madison, Notary Public in  
and for the City and County of  
San Francisco, State of California



My commission expires December 27, 1985.

Enclosures

cc: H. R. Denton  
J. B. Martin  
Service List - w/o Safeguards Information



**SECURITY  
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## ENCLOSURE 1

This table provides a cross-reference to the locations of previous responses to certain allegations identified in the NRC-Region V letter of April 27, 1984. Response locations are identified by either the PGandE submittal letter number (DCL-84- ) or "CQA" or "DQA". "CQA" refers to PGandE's Answer in Opposition to Joint Intervenors' Motion to Reopen the Record on the Issue of Construction Quality Assurance and Licensee Character and Competence dated March 19, 1984. "DQA" refers to PGandE's Answer in Opposition to Joint Intervenors' Motion to Augment or, in the Alternative, to Reopen the Record dated March 6, 1984. The reference "(2)" means the second affidavit by the named affiant in the particular response.

NRC Allegation No.

Response Location

NRC Allegation No.	Response Location
225	CQA - Geske (2), <u>et al.</u> Aff. at 4
227	CQA - Breismeister, <u>et al.</u> Aff. at 38
234	CQA - Geske (2), <u>et al.</u> Aff. at 14
235	CQA - Geske (2), <u>et al.</u> Aff. at 14
236	CQA - Rockwell, <u>et al.</u> Aff. at 2
237	CQA - Rockwell, <u>et al.</u> Aff. at 2
239	CQA - H. R. Arnold, <u>et al.</u> Aff. at 2
240	CQA - H. R. Arnold, <u>et al.</u> Aff. at 6-7
241	CQA - H. R. Arnold, <u>et al.</u> Aff. at 7
242	CQA - Geske (2), <u>et al.</u> Aff. at 21
243	CQA - Geske (2), <u>et al.</u> Aff. at 22
244	CQA - Karner, <u>et al.</u> Aff. at 44
245	CQA - Karner, <u>et al.</u> Aff. at 45
246	CQA - Karner, <u>et al.</u> Aff. at 44
251	CQA - Karner, <u>et al.</u> Aff. at 13

## NRC Allegation No.

## Response Location

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253	DQA - Breismeister, <u>et al.</u> Aff. at 26; Tresler, <u>et al.</u> Aff. at 9-10
255	DQA - Shiffer, <u>et al.</u> Aff. at 19-20
257	DQA - Shiffer, <u>et al.</u> Aff. at 20
258	DQA - Shiffer, <u>et al.</u> Aff. at 21
259	DCL-84-123 - Shiffer, <u>et al.</u> Aff. at 7
261	DCL-84-123 - Shiffer, <u>et al.</u> Aff. at 8
263	DCL-84-166 - at 4-7
264	DCL-84-166 - at 4-7
265	DCL-84-166 - at 4-7
266	DCL-84-166 - at 59-61
267	DCL-84-166 - at 59-61
268	DQA - Breismeister, <u>et al.</u> Aff. at 53
269	DQA - Breismeister, <u>et al.</u> Aff. at 53
270	DCL-84-166 - at 7-8
274	CQA - Karner, <u>et al.</u> Aff. at 10-12
278	CQA - Karner <sup>(2)</sup> , <u>et al.</u> Aff. at 2-3
284	DCL-84-166 - at 83
294	DCL-84-166 - at 68
295	DCL-84-166 - at 70-71

ENCLOSURE 2

NRC Allegation #352

The following allegations relate to the failure analysis report prepared by PGandE's Department of Engineering Research (DER) for Field Weld (FW) 212 (Steam Generator 1-2 feedwater nozzle to pipe weld).

It is alleged that:

1.) The Pullman welding procedure specification (WPS) supplied for the report has a revision date of 6/16/76. This is obviously not the WPS that was used for the actual weld performed in May of 1974. (4/10/84 Lockert Aff. at 3.)

1. The WPS 200 revision dated June 16, 1976, is not significantly different from the original November 14, 1973, version. The minor differences do not relate to the failure analysis. The 1976 revision was used in the report, according to the authors, because it was convenient. The allegation has no significance, and no action is required.

It is alleged that:

2.) Pullman WPS 200 has an original date of 11/14/73, the date at which time the WPS was legally in effect. However, the accompanying Procedure Qualification Record (PQR) was performed on 12/28/73 over a month later. The WPS requires a PQR before the WPS can be written or used in the field. (4/10/84 Lockert Aff. at 3.)

2. Mr. Lockert apparently does not realize that the ASME Code Section IX, paragraph QW 200.2, 1983 edition, and Q-10 in the 1971 edition require the Welding Procedure Specification (WPS) to establish the welding

parameters and variables. The qualification test coupon is then welded within the ranges established in the WPS. After welding and testing, the Procedure Qualification Record (PQR) records the variables and test results. The WPS is then issued for use. Kellogg (Pullman) correctly followed code requirements. WPS 200 was issued to construction for steam generator nozzle welds three days after the PQR was completed. (See Attachment 1, Memo from R.G. Fink to T. Bell dated 12/31/73.) The WPS was properly written and was then qualified before it was used.

3. This allegation is without merit, and no further action is required.

It is alleged that:

3.) The nozzle material ASME SA-508 Class 2 is a P3 classified material under ASME Boiler & Pressure Vessel Code, Section IX requirements. Pullman's WPS 200 and accompanying PQR (P12b-P1-K1-F4-SMAW-6G) are for welds between P12b and P1 classified materials. The WPS for the nozzle welds would have had to be for P3 to F1 materials only. (4/10/84 Lockert Aff. at 3.)

4. Mr. Lockert is wrong again. The steam generator nozzles are SA 508 Class 2 material, which was classified as P12B in ASME Section IX, 1971 edition, Table Q-11.1. The Code has subsequently reclassified P12B materials. SA 508 Class 2 is now a P3 material. The qualification material as reported in the PQR was A 508 Class 2 (P12B) and 106 Grade B (P1), the same materials as used for the nozzle-to-pipe welds. That the WPS and PQR were correct for the nozzle welds should have been obvious

to everyone, including Mr. Lockert. Mr. Lockert should also have noted that the California Authorized Inspector, Mr. Carosella, refers to the material as P12B in Mr. Lockert's Exhibit 1. The allegation has no merit, and no action is required.

It is alleged that:

- 4.) Pullman WPS 200 states that the preheat is only required for the SMAW portion of the weld. This procedure allows the tack and root welding to be performed without the benefit of a preheat. This procedure has an ANSI B31.1 Power Piping Code non-compliance written into it because the very definition of a preheat means "heating the base metal before a welding or cutting operation (see paragraph 100.2, definitions, of ANSI B31.1 1977 edition.) (4/10/84 Lockert Aff. at 3-4.)"
5. The allegation is misleading and, based on the facts regarding the application of preheat, has no significance. Kellogg's Section IX PQR for WPS 200 required preheating for the tack welds and root pass of 100<sup>o</sup>F or more. The preheat recording charts for the welds in question have been reviewed, and they establish that the tack welds and root passes were in fact preheated to at least 200<sup>o</sup>F, as required. Lockert also is wrong in stating a B31.1 noncompliance, because B31.1 did not address the SA 508 Class 2 material, P12B.

It is alleged that:

- 5.) Page 2 of WPS 200 has significant data on weld joint preparation written in so small that the data is illegible (sic). (4/10/84 Lockert Aff. at 4.)
6. This is a nonissue. Joint preparation data is of no technical significance in the FW 212 crack analysis. On controlled copies the

small writing is legible. Legibility has been lost during reproductions. No action is required.

It is alleged that:

- 6.) Copies of the original Certificate of Analysis for the three electrode lots of E 8081-C3 show that one of the original lots L416F3AC was not even shipped until 2/20/75 nine months after the weld was performed. (4/10/84 Lockert Aff. at 4.)
7. The DER report was intended to show data relevant to crack propagation through the weld. The indication in the DER report, that Lot L416F3AC had been used in FW 212, was incorrect. ~~What lot was used? Was it lot L416F3AC?~~
8. The welding electrode requisition records for FW 212 show that the 3/32 inch diameter electrodes of this lot, L416F3AC, were not used. The 1/8-inch diameter electrodes which were used in FW 212 were from lot B228C3AD, and this Certified Materials Test Report (CMTR) is in the DER report. Whether the L416F3AC data were included or not does not affect conclusions or recommendations of the report.
9. The allegation has no technical significance, and no action is required.

It is alleged that:

- 7.) Figure 5 showing the crack in a macroexamination has the pipe and nozzle identifications reversed. (4/10/84 Lockert Aff. at 4.)



10. The figure accurately shows the crack on the nozzle side of the weld. This is known by the root mismatch geometry and by the location of the microhardness indentations. The figure caption is obviously reversed, but this has no significance, because the text is clear. The conclusions and recommendation were based on direct measurements and observations of which this figure is only an illustration. The allegation is of no technical significance and no action is required.

It is alleged that:

8.) The Certification of Analysis for the E 70S-2 filler metal and E 70S-2 insert have not been provided. (4/10/84 Lockert Aff. at 4.)

11. The consumable insert and the Gas Tungsten Arc Welding (GTAW) filler material (E70S-2 composition) were not included because these data are not relevant to the cracks which originated at the fusion line and/or in the nozzle heat-affected zone (HAZ). The lot numbers for this material were recorded on filler metal withdrawal records for FW 212 and the CMTRs, and are on file. This allegation has no significance. No action is required.

It is alleged that:

9.) The Laboratory Sample 577.329 has been mistakenly labeled P12B material. Note that there is no P12B material listed under QW 422 of the ASME Code, Sec. IX (see page 27 of the PG&E report.) (4/10/84 Lockert Aff. at 4.)

12. As explained above in the response to item 3, Mr. Lockert is wrong; the SA 508 Class 2 nozzle forging was classified as P12B in the ASME Code, 1971 edition, Table Q11.1. No action is required.

It is alleged that:

10.) Table 1 of PG&E's report shows a preheat being performed on May 18, 1974 when the Pullman Swindell report specifically states that the preheat was only from May 22, 23, and 24 of 1974 (Table 1 is on page 9 of report.) (4/10/84 Lockert Aff. at 4.)

13. The preheat recording chart shows that the weld was preheated for tack welding on May 18, 1974. Those tack welds were subsequently removed, and the joint was re-preheated and tack welded again. The preheats are on charts 322 and 323. The allegation has no significance. No action is required.

NRC Allegation #353 and #354

It is alleged that:

Steam Generator 1-1 nozzle to pipe weld also has an interesting history. F.W. 197 was first performed prior to a Dec 3rd meeting between Mr. J. W. Ryan and Mr. P. J. Carosella, the then Pullman Construction Manager and Senior Safety Engineer for the Department of Industrial Relations of the State of CA, respectfully (sic). Mr. Carosella makes mention of the fact that F. W. 197 had experienced a crack extending the circumference of the pipe because Pullman production had welded with out (sic) the use of

preheat. The process sheet for the second try at F.W. 197, which by the way is not marked R1, is shown with the process sheet for F. W. 212 provided on page 33 of PG&E's report. Note that the preheat for the second try is not signed of (sic) by the MWK inspector and there is no reference to a preheat chart. Also note the inconsistencies in the inspection coverage between the two welds: the ANI checked for visual inspection but not the root pass on F.W. 197 but did just the opposite for F.W. 212. I think that the DR that covers why F.W. 197 was welded without preheat before Dec. 3 should be examined to make sure that the corrective action called for by Mr. Carosella in his Dec. 18th letter addressed to J.P. Runyan, W. M. Kellogg's QA/QC Manager was adequately established. Also, some explanation for the lack of preheat data available for the second attempt at F.W. 197 during Dec. 23 to Dec. 30 of 1974 must be provided. It occurs to me that both of these mistakes appear to be reportable per 10 CFR 50, paragraph 50.55e. (4/10/84 Lockert Aff. at 5-6.)

14. The allegations are misleading; they are based on suppositions rather than facts.
15. The welding activity on the steam generator 1-1 feedwater nozzle (FW 197) prior to December 3, 1974, consisted of temporary welds for shipping caps and hydrotest caps. No permanent installation welds were attempted then. The crack documented by DR 2450/Rev. 1 in June 1974, was related to a temporary weld. There was only one FW 197, that on December 23 - 30, 1974. There was no need to identify this weld as R1 because it was not, as alleged, a repair of a previously cracked weld. The preheat for FW 197 began December 24, 1974, prior to tack welding and was provided for all other FW 197 welding. This preheat need not have been signed off by Kellogg's inspector because it was recorded on chart 332.

16. Contrary to the allegation, differences in inspection coverage of in-process welding on FW 197 and FW 212 are permissible; it is not a code requirement that all welds receive the same in-process inspection. It is permissible that inspections be done on a surveillance basis. Kellogg's Quality Program requirements were met.
17. Similarly, root pass inspection was done on a surveillance basis by the authorized inspector. This inspection frequency is appropriate and permissible.
18. Contrary to the affidavit statement that there is no reference to a preheat chart for FW 197, Mr. Lockert's own Exhibit 6, upon which the allegation is based, has the notation: "use chart recorder." The preheat was recorded on chart number 332.
19. Mr. Carosella, addressing the crack related to the temporary weld, indicated that lack of preheat was the problem, as had been documented in DRs. However, he indicated incorrectly that the welders had been assigned prior to receipt of a qualified WPS for P1 to P12B material. Mr. Carosella did not have complete information. The P1 to P12B WPS had been qualified the previous year and was released to Kellogg construction on December 31, 1973. The lack of preheat was corrected on the subsequent welds. Interestingly, Mr. Carosella correctly refers to SA508 Class 2 as P12B material (Lockert Exhibit 1).

20. The reportability issue has been discussed in the response to Allegation #338. The supposition that reportable activity had occurred in this case is incorrect.
  
21. These allegations have no merit and no implications with regard to safety. No action is required.

NRC Allegation #355

It is alleged that:

F. W. 197 was subsequently radiographed and the film read by an individual named Ken Beck on 1/28/75. Mr. Beck noted that tungsten inclusions were distributed through about 75% of the weld. Mr. Beck did not note a drop thru (sic) that also had linearly oriented voids. Apparently, someone requested another radiograph because the weld was reradiographed but with wider film to include a repair to the nozzle. Again the weld was accepted but this time with recognition of the burn thru (sic) on 2/11/75 by Mr. Shore.

The time frame for documentation of events now shifts to March 17, 1977 when the leak was discovered in F.W. 212. These events are documented in the M. W. Kellogg QA Report by J. P. Runyan dated 4/12/77. The radiograph for F.W. 197 was again reviewed at this time and a decision was reached to now remove the drop thru (sic) present on the inside of the pipe. The repair was made per DR 3370 and consisted of cutting a hole in the pipe and grinding out the burn thru (sic). I think that it should be noted that the R. P. Runyan noted DR 3370 in his report dated 4/12/77 but that the letter addressed to Mr. R. H. Engelken of the U S N R C Office of Inspection and Enforcement, Region V, written by a Mr. Philip A. Crane, Jr. makes no mention that a condition requiring repair had been found, in fact, Mr. Crane reported that PG&E's examinations revealed no rejectable indications for any of the four main steam and three feedwater welds as of 4/15/77. (4/10/84 Lockert Aff. at 6-7.)

22. The allegation that PGandE failed to report rejectable indications is misleading and incorrect as indicated in the response to Allegation #338. The letter of April 15, 1977, is the 10 CFR 50.55(e) progress report of the crack condition on FW 212. The radiographic interpretation issue grew out of the FW 212 leakage but is a separate issue.
  
23. The context of DR 3370 needs to be kept in mind, and the nature of the droptrough needs to be considered in relation to the FW 212 leak. After the FW 212 leak, all steam generator nozzle radiographs were reviewed by Pullman and the NRC. These were documented as part of DR 3370 as early as March 23, 1977. One weld, FW 197, had a questionable discontinuity that was known to the NRC in March. Earlier, Beck's report had accepted the condition without notation. A second radiograph, using a different technique, revealed the burnthrough and the radiographic film reports had noted and accepted the condition. Ultrasonic examination and additional radiography indicated that the discontinuity condition was not significant. The indication was questionable and subject to different interpretations.
  
24. Lockert has misrepresented Runyan's April 12, 1977 report and has cited the decision to remove the droptrough out of context. The correct context is that ultrasonic examination had shown the droptrough not to be significant and that the droptrough was previously identified and accepted. However, because of the problem with FW212, it was determined

that any questionable situation should be resolved. It was therefore determined that the droptrough should be removed (Lockert Exhibit 4).

25. The discontinuity was unrelated to the FW 212 leakage. The report of April 15, 1977, was correct in stating there were no rejectable indications in steam generator nozzle welds. The NRC knew of the indication and its significance prior to the April 15, 1977 letter. The NRC subsequently issued its Notice of Violation regarding this droptrough, not because of its technical significance or relation to FW212 or that it was rejectable, but rather because of the manner in which it was recorded on the reader sheet. The decision to repair the droptrough was made on March 23, 1977, prior to receiving the Notice of Violation. This allegation has no merit, and no further action is required.

#### NRC Allegation #356

It is alleged that:

In DR 3370 Mr. R. P. Runyan had noted that when he had reviewed Mr. Ken Beck's record for radiographic interpretation it was found that Mr. Beck had hired in on 1/2/74 but that he had not certified to the M. W. Kellogg radiographic Level II position until 8/9/74 and that he had accepted radiographs before he was certified to do so. However, instead of reporting the non-conformance via the QA system and notifying the licensee (sic) Mr. Runyan attributed the QA breakdown to an administrative error. A problem with Mr. Beck's work was apparent as early as 4/5/77 as evidenced by the interoffice correspondence from S. L. Engler to R. P. Runyan where Mr. Engler states that some of the welds must be repaired. (4/10/84 Lockert Aff. at 7.)

26. The situation regarding Ken Beck, Level II, was documented in DR 3370, which was initiated on March 23, 1977. It was also contained in M. W. Kellogg Quality Assurance Report of Documentation and Radiographic Film Review, by the QA/QC Manager, dated April 22, 1977. The Kellogg report references DR 3370, and DR 3370 references the Kellogg report. Thus, the problem was reported in the QA System. Beck's interpretation of radiograph was subject to 100% reexamination in 1977. The results of other radiographic interpreters were also reexamined, and this, in turn, resulted in PGandE making a 10 CFR 50.55(e) report on radiographic interpretation on July 6, 1977. By August 4, 1977, PGandE reported to the NRC that the films for 1,675 welds had been rechecked. On October 26, 1977, PGandE reported that all radiographs of Design Class 1 field pipe welds by Pullman had been reviewed for both Unit 1 and Unit 2. It is obvious that the radiographic interpretation issue was handled within the QA program in a very extensive examination effort. No further action is required.
27. Contrary to the allegation that Mr. Runyan operated outside the QA System, the administrative error statement comes from a QA report attached to DR 3370, which was given to PGandE. Mr. Lockert has taken this statement out of context. He conveniently omitted the very next sentence, which stated, "To assure that the films were properly interpreted and accepted by a qualified reader, all of Beck's film was reinspected." (Lockert Exhibit 4)



28. Contrary to the allegation, Mr. Runyan's discovery regarding documentation of Mr. Beck's qualification was reported to PGandE pursuant to QA procedures. Mr. Runyan's report was attached to DR 3370 which was forwarded to PGandE. Even though the error was administrative in nature only, all of Mr. Beck's films were reinspected. This item is of no technical significance and no further action is required.

NRC Allegations #357 and #358

It is alleged that:

Although PG&E could find no rejectable indications in the steam generator nozzle to pipe welds as of 4/15/77 all four of the nozzle to pipe welds were reworked from the inside of the pipe during the period from 8/31/77 to 11/28/77. Cracks were found on the inside surface of F.W. 197, a grind and polish method was used to chase the cracks. One of the cracks was 5 3/8" long and required grinding below the minimum wall thickness before a liquid penetrant test would yeild (sic) positive results. Of course after the minimum wall thickness had been violated a weld repair was in order. The grinding out of the cracks and the weld repair to F. W. 197 was apparently done to an interoffice correspondence initiated by a Mr. Don Geske instead of the direction of PG&E as indicated in step nine of DR 3484. The welding of course, would have required a process sheet, filler metal requisitions, and the full awareness of a QC welding inspector. The DR 3484 fails to include these requirements in the recomended (sic) disposition and Mr. Don Geske was not qualified to do visual welding inspections. (4/10/84 Lockert Aff. at 7-8.)

29. These allegations are misleading in stating that interoffice correspondence (IOM) was used instead of PGandE-approved DR direction. The IOM was incorporated into the DR 3484 by attachment. The DR was signed off by the Pullman QA manager and PGandE on

October 12, 1977, and again for Revision 2 on October 14, 1977. Mr. Lockert should have recognized this, because it is one of his exhibits (Lockert Exhibit 9). Mr. Lockert's allegations are especially misleading regarding visual examination because, contrary to the allegation, Geske was qualified at that time to do visual inspection and because the examinations involved liquid penetrants (PT) and magnetic particle (MT) rather than visual.

30. The recommendation for weld repair without referencing a specific WPS was appropriate for the IOM because the appropriate WPS was required to be selected by others before a process control sheet was issued. WPS 200 was specified in Step 9A, DR3484, Rev. 2, pg. 3 (Lockert Exhibit 9). Contrary to the implications of the allegation, the proper documents were completed. The weld process sheet for FW197 R1, dated October 17, 1977, references WPS 200. The weld rod requisition for FW197 R1 is dated October 19, 1977. Kellogg inspectors appropriately signed off the process sheet from October 19 through November 2, 1977. The Authorized Inspector signed off "Cleaning," "RT Finished Weld," and "Stress Relieve."
31. The weld repairs inside were examined by MT and radiography and accepted. Additionally, the remaining inside surface conditions were subject to PT and inspection by PGandE Mechanical Engineering, PGandE DER, and Westinghouse.

32. The repair inside FW 197 was properly documented and controlled. This allegation is misleading and has no technical merit. No action is required.

NRC Allegation #359

It is alleged that:

Three cracks were found that required violation of minimum wall thickness before they could be successfully removed. Removal of the first crack left a groove 10" long that required grinding through about half of the pipes thickness before the crack on the nozzle side of the root pass was removed. I am not suprized (sic) that no one recognized that this crack was similar to the one that occured (sic) on F.W. 212 because that would indicate a generic problem. In fact, the people involved were very carefull (sic) not to refer to the defect as a crack, it was a linear indication right up to and even after the weld repair. The game is over because linear indications do not require weld repairs but cracks do. (4/10/84 Lockert Aff. at 8-9.)

33. PGandE, using conservative engineering and responsible QA practice, determined that the possibility of the FW212 problem might extend to other steam generator nozzles. To resolve any questions regarding the possibilities in other nozzles, PGandE developed a plan for inspection and repair, if necessary, and notified the NRC of this plan on August 15, 1977.
34. There is no generic problem regarding the steam generator nozzles because PGandE inspected and repaired, where necessary, all nozzles to pipe welds. The need to compare similarity of characteristics of cracks was consequently obviated.

35. Contrary to the implication of the allegation, there was no insidious reason to avoid calling a crack a crack. The reason linear indications were reported for the internal discontinuities is that the procedures and specifications refer to linear and rounded indications. Most linear discontinuities were, in fact, items other than cracks, such as lack of fusion, machining/grinding marks, and rootbead roll over.
36. Mr. Lockert is also wrong in stating that linear indications do not require repairs. Linear indications, such as lack of fusion, are not cracks and do require repairs.
37. No further action is required.

NRC Allegations #338 and #340

It is alleged that:

A defect had been found, a crack extending 10" long and approximately half way through the thickness of the pipe. The crack originated on the nozzle side of the root pass under a roll over where the reentrant angle was probably less than 90. Other cracks had been observed in the land surfaces of the nozzle and pipe counterbores. Lets compare the above to a quote from PG&E's report 411-77.55 "It is believed that small cracks initiated on the I. D. of the nozzle, weld, and pipe during the thermal cycling that occurred (sic) during preheating. These small cracks originated at convenient stressrisers such as grinding scratches and regions of lack of fusion and weld bead rollover." Mr. Runyan could not see the similarities between the two because he had already made up his mind about the failure of F.W. 212 back in April. Mr. Runyan said in his summary to his QA Report of F. W. 212 "It is my believe (sic) that the crack was peculiar to F.W. 212 only and not of a generic nature. Therefore, at this time we

are assuming that no further repair will be required and that when the disposition of D. R. 3370 is completed the subject will be closed."

Defects had been found in steam generator nozzle to pipe welds that had been fully inspected and accepted. F.W. 197 and F.W. 244 revealed cracks on the nozzle side of the root similar to the crack that initiated the failure of F.W. 212. These cracks are defects which, if they were left uncorrected could have adversely affected the safety of the plant. The defects should have been reported to the Commission. I believe that a break down in Quality Assurance of construction has occurred (sic) because the welds had been accepted and had been put in service without (sic) discovering the defects. Additionally, after the failure of F.W. 212 when a 100% reinspection of radiographs on Class I welds had revealed problems in previous interpretations, when F.W. 197 required repair in April, and when extensive repairs had been made to all the nozzle to pipe welds in Unit 1 the NRC had not been notified as required by 10 CFR 21 and/or 10 CFR 50.55e. I believe that PG&E's failure analysis of F.W. 212 is shoddy work, I believe that there has been an attempt to fix the mistakes on the sly and that there has been purposeful (sic) withholding of information from the commission. (4/10/84 Lockert Aff. at 9-10.)

It occurs to me that both of these mistakes appear to be reportable per 10 CFR 50, paragraph 50.55e. (Lockert Aff. at 6.)

F. W. 197 was subsequently radiographed and the film read by an individual named Ken Beck on 1/28/75. Mr. Beck noted that tungsten inclusions were distributed through about 75% of the weld. Mr. Beck did not note a drop thru (sic) that also had linearly oriented voids. Apparently, someone requested another radiograph because the weld was reradiographed but with wider film to include a repair made to the nozzle. Again the weld was accepted but this time with recognition of the burn thru (sic) on 2/11/75 by Mr. Shore.

The time frame for documentation of events now shifts to March 17, 1977 when the leak was discovered in F.W. 212. These events are documented in the M. W. Kellogg QA Report by J. P. Runyan dated 4/12/77. The radiograph for F.W. 197 was again reviewed at this time and a decision was reached to now remove the drop thru (sic) present on the inside of the pipe. The repair was made per DR 3370 and consisted of cutting a hole in the pipe and grinding out the burn thru

(sic). I think that it should be noted that the R. P. Runyan noted DR 3370 in his report dated 4/12/77 but that the letter addressed to Mr. R. H. Engelken of the U S N R C Office of Inspection and Enforcement, Region V, written by a Mr. Philip A. Crane, Jr. makes no mention that a condition requiring repair had been found, in fact, Mr. Crane reported that PG&E's examinations revealed no rejectable indications for any of the four main steam and three feedwater welds as of 4/15/77. (4/10/84 Lockert Aff. at 6-7.)

This dissertation has been reduced by the NRC staff to five issues for which responses have been requested. These are the following:

338. Failure to report crack on FW 212 to NRC per 50.55 (e) correction to cracks undetermined.
339. Q.A. breakdown due to failure to discover welding defects.
340. Failure to notify NRC per 10 CFR 21/50.55 (e) when 100% reinspection of radiographs revealed previous misinterpretation.
354. Failure to report welding deficiencies per 50.55 (e).
355. Failure to report rejectable indication stated in DR3370 to NRC.

#### NRC Allegations #338 and #340

38. The following is a chronological overview which places the steam generator feedwater nozzle FW 212 issues into perspective. PGandE reported the situation and made complete disclosure of subsequent related events. There was 100% reinspection of steam generator nozzle welds. There was also an extensive reexamination of radiographic film. All PGandE actions are documented. The allegations result from an after

the fact review of a portion of related documents by an individual who was not onsite or even a QA/QC inspector at the time of the events in question. Mr. Lockert's allegations regarding failure to report to regulatory authorities and a coverup are incorrect. This chronology is applicable to the reportability aspects of NRC Items 338, 339, 340, 354, and 355.

39. Chronological Overview

March 17, 1977. A leak was revealed in the steam generator feedwater nozzle weld during testing. The testing was stopped, and the leak was investigated.

March 18, 1977. PGandE notified the NRC Office of Inspection and Enforcement, Region V of this condition.

March 23, 1977, a Discrepancy Report (DR) 3370 was opened to document the radiographic interpretation concerns related to this issue. The NRC participated in the radiographic review. Re-review of radiographs was begun.

April 18, 1977. A preliminary 10 CFR 50.55(e) report was made to Region V regarding nozzle cracks.

May 6, 1977. The NRC notified PGandE regarding a noncompliance in relation to the radiography issue.

June 3, 1977. PGandE reported to NRC Region V on the review of radiography, and responded to Notice of Violation.

June 3, 1977. PGandE made report to NRC Region V regarding FW 212 crack cause and repairs, and indicated an ongoing investigation.

July 6, 1977. PGandE advised the NRC of a possible 50.55(e) report regarding radiographic interpretation.

August 4, 1977. PGandE made progress report to NRC Region V on the Radiographic 50.55(e) report.

August 15, 1977. PGandE advised the NRC Region V of the current status on feedwater nozzle welds and advised the NRC of plans to look at the interior of other feedwater and main steam nozzles and the intention to repair rejectable indications. NRC staff was invited to inspect these nozzles.

October 26, 1977. A final report was made to NRC Region V regarding the radiographic issue. All design Class 1 field pipe welds performed by Pullman were reviewed. Repairs necessary in Unit 1 were completed. The radiographs for 235 factory pipe welds were reexamined, and no defects requiring repairs were found.

March 22, 1978. PGandE made its final report to NRC Region V on the steam generator nozzle cracks and repairs, including repairs made during internal inspection. All steam generator nozzle to feedwater and main steam pipe welds were inspected.

April 17, 1978, PGandE made minor clarifications to its March 22, 1978 memo.

40. The backup investigations were extensive and were very conservative engineering and quality assurance actions. The extensive radiographic review re-examined hundreds of welds. The nozzle investigation was equally thorough. To remove any doubts regarding generic concerns, the feedwater pipes were cut apart from the feedwater nozzles to permit inspection of the internal surfaces.
  
41. There is no merit to the allegation regarding failure to file the proper reports or to perform a thorough evaluation. The examination was extensive, and all actions were reported to the NRC. No further corrective action is required.



42. The technical issues of Allegations #339, #354, and #355 are responded to separately.

NRC Allegation #339

It is alleged that:

I believe that a breakdown in Quality Assurance of construction has occurred [sic] because the welds had been accepted and had been put in service with out [sic] discovering the defects. (4/10/84 Lockert Aff. at 10.)

43. This allegation is in the context of comparing the examination results inside the steam generator nozzles to other examination results. After the singular crack and leak in FW 212, the subsequent extensive review of radiographs and the intensive internal examination confirmed the validity of the quality program.
44. The intensive examination of the nozzle inside surfaces was not originally planned or required. The methods used for these internal surface examinations were different from those external surface and volumetric examinations which had been specified and carried out. It is natural and expected that the different examination techniques reveal different types of discontinuities. The inside examinations were conducted at PGandE's direction as a prudent, responsible safety-minded owner and engineer. That these examinations revealed discontinuities in FW 197, 244 and 212 not previously revealed by Pullman inspection does not in any way imply a QA breakdown. PGandE reported the plan to

inspect these nozzles to the NRC and to repair as necessary. The repairs were also reported to the NRC. Conducting the costly activity of cutting apart pipes to inspect the inside diameter (ID) is also a positive indication that the PGandE Quality program was working. Records of the nozzle inspections that openly disclose the discontinuities are additional proof that the QA program was working.

45. The allegation is without merit, and no further action is required.

#### NRC Allegation #360

It is alleged that:

On my shift, there were only five weld inspectors with Level II stamps. In my own case at least, however, that was bogus because they didn't have any paperwork. I know, because I would have been involved with filling it out. (3/21/84 Anon. Aff., Attachment 12, at 2.)

46. The allegation is ambiguous, making it difficult to determine the allegor's actual concern. Contrary to the affidavit, from January to April 1983, all Howard P. Foley (Foley) Level II inspectors had the required paperwork to substantiate their qualifications.
47. If the allegor's concern is that his qualification status was improperly documented, the allegor has misunderstood the process defined in Quality Control Procedure (QCP) QCP 6-A, "Certification of Inspection Personnel." The individual inspector does not participate in generation of the actual certification record. Only the training coordinator,

Quality Control (QC) Manager, and Project Manager are involved in completing the certification paperwork. The certification record does have a signature block for the inspector to sign at the time of his yearly re-evaluation for certification or promotion to Level II status. This signature block may be what the allegor is referring to but it has no bearing on the actual certification. The inspector is not involved with completing the actual certification record.

48. If the allegor's concern is the number of Level II inspectors assigned to his shift, the concern is without merit. As discussed more fully in response to Allegations #371 and #372, the role of a Level II inspector is to review the inspection and reporting of the Level I inspectors. This practice is in accordance with ANSI N45.2.6. As long as the number of Level II inspectors is sufficient to review the work of the Level I inspectors, the actual number of Level II inspectors assigned to a shift is immaterial.
49. There is no technical or quality significance to this allegation, and no corrective action is required.

NRC Allegation #361

It is alleged that:

When I first hired in with HP Foley, the Manager, V. Tennyson, had me spend the first week reading the relevant procedures, I was then placed in the weld test

booth. My responsibilities were to certify welders by performing various welding procedures in various positions and fit ups.

I took my duties seriously, even though by procedure I wasn't certified to certify other welders. On the average I "looked-out" -- or flunked before the exam even reached the stage of a destructive test -- over fifty percent of the welders attempting to qualify, on at least one occasion. The flaws in their work were obvious and severe. They included excessive peening, which involves beating up the weld trying to get the drips off; massive undercuts and failure to follow the steps of the welding procedure they supposedly were being tested on. In some cases, I "looked-out" welders because they took the plates out of position to get a better angle for the weld. (3/21/84 Anon. Aff., Attachment 12, at 2-3.)

50. There are no code requirements for QC inspectors to be involved in welder testing, or for the personnel conducting the tests to be certified or qualified as welders or inspectors, nor must the personnel conducting the test be "certified to certify welders." However, Foley has an additional requirement in its procedures that the qualification of welders and brazers shall be witnessed by an authorized representative of the QC Department.
  
51. The fact that the allegor failed welders before their examinations ever reached the stage of destructive testing is evidence that inspectors were assigned tasks that they were competent to perform. The allegor, by his own statements, was an experienced welder capable of conducting and evaluating the results of welder qualification tests. The fact that only welders who had successfully completed their qualification tests

were allowed to make production welds verifies that this aspect of the quality program was properly functioning.

52. There is no technical or quality significance to this allegation, and no corrective action is required.

NRC Allegation #362

It is alleged that:

Even the welders who passed did not have unique stamps required to identify and trace their work, as required by the American Welding Society (AWS) code. A welder cannot receive electrodes to do the work, without his personal stamp. Instead, management instructed them to borrow one from the fabrication shop. I personally didn't tolerate this practice, and wouldn't let them go into the field or accept work until they obtained their own stamp. But the abuse went on all the time. When I told management that welders wanted to weld without stamps, the response was, "we don't have any." (3/21/84 Anon. Aff., Attachment 12, at 3.)

53. There is no AWS Code requirement that qualified welders have "unique stamps" to identify and trace their work. At Diablo Canyon, they are identified by multiple stamps which produce a welder certification code.
54. When a welder has successfully completed his qualification testing, he is assigned a welder certification code that becomes his unique identification. The identification code can be either a number, letter, or a combination of both and is used by the welder to identify his production welds and to obtain welding material.

55. The welder identifies his production welds by affixing his identification code adjacent to each weld. The welder uses individually lettered and/or numbered dies to produce his identification number. He does not use a single stamp or die consisting solely of his assigned identification code. The allegor apparently feels that each welder should have a single die to identify his work rather than use individually lettered and/or numbered dies. Since the end result is the same (i.e., the welder stamps his identification code adjacent to his work), the type of stamp used is not of quality significance.
56. The welder also uses his identification code, not his "stamp," to obtain welding material. Each time it is necessary for a welder to obtain electrodes, he identifies himself to the weld rod attendant by name and identification code. The attendant then verifies the welder's certification by checking the welder's certification list. The welder certification list identifies the welders who are certified and the processes to which the welder has been certified. By identifying the processes, the list limits the type of electrodes that may be distributed to each welder. The list is verified by QC to ensure that it is accurate and up to date. Since each welder has a unique identification code, it is unnecessary for each welder to have a unique stamp to obtain electrodes. Therefore, this concern has no technical or quality significance and no corrective action is required.

NRC Allegation #363

It is alleged that:

The procedure prevented the welders from taking the requalification test until they had been adequately trained in the welding process. However, management routinely allowed them to take the test daily until they passed. In one instance I flunked the same individual five times running. (3/21/84 Anon. Aff., Attachment 12, at 3.)

57. The allegor is correct in stating that the Foley Quality Control Procedures require welders to obtain orientation and training before taking their qualification test. Cases were identified as a result of Internal Audit PA 137 where additional training was not provided and these were documented on NCR 8802-942, Rev. 2. Beyond this, the allegation lacks detail to permit specific comment. A generalized answer is provided.
58. Most welders who have been sent by the Local Union to attempt to qualify as welders for Foley at Diablo Canyon have previously been qualified in accordance with the AWS Code. When a welder has failed the qualification test, the AWS Code permits an immediate retest consisting of two test welds of each type on which the welder had failed. On the retest, the welder must pass on all specimens to qualify. If the welder fails on the retest, he is dismissed and sent back to the Union Hall. By agreement, the Union will not send these welders out to be tested until they have demonstrated their capabilities at the Hall. By code, a single retest may be given, provided there is evidence that the welder has had further training or practice. The amount of training or practice is not specified and may be brief.

59. In certain cases, superintendents permitted welders who were certified to one process to practice another process in the weld test booths prior to qualification. A QC inspector was present during this practicing. This may be the incident the allegor observed. However, there is no procedure or code section governing practicing of a welding process prior to qualification. The investigation of this allegation has not identified any instance such as that complained of occurring during welder qualification. Therefore, the allegation has no technical or quality significance, and no corrective action is required.

NRC Allegation #364

It is alleged that:

Even though the QC Inspectors were supposed to participate in a continuing training program, I can only recall one instance where the inspectors were taken out of the field for a training seminar. That meeting was a fiasco, which suggests to me that personnel still may be reading the blueprints backwards. Round the end of January 1983 all Foley Inspectors attended a meeting to discuss the "interpretation of the Fuel Handling Building blueprints." This meeting was to clear up the confusion over whether they were to be viewed from the "inside looking out" or the "outside looking in." Nothing was resolved. In fact management conducting the meeting couldn't agree on how to view the blueprints. The inspectors were finally ordered back to work while the managers resolved the issue. I presume the confusion continued in the field, since training was not reconvened to resolve the question. (3/21/84 Anon. Aff., Attachment 12, at 4.)



60. The allegation is correct in stating that QC inspectors are required to participate in a continuing training program. QCP-6 requires inspectors to participate in training at least once every 3 months. Since the alleged was only employed at Foley as a QC inspector for about 3 months, it is not surprising that he does not recall participating in additional training classes.
61. Contrary to the allegation, the meeting the alleged attended was not a "fiasco." The meeting was conducted by Foley Engineering to explain some confusion that had resulted from the labeling on a set of drawings. Prior to the meeting, Engineering had determined how a user of the drawing was to orient himself when reading the drawing. At the conclusion of the meeting, it was felt that the information would be more effectively understood in a written form rather than relying solely upon an oral presentation to clear the confusion. The next day a written description of the information presented was handed out to QC inspectors and the confusion was resolved.
62. The allegation has no technical or quality significance, and no corrective action is required.

NRC Allegations #365 and #379

Both allegations relate to the same subject but are found in different attachments. The responses to each have been combined below.

It is alleged that:

Another practice that greatly disturbed me was lack of material traceability. Before a piece of metal was cut from the steel plate in the Turbine Building Fab shop, the original heat number from the steel plate should have been stamped onto the piece cut from it. This is important. Without this correct number on the material, the QC inspectors could not determine whether or not the steel had the metallurgical properties for the application on which it was used. Just one aspect of the significance is that welding by an improperly chosen process could result in degrading the strength of the steel.

In practice, however, traceability was lost after the material was received. The heat numbers were not consistently transferred. As a result, there were heat numbers on the material without supporting documentation to verify accuracy. In the field traceability was further lost, due to modifications on flatbar structural steel. Traceability was lost for the steel in the process. In the fuel handling building, heat numbers were even swapped. This occurred for knee braces on columns providing seismic support to hold up the walls. In fact, in that case the traceability records are backwards. The south side heat numbers apply to their counterparts on the north wall. Even though I and others identified this problem, no satisfactory solution was ever arrived at. Mr. Tennyson's efforts appeared half-hearted in that the "up to date" heat log we were supplied with had no control measures assigned to it. It would have been a simple task for anyone to alter this log. (3/21/84 Anon. Aff., Attachment 12, at 4-5.)

During my second period of employment I was encountered (sic) with a problem that specifically existed in the Fuel Handling Building although I'm sure it was widespread throughout the plant. This problem hinged upon the lack of an up-to-date "heat number" log. This log is required to certify the structural properties of the steel being utilized as hangers, knee braces, beams, etc. was comparable, as a minimum, to the properties specified in the Engineering specifications. This is significant because lack of this log could have lead (sic) to using improper material, which when welded according to the specifications called for on the drawing, could affect the structural integrity of the weldments. I approached my supervisors on this problem several times. Their response was that they would handle the problem and not to worry.

Their efforts seemed haphazard, as what was finally issued was an incomplete, and not an updated "heat log." This log was deficient in that there were heat numbers missing, log entries were incomplete and the log could not readily be confirmed to be a document that was under tight control. In my opinion, anyone could have made improper (sic) entries in this log and issued it to the field. There was no controlability or accountability on the log we used. (3/20/84 Anon. Aff., Attachment 11, at 6-7.)

63. Contrary to the allegations, the traceability of material, when required, has not been lost. All required supporting documentation is provided for all material prior to the material being released to production. Also, contrary to the allegations, the heat number traceability is not important to the metallurgical properties or selection of the welding process. The structural steels used at Diablo Canyon are not degraded by welding.
64. All material purchased and received has a heat identification number and purchase order identification number from the supplier when required. Identification markings are applied to material received by either painting on each item (i.e., structural steel) or when the material is bundled and strapped, by attaching an identification tag with the applicable heat number and purchase order number on it to the bundle.
65. QC conducts an inspection at the time the material is received to ensure that the material has the required marking or tags, the number on the material or tag is correct, and the material complies with the Purchase Order (PO). The inspector documents the information on a Receiving Inspection Report to provide objective evidence that the material meets

predetermined requirements such as specifications, codes, procedures, and standards.

66. After initial QC acceptance, the heat number or heat code is stamped or etched on the material by the responsible craft. Prior to final acceptance and release to construction, QC verifies that the correct heat number or heat code has been applied to each piece of material as required by the P.O. documents. It is only after this inspection process is completed that the material is released to the field.
  
67. Quality Control keeps a log of all material received which identifies the class of material, description, heat number or code and identifies the Purchase Order under which the material was received. When production personnel withdraw material, they are required to transfer the material identification from the parent stock to the withdrawn stock. QC, as part of its inspection activities, checks the material identification information on the finished work against the appropriate log. The Structural Steel Heat Number Log or the Etched Fitting Code Number Log are the documents used to maintain identification to the Purchase Order. If any discrepancies are identified, QC documents the condition on the appropriate documents. PGandE Quality Assurance (QA) has audited this activity and has not found any indication of attempts to falsify material traceability. For example, PGandE Audit No. 83549A identified two pieces of material for which Foley could not produce the documentation during the audit. Audit findings were written. Foley researched the items, found the documentation, and the audit findings

were closed.

68. All structural material purchased by Foley to be used in the Fuel Handling Building was specifically ordered for the Fuel Handling Building and was stamped "F.H.B." prior to release by QC Receiving. Therefore, the material installed has met all the required specifications as well as all the required quality requirements.
69. Contrary to the allegation, the heat log is not used to certify the structural properties of steel being used. The actual certification of material occurs through the process of procurement and receipt inspection discussed above. Since the heat log does not perform the function ascribed to it by the alleger, there is no basis for concern that improper materials could have been used because of defects in the heat log.
70. The alleger further claims that the heat logs used by the inspectors were inaccurate and incomplete. The controlled heat log is maintained by the QC receiving group that is responsible for keeping it current and up-to-date. All other copies of the log are for "Information Only" and are used as references by QC inspectors. These information-only copies are not controlled and could be incomplete. However, if the inspector attempted to rely on an incomplete heat log to perform an inspection, he would be unable to identify the material on the incomplete log and would be required to reject the material in the field because it would not be in the incomplete log.

71. Finally, the alieger contends that heat numbers on steel used in the fuel building were marked backwards with the numbers of the north side of the building being used on the south side and vice versa. Contrary to the allegation, the heat numbers on the material are not backwards. There is no requirement that material with a certain heat number be installed in a certain location. The design specifies only material type and size in a certain location, not the heat number.
72. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegation #366

It is alleged that:

Around March 1983, I was assigned to inspect the addition of I-beams and clips to one of the Reactor Coolant Pumps. These additions were necessary to provide seismic support for the pump. While I was inspecting the additions I noticed a stainless steel T-section of pipe, under the Reactor Coolant pump on the 125 foot elevation, that had a 4 inch linear undercut. Per the procedures in use at the time, there could be no undercut on that piping. I brought this to the attention of my supervisor immediately. His response was "mind your own business ..., it's Pullman's responsibility." This didn't wash with me, so I informed a PG&E employee whose responsibility was to document problems. I was informed PG&E performed some Ultra-Sonic Testing of the pipe and found the wall thickness to be insufficient in the areas of the weld in question. However they decided not to fix it, perhaps because the weld was inaccessible from the outside. When I left in April 1983 the weld had never been repaired. (3/21/84 Anon. Aff., Attachment 12, at 5-6.)

73. In the absence of more specific data, it is believed that the allegation relates to a condition that was pointed out during the NRC-sponsored plant tour conducted the night of April 11, 1984. The day after the tour, this weld was inspected by two welding engineers who are AWS Certified Welding Inspectors. The alleger apparently thought that a slight difference in thickness between the flattened weld crown and pipe was an undercut. However, the difference was caused by grinding the weld nearly flush with the pipe in preparation for inservice inspection. The welding engineers verified that there was no excessive grinding. This is clearly identifiable because the areas of concern are discolored by welding heat tint, whereas the ground areas are bright metal. There was no undercut.

74. The welding engineers also identified a grinding mark in the pipe fitting just below the field weld which was not an undercut. The depth of the area in question has been determined by measurement to be 0.031 inch deep. Engineering review has determined that the 10 inch diameter schedule 140 pipe has a nominal wall thickness of 1.000 inch with a manufacturing tolerance of minus 12.5%, which may result in a minimum wall thickness of 0.875 inch. The design requirement for wall thickness for this line, based on pressure and temperature considerations, is 0.748 inch. As stated above, the depth of the ground area is 0.031 inch deep. Based on a worst case of 0.875 inch, minus 0.031 inch, a reserve margin of 0.096 inch still exists above the minimum design wall

thickness requirement. The mark does not represent a sharp discontinuity and is acceptable as is. Therefore, this allegation has no technical merit.

75. The allegor stated that he discovered a possible discrepancy in work performed by Pullman. He reported this to his supervisor, who allegedly shrugged the problem off as Pullman's business. The inspector then reported the problem to a PGandE employee. To this point, the inspector had performed his job as he should have done by reporting the problem to his supervisor. The supervisor, however, allegedly failed to report this problem either to Pullman QC or PGandE QC. If this were so, the supervisor would have been in error. Foley responded to the issue of QC inspectors finding possible discrepancies that fall outside their normal scope of work in a Foley memo dated July 11, 1983, to all QC inspectors from Quality Director Rick Wilson. The memo was discussed with all QC inspectors at a general meeting conducted by Mr. Wilson. Copies were made available in each trailer, and the memo was posted in all QC trailers to ensure that inspectors were made aware of the reporting process. Inspectors were instructed to note their quality concerns on the form provided on the reverse side of the memo, which was addressed to the Assistant Project Superintendent, D. A. Rockwell.
76. Although the allegation pointed out a legitimate concern, the matter has been addressed from both a technical and quality perspective and there is no need for further action.



NRC Allegation #367

It is alleged that:

Prior to my leaving Diablo Canyon, I discovered that the "Guided-Bends Test Machine" did not satisfy AWS requirements with respect to operating tolerances between "shoe and die" in the hydraulic jack. The rollers were also extremely sloppy. To some this may not seem significant; however, if this machine is not set-up (sic) properly it could artificially qualify "bad" weld test coupons. This machine was apparently worn out. I identified this to my supervisors and was told to "quit being picky." (3/21/84 Anon. Aff., Attachment 12, at 6.)

77. The purpose of the guided-bends test is to bend a welded sample to an extreme U-shaped configuration to test the adequacy of the weld. The test machine identified in the allegation is a very simple device consisting of a movable plunger and a U-shaped die. The machine is operated by a manual hydraulic jack.
78. Contrary to the allegation, the AWS Code does not provide operating tolerances between "shoe and die" in the hydraulic jack. The code only requires that the plunger force the specimen into the die until the specimen becomes U-shaped and that the weld and heat-affected zones be centered and completely within the bent portion of the specimen after testing. Compliance with the code is met so long as the machine deforms the test specimen far beyond its yield point. Since the particular machine was capable of bending the specimen beyond the yield point to a U-shape, there is no technical merit to this allegation, and no corrective action is required.

NRC Allegation #368

It is alleged that:

The final insult to injury occurred during my exposure to the "Quick Fix" program. After I would inspect a strut, or other item I would explain to a "Quick Fix Engineer" what I felt needed to be done. Usually within half an hour he would be back with the requisite paperwork for the "quick-fix". Engineers approved such significant modifications as the addition of T bars and changes that effectively redesigned the wall plates. The expediency in which this paperwork appeared assured me that it could not have been reviewed by QA or had any serious engineering analysis. (3/21/84 Anon. Aff., Attachment 12, at 6.)

79. The term "Quick Fix" has been used with reference to the Pipe Support Design Tolerance Clarification (PSDTC) Group. However, the Foley "Quick Fix" program and the PSDTC are separate and distinct and are not to be confused with each other. The "Quick Fix" Program at Foley was in effect from March 1, 1983 to April 15, 1983. The practice used by Engineering during the time frame of the allegation to accept "Quick Fixes" submitted by Foley were previously investigated by Diablo Canyon Project (DCP) Quality Assurance (QA). The approval process was found to be in noncompliance with approved Engineering Manual Procedures. As a result, the program was ended on April 15, 1983. All changes issued as Civil Quick Fix Design Changes (QFDCs) were reviewed by Engineering to establish which changes required the issuance of a Design Change Notice (DCN). Where required, DCNs were issued to formally accept the changes submitted on the QFDCs. (Reference PGandE Engineering Discrepancy Report 83-021-S). In summary, this item was previously discovered, investigated, and resolved through the normal functioning of the DCP QA Program, and no further action is necessary.

NRC Allegation #369

It is alleged that:

Also, the professional codes that represent the legal basis for our conclusions frequently were not available. I attempted to research them, but routinely these documents were "lost" when I looked for them. (3/21/84 Anon. Aff., Attachment 12, at 7.

80. The allegation contains insufficient information to address the specific occasions when such documents might have been lost. As a general rule, copies of all applicable codes are kept by the QA departments, QC departments, engineering departments, and document control groups of both PGandE and Foley. The inability of the alleger to locate copies for whatever purpose leads one to question either the seriousness of his search or the truthfulness of the allegation.
81. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegation #370

It is alleged that:

In some cases I could not even find up-to-date copies of the "quality control procedures." When quizzed about their locations, my supervisors would reply that they were around somewhere and would promise to locate them for me. In the interim I was instructed to go back to work. In many cases they never found the documents for me. It was obvious to me they wanted me to know just enough to do my job and not enough to do it well. (3/21/84 Anon. Aff., Attachment 12, at 7.)

82. The allegation lacks sufficient information to address any specific occasions when this may have occurred. Since the procedures were available for everyone to use, possibly another individual was using the binder that contained the procedure the alleged sought. If the alleged needed to see a procedure for reference, he was free to go to the Document Control Department and use its set of procedures for reference. The latest revisions of quality control procedures are controlled, issued, and available through the Document Control Department. Document Control maintains a copy of the latest revisions for anyone who needs a copy. Document Control's procedure manuals are not allowed to be removed from the department and are always available for reference.
83. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegation #371

It is alleged that:

I was employed by the H. P. Foley company at the plant from September 1980 to April 1981, as an electrical inspector, and again from January 1983 to April 1983 as a Civil QC inspector. During these periods my position was that of Quality Control (QC) Inspector assigned to inspect welding performed on seismic qualified support structures in areas such as the Fuel Handling Building. I was certified to level I. As a level I inspector I was to operate in conjunction with a Level II inspector, because a level I inspector was not qualified per ANSI N 452.6 (sic) (the governing Quality Assurance requirements for Inspectors) to accept or reject the welding performed by the crafts.

This above description identifies how the system was supposed to function in theory. However, in fact it did not function in this fashion. The only time a level II inspector ever second checked my inspections was if I found something discrepant and was unsure of what procedure should be utilized to remedy the situation. In these instances I would have to go and find a level II inspector and get him to look at the problem. In other words, I was qualified to accept work on my own but not to reject it. (3/20/84 Anon. Aff., Attachment 11, at 1.)

84. There is no code, specification, or procedure which requires Level II or III inspectors to witness each inspection performed by a Level I. The Level I inspectors in the alleged time frame were appropriately assigned to perform work under the direction and monitoring of an assigned Level II inspector. A Level II inspector may or may not have witnessed each of the inspections performed by the Level I. The determination of whether to actually view the inspection or only review the results was solely the responsibility of the Level II inspector since he was ultimately responsible for final QC acceptance. Since the Level II was not required to witness the actual inspection activity in order to accept the results, his signoff cannot be considered falsification of documentation.

85. The allegor has misinterpreted the requirements of ANSI N45.2.6. Pursuant to ANSI N45.2.6, a Level I is authorized to record inspection, examination, and testing data, and to implement inspection, examination, and testing procedures. To implement the procedures, the inspector must actually perform the inspections.

86. Level II inspectors are authorized to evaluate the validity and acceptability of inspection, examination, and testing results. It is acceptable for a Level II inspector to monitor the Level I inspector's work. The evaluation can be accomplished by reviewing the inspection data, observing the Level I inspector's work, or reinspecting each weld inspection performed by a Level I. The Level II is responsible for evaluating the work of the Level I to the extent necessary to satisfy himself that the work of the Level I is acceptable. Since all Level I work at Diablo Canyon is evaluated by a Level II inspector, ANSI N45.2.6 requirements are met.
87. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegations #372, #374, #380 and #381

The above allegations relate to the same subject but are found in different attachments. The responses to each have been combined below.

It is alleged that:

The inspection reports that I submitted on a daily basis required that a level (sic) II sign for the results. I do not know if all or any of my reports were countersigned by a level (sic) II inspector. If in fact they were countersigned, it would have been the result of the level (sic) II signing because he had to, not because he had personally verified the welding or my inspection of the welding. (3/20/84 Anon. Aff., Attachment 11, at 2.)

At one point in time during my second period of employment there were approximately 30 inspectors on night shift and at least that many on the day shift. Of these inspectors less than 50%, in my estimate, knew how to weld. I find this to be puzzling since we were inspecting welding. In fact, at one time I was inspecting the work of 14 welders on one shift. (3/20/84 Anon. Aff., Attachment 11, at 4-5.)

I was employed at Diablo Canyon for a period of approximately four months, (January 1983 until April 1983), as a Civil Quality Control Inspector. As a Civil QC Inspector I routinely inspected welding and performed non-destructive testing of welds performed on Seismic Category I structures in both the Fuel Handling Building and inside containment.

Even though I have over thirteen years welding experience and am a certified structural steel and pipe welder I was only qualified to a Level I inspector. In accordance with the Quality Assurance/Control procedures that I read as part of my indoctrination, I was not allowed to accept work based on my inspection. The procedures required a Level II (senior) Inspector to sign for acceptance. I complained on numerous occasions about the fact that I was inspecting welds that I was not certified to inspect. The interim response was to have a Level II inspector cosign my work after I turned in the inspection although he had not looked at the welds. This illustrates a widespread problem of falsified inspection records. The final response of supervision was to upgrade my certification to that of a Level II inspector. (3/21/84 Anon. Aff., Attachment 12, at 1.)

Most of the weld inspectors did not have my background in the trade. In fact, there only were isolated instances where the inspector knew how to weld at all. That can compromise the quality of inspections; it can't all be taught by books and pictures. You have to be able to understand the process. From my own observations, up to 30% of the weld inspectors weren't qualified. I base that conclusion on the poor quality of the work they accepted. This included welds where the slag hadn't been completely chipped off, making it impossible to have actually visually checked the weld quality. In other cases they could not translate the blueprints. In still other instances the unqualified inspectors erroneously rejected acceptable work, and on the basis of unexplained vague terms such as "bad weld profile." This created a backlash from the production department. (3/21/84 Anon. Aff., Attachment 12, at 2.)

88. Both allegers assume that an inspector must know how to weld in order to be a qualified weld inspector. Although this is the opinion of the allegers, there are no code or specification requirements specifying that QC inspectors know how to weld. Inspectors execute inspection activities to verify conformance with documented instructions and predetermined requirements in procedures, specifications, and drawings. All acceptance criteria are contained in these documents. The QC inspector determines whether or not the component meets the inspection criteria based on the criteria and not on whether he knows how to weld.
89. There is no code, specification, or procedure which requires Level II or III inspectors to witness each inspection performed by a Level I. The Level I inspectors in the alleged time frame were appropriately assigned to perform work under the direction and monitoring of an assigned Level II inspector. A Level II inspector may or may not have witnessed each of the inspections performed by the Level I. The determination of whether to actually view the inspection or only review the results was solely the responsibility of the Level II inspector since he was ultimately responsible for final QC acceptance. Since the Level II was not required to witness the actual inspection activity in order to accept the results, his signoff cannot be considered falsification of documentation.
90. The allegation is correct that there were some inspectors who were not qualified in accordance with ANSI N45.2.6. However, this matter has



been identified and reported in PGandE Letter No. DCL-84-065 dated February 17, 1984.

91. The allegation has no technical or quality significance and no further corrective action is required.

NRC Allegation #373

It is alleged that:

I have read the response from PG and E to the NRC regarding certification of Foley inspectors (PG&E letter No: DCL-84-065)...

I find this letter could not be further from the truth. To illustrate, when I was first hired, on both occasions, I would spend the first several days reading the various procedures. The rest of the week consisted of general orientation tours through the plant with a senior inspector.

By the end of my first week I was turned loose and assumed responsibilities as a working inspector accepting welds on my own, without a level II inspector in attendance.

The above example illustrates what the training to perform my duties consisted of. This practice was Standard Operating Procedure for the H P Foley QC department. At the end of our "on the job training" period we were not tested to determine our deficiencies, etc. To my knowledge other inspectors did not receive any more extensive training than I myself received. Supervision used no particular method to determine what, if anything we had learned. After reading the applicable procedures, we were handed a form to sign stating we had read the documents. We then were placed in the field with a senior inspector for a couple of days. It was left up to the individual as to what was learned in the "picking of the brains," hands on training. We were then turned loose to fulfill the requirements of a QC Inspector on our own. For an inspector that had an intense background in welding, this practice may be considered to be an acceptable "on the job" training program. However, as evidenced by my first

employment not all the inspectors hired had the background to support the duties they were performing. However when an individual is expected to not only realize his own deficiencies, but correct them on his own, while still performing his job, something has to be sacrificed. In my judgment, this training program left me, and a large number of inspectors, unprepared for the responsibilities I was assigned. (3/20/84 Anon. Aff., Attachment 11, at 2-4.)

92. QC inspectors are not normally given tests at the end of their on-the-job training period. There are no requirements in the specifications, codes, or procedures to perform such testing. ANSI N45.2.6 on "Qualifications of Inspections, Examinations and Testing Personnel for Nuclear Power Plants" describes evaluation of inspection personnel in terms of having capabilities to perform inspections, examinations, and tests, and having appropriate education and experience levels.

93. There is no need to test personnel as in a conventional schoolroom. The training is performance and result oriented. Testing is not the most appropriate method of determining the qualifications of the inspector. Therefore, although the allegation is essentially true with respect to the lack of testing, any weaknesses in the training of structural welding inspectors during the time frame of the allegation were previously recognized and addressed by PGandE (Reference PGandE Supplemental Response to March 29, 1983, Notice of Violation). Additional training was performed and additional experienced inspectors were hired. This allegation contains nothing new, and no further action is required.

NRC Allegation #375

It is alleged that:

The lack of a reliable Quality Control program can be further illustrated by my supervisions practice of "frowning" upon the use of red tags ( QC hold tags), because (sic) the production schedule. (3/20/84 Anon. Aff., Attachment 11, at 5.)

94. The allegation lacks sufficient information to respond to a specific incident. However, there was a period of time when the use of red tags was being abused by the QC inspectors. Inspectors were utilizing the red tag while work was in process on conditions that were correctable prior to the time the work was completed and ready for inspection. Inspectors were instructed not to issue red tags on work in process unless a true nonconformance existed.
95. In general, when an inspector identifies a discrepant condition or has a question with respect to the interpretation of inspection criteria, he can issue either a Nonconformance Report (NCR), an Inspection Report (IR), or note the discrepancy on the inspection checklist. By definition, a nonconformance is a deficiency in a characteristic that deviates from the design, specifications, or procedures and renders the quality of the item or document to be unacceptable or indeterminate. On the other hand, an IR is issued where a discrepant condition exists but it does not meet the definition of a nonconformance. The determination of whether or not to issue an IR or an NCR is often left to the judgment of the inspector. If the inspector determines that an NCR must be written, he is required by procedure to hang a red tag on the work. In

other cases, a red tag may be used by an inspector when he feels it is necessary to control the work such as when further construction might interfere with proper correction of an identified discrepancy. A red tag represents the most drastic response the individual QC inspector has available to identify a condition and should only be used if the condition fits the definition of nonconformance, or if it is needed to control the work. In other cases, there are adequate methods and controls to identify and resolve conditions that need additional attention but do not require work stoppage. At no time have QC inspectors been advised not to use the red tag procedure where the situation requires a red tag. However, inspectors were advised not to hang red tags when the condition did not warrant the use of a red tag.

96. The allegation has no technical or quality significance and no corrective action is required.

#### NRC Allegation #376

It is alleged that:

Instead of using the system established by QA/QC procedures, management advocated that the QC inspectors perform "complimentary (sic) inspections". This process involved the inspection, identification of problems and resolution to any problems prior to the "official inspection" by the QC inspector. The problems posed by this process were that, 1) it required the inspector to violate the procedure (complimentary (sic) inspections weren't allowed); 2) there was not an adequate paperwork trail to clearly identify problems and their resolutions; and 3) this process totally bypassed quality assurance (QA) and Engineering input (sic) to the resolutions in some cases." (3/20/84 Anon. Aff., Attachment 11, at 5.)

97. The allegation is without merit. Management has never advocated the use of "complimentary (sic) inspections" in lieu of holdpoint inspections required by QA/QC procedures. Both types of inspections are mutually exclusive. The only required QC inspection occurs at the holdpoint designated on the work process traveler. At this point all aspects of the work are inspected and accepted or rejected. Complementary inspections occur at the request of craft personnel prior to completion of the work and not at any designated stage of completion or holdpoints to assist craft personnel in constructing an acceptable product. Therefore, it is impossible to substitute one for the other.
98. There is nothing in any code, specification, or procedure forbidding complementary inspections. If there is a condition that can be corrected in-process prior to completing the work, it is permissible for QC to point it out to production in order to correct it as the work progresses.
99. If the condition identified is a nonconformance, a QC inspector is required by procedure to generate the same level of paperwork as would be required if the condition was observed at a formal inspection holdpoint. In most cases, a condition observed as a result of a complementary inspection can be corrected in the normal course of construction so as not to require rejection of the completed work.

100. Contrary to the allegation, the use of complementary inspections demonstrates a commitment on the part of management to encourage production and quality personnel to work together to ensure the construction of a quality product and not an attempt to avoid required QC inspections.

101. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegation #377

It is alleged that:

Another instance of the inadequacy of the program became apparent when I discovered that an electrical raceway support in the cable spreading room (which contains Class I electrical power supplies) was supported by a piece of double unistrut (a double U-shaped type of steel support element,) that had been improperly cut and installed. The problem in the installation centered on the fact that the piece of unistrut had been cut in-between the tack welds (spaced 4 inches apart throughout the length of standard unistrut) such that the only thing supporting the weight of the raceway was the galvanized dip. I researched through the files and found that this problem had been identified previously about two years before. I felt that I should bring this to the attention of my supervisors. Their reaction was to not worry about it, and that they were aware of it. To my knowledge the condition was never remedied prior to my leaving the site. This is a significant problem because this type of unistrut installation could exist throughout the plant. (3/20/84 Anon. Aff., Attachment 11, at 5-6.)

102. In 1979 Foley and PGandE discovered that stitch welded double strut could be cut in such a manner that a condition could occur whereby the

cut piece would not have any weld material present. The problem was investigated by PGandE and Foley to determine if such an occurrence could affect the Class I electrical raceway support where the double strut was used.

103. Samples of the double strut were obtained from each of the main material storage areas inside and outside the plant. Each sample was measured to determine the average distance between the stitch welds. Each side of the double strut was welded at a distance between 9 to 11 inches joining the back-to-back Unistrut channeks with stitch fillet welds. The welds on the opposite sides were staggered such that the maximum distance between weld points from one side to the other was 4 to 4-1/2 inches.
104. The electrical raceway support design drawing #050030 was reviewed and it was established that the minimum length of double strut called for by the design was  $10 \pm 1$  inches. Although it was physically possible to cut the double strut in such a way as to have a 4-inch piece without a stitch weld, the design is such that no double strut of that size is specified.
105. Since the installation of all double strut was inspected to the design drawing and found acceptable, PGandE and Foley agreed that no design deviation existed and no corrective action was necessary.

NRC Allegation #378

It is alleged that:

In light of the many discrepancies that I witnessed while I was employed at the plant I found it appalling that the company never provided me with either the support that I needed to perform my duties, nor did they provide me with adequate training. At times the procedures I was expected to enforce were ambiguous, or vague at best. I was never instructed on their use, I was just expected to make myself as familiar with them as I found myself comfortable with. To me, my supervisors opinion on the procedures was one of tolerance of their existence, instead of being the Bible we prescribed (sic) to. They displayed this attitude by refusing to correct earlier identified problems when I "rediscovered them." This is also demonstrated by their preference for performing complimentary inspections in violation of the procedures. Their attitude was more one of "do as we want" rather than by the procedure. In fact I can not recall ever being shown where Non-conformance Report forms were kept, let alone being instructed on how and when to use them. (3/20/84 Anon. Aff., Attachment 11, at 6.)

106. Based upon the information provided in the affidavit and a review of Foley records, only one individual's employment history in terms of dates of employment and job assignment matches the information contained in the affidavit. Contrary to the allegation, the individual received extensive training during both periods of employment.
107. During his first period of employment, the allegeder received extensive on-the-job training in the use of Quality Control Procedures for electrical inspection of raceway and supports, electrical equipment, and associated welding. In fact, he received more than 90 days of on-the-job training, which is twice the amount required by procedure.



108. During the second period, the alleged received documented training in 10 CFR 50, Appendix B, PGandE Specifications 8802 and 8807, and the following Quality Control Procedures:

QCP-3	"Processing and Control of Deviations and Nonconformances"
QCP-5A	"AWS D1.1 Welding (Structural Steel)"
QCP-7	"Installation of Electrical Equipment"
QCP-9	"Installation and Inspection of Stud and Shell Concrete Expansion Anchors"
QCP-10	"Power Control and Signal Wires"
QCP-10A	"Installation of Coaxial and Triaxial Cables"
QCP-11	"Cable and Wire Terminations"
QCP-17	"Initiation of Work"
HPF-E1	"Installation and Documentation of Non-Class I Systems ECO E-182 and E-161"
HPF-E2	"Installation and Documentation of Fire Alarm, Cardox System, Deluge System and Smoke Detectors"
HPF-E3	"Installation and Documentation of Non-Class I System ECO E-203"
HPF-E4	"Installation and Documentation of Non-Class I System ECO E-194"

109. The alleged's expectation that his training would consist of more is surprising since the extent of his training is consistent with the type of training received throughout the nuclear industry.

110. The remainder of the allegation is speculative at best and does not provide adequate information to formulate a response.

111. The allegation has no technical or quality significance and no corrective action is required.

NRC Allegations #382 and #402

It is alleged that:

34. In some cases, illegally-performed informal weld repairs covered up initial deficiencies whose effects will remain as dormant hazards. To illustrate, crews welded over broken tack welds, which is illegal under the code and specifications. You have to fix or remove a broken tack weld. If you weld over it as is, there is no guarantee that the broken tack weld will be completely incorporated into the new weld. Cracks from the tack weld can then repropagate into the new welding. (Hedrick Aff. at 10.)

33. The effect of uncontrolled weld repairs was to destroy weld quality in some cases. For example, use of the wrong weld technique created uneven stress on certain stiffeners. This created so (sic) much excess tension that there were instances where people working in the vicinity could hear the welds pop. (Hedrick Aff. at 10.)

112. Welding technique, by itself, does not cause uneven stress problems and certainly, by itself, cannot avoid cracking problems in highly restrained joints. Difficulties in welding restrained weld joints at Diablo Canyon were identified in NCRs. Welding sequence changes and weld size changes are frequently necessary to weld highly restrained joints. Broken tack welds are frequently corrected by making larger size tack welds.

113. The welds described by Mr. Hedrick were made on stiffener plates which were installed on the exterior columns of the turbine building. The stiffeners were installed inside flanges on heavy columns with groove welds on three sides after tack welding of the stiffener plates to the columns. The tack welds (erection aids) broke (popped) on the side opposite the production weld being made. These tack welds and the final welds were addressed on PGandE NCR DCO-79-RC-002 and Guy F. Atkinson Company (GFACo) NCR 245. A memorandum (Request for Modification) from GFACo to PGandE, dated December 6, 1978, described the breaking of tack welds on these stiffener plates and the requirement to repair all cracked tack welds before incorporation of the tack weld into the final weld. The accepted solution of this tack weld cracking problem for new welds was to tack weld the stiffener plates on the back side so that the tack weld was not included in the production weld and so that the tack weld appearance met AWS D1.1 code. In addition, existing tack welds were repaired so that they could be included into the production welds. There were no illegally performed informal weld repairs since tack welds and repairs were performed in accordance with approved procedures. Repair work on the cracked tack welds that were identified in NCR 245 required QA documentation. Verification of the corrective action including documentation was signed off on the NCR. There is no evidence to indicate that there were any tack welds that were not repaired as required by GFACo procedures and AWS Code.

114. No further corrective action is required.

NRC Allegations #383, #384, and #385

It is alleged that:

35. For an extended period during 1979 the inspection program only poorly enforced the preheat specification program, when at all. The problems identified were due to the initiative of the night shift inspectors. (Hedrick Aff. at 10.)

36. Our initiative was only partially successful. While the inspection procedures for preheat treatment were upgraded, the change only applied prospectively to work in progress. Any welding already done and inspected without preheating was home free. (Hedrick Aff. at 11.)

37. I was concerned about inadequate preheating for steel greater than two inches thick. The specs require preheating when the steel is more than 1.5 inches thick. Unfortunately, in some cases there was no evidence of preheating or of any temperature monitoring in other instances. (See e.g., January 9, 1979 swing memorandum enclosed as Exhibit 10). (Hedrick Aff. at 11.)

115. Contrary to these allegations, preheating, as required by PGandE specifications, GFACo welding procedures, and the AWS D1.1 code, was always required for Specification 5422 work performed by GFACo. The PGandE specifications required that welding be in accordance with AWS D1.1, 1977, which requires for plate thickness greater than 1-1/2 inches and up to 2-1/2 inches, a minimum preheat temperature of 150°F. For plate thickness greater than 2-1/2 inches, a minimum preheat temperature of 225°F was required. In January 1979, GFACo started welding the thicker sections and preheating was monitored with Temp Sticks to ensure that procedure requirements were met. GFACo and PGandE QC inspectors and all welders were issued Temp Sticks to assist in ensuring that the proper preheat temperatures were met.

116. Preheat is specified in order to help minimize rapid cooling of a weld which could induce cracking in the weld. Should cracking occur, it would generally be detected during visual inspection, liquid penetrant, MT or ultrasonic testing. Inspections to date have not indicated a cracking problem.
117. Mr. Hedrick's Exhibit 10 indicates that the PGandE inspector was performing his inspections as required by PGandE to ensure that GFACo QC inspectors and production personnel were following the established procedures. Contrary to the allegation that there was inadequate monitoring of preheating, this demonstrates the effectiveness of the additional inspection by PGandE.
118. No further corrective action is required.

NRC Allegation #386

It is alleged that:

38. There was a significant problem with lack of weld rod control. In one instance in February, 1979, over 16 weld rods were issued and not returned. In addition, 80 stubs could not be accounted for. (See February 9, 1979 swing memorandum to Terry Walker, enclosed as Exhibit 11.) (Hedrick Aff. at 11.)

119. Welding electrode control (i.e., issuance of welding electrodes and return of unused electrodes and electrode stubs to the issue station for accountability) was an acknowledged problem during the initial months of

the GFACo contract. GFACo NCR 011 identified incomplete "Welding Electrode Issuance Records" on April 11, 1978, and recommended a change to GFACo Procedure QCP-4 to include issuance of welding electrodes only by GFACo QA personnel. Another GFACo NCR (035) identified uncontrolled welding electrodes and stubs in the work area on May 11, 1978, and placed all welding on hold. QCP-4 was revised by GFACo to incorporate the requirement for QA personnel to issue welding electrodes. The revised QCP-4 was approved by PGandE. Welding resumed on May 12, 1978.

120. Further, in the same time period, an NRC "Notice of Violation" was issued for nonconformance with welding electrode control procedures, and PGandE issued Minor Variation Reports (MVRs) relating to unused weld rods not controlled (electrodes and stubs in the work area and excessive issuance time). However, a subsequent NRC inspection made on May 30-June 2, 1978, indicated that no further problems with weld rod control were identified. This demonstrates the effectiveness of the PGandE and GFACo QA/QC programs in identifying and correcting this deficiency.
121. Subsequently, there were occasional problems relating to weld rod control which were identified through GFACo and PGandE QA/QC audits and field inspections and routine review of documentation. Welding electrode control did not present a problem affecting the weld quality since welders were issued new electrodes at the start of each shift and after four hours. Isolated instances of nonreturn of unused electrodes

and stubs at the end of each four-hour period as required by GFACo procedures continued into 1979. However, onsite testing documented in PGandE MVR C-865, dated January 22, 1979, indicated that the four-hour period was conservatively set since weld strength or ductility would not be affected by exposure of electrodes to atmospheric conditions for up to 24 hours.

122. No further corrective action is required.

#### NRC Allegation #387

It is alleged that:

39. Management introduced errors into the blueprints by switching identificationCode (sic) about 20-25% of the way through the Hosgri modifications on the turbine roof and then failing to keep track of the changes. In some cases, the blueprints were read backwards. In fact, sometimes the drawings themselves got the locations backward. At best there was confusion. To illustrate this phenomenon, an A-G system was changed to a B<sub>12</sub> - B<sub>1</sub> system, with measurements from opposite starting prints. (sic) A July 26, 1978 memorandum is enclosed as Exhibit 12. (Hedrick Aff. at 11.)

123. During the initial months of the GFACo contract, emphasis was placed on the preparation of inspection procedures (by GFACo Quality Assurance) and on preparation of joint detail drawings (by GFACo Project Engineering) as design drawings were received from PGandE. As field work started in the turbine building (i.e., within the first few bays), the complexity and scope of modifications increased. PGandE drawings used the structural column lines (A-G and 1-35) as a general basis for

location within the turbine building. Construction detail drawings, prepared by GFACo Project Engineering, used the designation B1 to B12 as a subclassification of the major grid lines. In order to explicitly identify the joint locations and to avoid confusion in tracking the status of inspection for roof truss connections, GFACo Quality Assurance established an improved location identification system.

124. When GFACo Project Engineering prepared the detailed construction drawings, a Quality Assurance Engineer would assign location/documentation package numbers as a basis for inspection control. When the identification system was initiated in July 1978, there was a transitional period in which work-in-progress was defined by the two interrelated identification systems. As would be expected, unfamiliarity with the detailed identification system caused some initial confusion as demonstrated by Mr. Hedrick's memo in his Exhibit 12. This was not, however, a situation that continued for an extended period.
125. PGandE believes Mr. Hedrick's allegation that "blue prints were read backwards" relates to the aforementioned identification designation for turbine building work. However, the allegation is not specific enough to address in any detail. PGandE knows of no drawings that were incorrectly drawn. GFACo was responsible for preparing construction detail drawings from PGandE design drawings. Prior to their use in the field, these detailed joint drawings were reviewed by PGandE General



Construction to ensure that design intent was implemented. This review further ensured that any potential confusion in view convention in PGandE drawings did not result in improperly installed or modified structural steel.

126. No further corrective action is required.

NRC Allegation #388

It is alleged that:

40. I am not confident that bolts were properly torqued as required by specifications, because operators installed them by "feel". Inspectors had no way to verify the initial starting point and snugness before the bolts were turned. Some bolts were so over-torqued that they broke. I know that others were too loose, because they were removed so easily during subsequent rework. (Hedrick Aff. at 11.)

127. It appears that the allegor is not familiar with the project specifications or the techniques for installing structural bolts that are specified in the AISC Code. PGandE specifications (e.g., 8833, 8833X, 8833XR, and 5422) require structural bolts to be installed in accordance with the AISC Code. One method approved by the AISC Code is "turn of nut tightening." This allegation indicates that the turn of nut tightening was performed. This method requires bolts to be initially tightened to a snug tight condition (achieved by "feel" which is defined in the code as "the full effort of a man using an ordinary spud wrench"), then rotated 1/2 to 3/4 of a turn beyond the snug tight condition. In addition, Project specifications require the torque on a

minimum of 10% of the bolts or at least two bolts in each connection to be verified using a calibrated wrench. If the torque verification finds any bolts installed at torques less than AISC specifications, all bolts in that connection are verified with the calibrated torque wrench. This ensures that the bolts are not installed "too loose."

128. A number of A-490 high strength bolts were overtorqued during GFACo work on Specification 5422. This was addressed in GFACo NCRs 043, Rev. 1 and 248. All overtorqued bolts were replaced with new bolts. Breaking of the bolts resulted during the torque verification. An improperly calibrated torque wrench had been used which resulted in overtorquing the bolts. This issue was identified and corrected by the QA/QC program.
129. Structural bolts have been properly installed and no corrective action is required.

NRC Allegation #389

It is alleged that:

41. During the spring of 1978 management improperly installed three caissons during the Hosgri modifications for the turbine building in holes that had about 12 feet of mud and water in the bottom of the 65-85 foot caisson holes. There was supposed to be granite for bedrock. The holes quickly filled up with mud and water, because they were in an underground stream bed. This led to a Mexican standoff as the job was stopped for over two weeks. In the end PG&E management decided to just install the reinforcement bar cages and fill the holes with concrete. The excuse was that the hole was too deep to clean safely. The particular caissons are located toward the center of the turbine building. (Hedrick Aff. at 12.)

130. Contrary to this allegation, all caissons were properly installed under close supervision of both GFACo and PGandE personnel. These caissons were designed as friction-type piles, not as end-bearing piles, for installation in the rock sandstone strata that exists at Diablo Canyon. PGandE was aware that there is no granite located at the site (Ref. FSAR Section 2.5). Concrete was not placed in 12 feet of water and mud in the bottom of holes as alleged; this material was removed. The depth of the caisson holes varied from approximately 40 to 60 feet, not 65 to 85 feet as alleged. Holes were drilled through backfill material until the underlying bedrock was reached. An additional 30 feet was then drilled into bedrock. The upper portion of the hole (in backfill) was usually cased. The lower portion of the hole (in bedrock) was uncased.
131. There was no ground water from "an underground steam bed" encountered at the time of initial drilling of the caisson holes. The situation described by Mr. Hedrick occurred when rain water and ground water entered the holes. After pumping the rain water out of the holes, it was observed that water continued to percolate into several holes. At this time, PGandE's Engineering Department was contacted by a PGandE inspector to determine if this water presented a design concern. The PGandE Engineering Department engaged a soil consultant, Harding-Lawson Associates, to inspect all caisson holes for acceptability. At the conclusion of Harding-Lawson's field inspection and prior to concrete placement, the option was given to either place tremie concrete (underwater concrete placement method) or pump out the ground water

before concrete placement. The latter method was used. Water and/or muddy water was removed by mechanical means and dip buckets. The allegation is correct in inferring that Cal-OSHA requirements prohibited lowering of a man below the cased portion of the hole. Prior to the placement of concrete, each caisson hole was inspected visually and by sounding. These inspections found the holes to be acceptable and were documented on "Concrete Placement Cards" (as required by GFACo QC procedures). Each applicable inspection item, as noted on the Concrete Placement Card, was initialled by GFACo production and QA/QC personnel and a PGandE concrete placement inspector.

132. The two-week delay referred to as a "Mexican Standoff" in the allegation constituted the time required for Harding-Lawson to inspect the holes and develop their recommendations as well as time lost due to rainy weather.

133. No corrective action is required.

#### NRC Allegation #390

It is alleged that:

42. Due to its earth base of sandstone instead of granite as presumed, grouted cables designed to anchor turbine pedestals ended up pulling out. The tension cables are supposed to anchor the pedestals to bedrock, but sandstone was not a solid enough base to grip. (Hedrick Aff. at 12.)

134. Contrary to this allegation, the turbine building rests on sandstone bedrock as originally designed (Ref. FSAR Section 2.5). The turbine pedestal anchors were designed for installation in the sandstone bedrock. Prior to use of these VSL rock anchors, their suitability for use at Diablo Canyon was verified by installing and tensioning a test anchor. Conclusive evidence of the acceptability of each anchor has been achieved, as the design of these anchors requires that each anchor be tensioned to a load exceeding the calculated design load. Records documenting that every anchor was successfully preloaded to the required values are on file.
135. There were two anchors on which the cable strands broke under tensioning. They were removed and replaced with new anchors. One other anchor would not hold the specified 600 kips. These anchor deficiencies were documented on nonconformance reports which were reviewed and approved by the responsible PGandE engineer.
136. Records are available which verify that tensioning of all anchors met engineering design requirements. No corrective action is required.

NRC Allegation #391

It is alleged that:

43. Another threat to quality was the demoralizing effect from management's lack of commitment to quality on those of us with pride in our work. I tried to stay cheerful and earned the nickname "Solzhenitzyn" from my supervisors, as

the bearded dissident who wrote so much. I earned the management's respect also. On my last day on the job QA manager Mike Anderson told me that I was the best inspector they had. But I wasn't allowed to do my job. Overall it hurt to work at Diablo Canyon, because I care about my work and I was not permitted to do it to my satisfaction. In that environment an unknown number of deficiencies do not get reported, because inspectors get tired of the bumps from beating their head against the system. (Hedrick Aff. at 12.)

137. Contrary to this allegation GFACo management--corporate, division, and project--was, and still is, committed to achieving required quality levels for nuclear plant construction. The allegation that there is a lack of commitment has no merit.
138. The Quality Assurance Program used by GFACo was dated October 31, 1974 and had been used by GFACo on previous contract work under PGandE Specification 8831. The Program defined the policies and procedures to be "used to insure that the (quality) requirements of the Project Specification are met." All eighteen criteria of 10 CFR 50, Appendix B, were addressed in Quality Assurance Procedures, and the program was approved by PGandE on February 1, 1978, for use on Specification 5422, "Specification for Exterior Concrete Tank Protection and Modification to the Turbine Building at Diablo Canyon Power Plant Units 1 and 2."
139. Quality Control procedures were written specifically for Specification 5422. As the work progressed, revisions were made to the QC procedures clarifying or improving inspection requirements when appropriate. New QC procedures were written by GFACo and approved by PGandE prior to the

start of new phases of work. Welding procedures were prepared for both structural steel and reinforcing steel using AWS code requirements.

140. GFACo management at corporate headquarters in South San Francisco was fully aware of the importance of the contract. Mr. A. F. Demattei, as Division Vice President, was responsible for the GFACo contract work and periodically visited the site. He had spent six years at Diablo Canyon working first as Project Engineer and then as Project Manager for GFACo on Specification 8831. At the start of the work under Specification 5422, Mr. Demattei emphasized the goal of quality in a memorandum dated January 9, 1978, to R. W. Wunderlich, GFACo Project Manager. The memorandum established an offsite reporting relationship for Quality Assurance "to insure that construction activities are conducted at the specified level of quality and are not overruled by schedule."
141. In response to the requirements of 10 CFR 21, a memorandum dated October 27, 1978, was issued to "All GFACo Quality Assurance Personnel" with an attached "Notice to All Employees" setting forth a statement on reporting of failures and defects. GFACo Quality Control Procedure QCP-9 addressed the reporting of nonconforming items to PGandE and the Nuclear Regulatory Commission.
142. All Quality Assurance personnel received indoctrination relating specifically to GFACo project work. Personnel assigned to inspection duties were given additional reading assignments and, after a suitable

training period, were given an examination as a basis for certification as an inspector. Quality Control Procedure QCP-13, "Personnel Training," described the requirements for qualification of personnel who inspect the quality of the work.

143. The GFACo program included formal audits of documentation and work-in-progress. A division audit dated April 19, 1978, confirmed that the work was controlled in accordance with approved Quality Control procedures. The same audit also made recommendations concerning new or revised procedures and additional Quality Assurance personnel. Both recommendations were accepted and implemented by GFACo. Mr. T. G. Loomis was assigned as Quality Assurance Engineer and Auditor at the Project.

144. Mr. Hedrick was employed as a structural steel QC inspector from February 27, 1978, to August 24, 1979. Mr. Hedrick was assigned as a QC inspector on the swing shift. This swing shift (which started on May 30, 1978, for structural steel) was abolished on March 9, 1979, because GFACo-assigned work was at a stage that required only one shift to complete the remaining assigned work. All GFACo work under this contract was completed on August 21, 1979, and GFACo moved off the site on August 29, 1979. GFACo management never instructed their QC inspectors to sacrifice quality for production. Management always stressed the same quality workmanship and standards on both shifts. Further, QC inspectors on both shifts were qualified through



training/certification to perform the type of inspections they were assigned to inspect.

145. After the swing shift was terminated, Mr. Hedrick was assigned to audits of documentation in order to verify records. It is not an uncommon practice to have QC inspectors perform audits of documentation as they are normally more qualified to perform this function, and it permitted Mr. Hedrick to be employed throughout the GAFCo contract. Any discrepancies identified during Mr. Hedrick's audits and inspections were resolved as required by the Quality Assurance Program. Quality Assurance documentation was maintained in file cabinets located in an inside room at the GFACo project office building. The file room, referred to as the "vault," was occupied by the Quality Assurance engineer responsible for document control. Mr. Hedrick was sent back to the field to perform QC inspections because of the need for additional inspectors in the production area.

146. While Mr. Hedrick, in his QC role, identified many deficiencies during his various assignments, to PGandE's knowledge they were all resolved satisfactorily through the Quality Assurance Program. This is confirmed by Mr. Hedrick's review of his personal diary. As part of a practice beyond the requirements of 10 CFR 50, Appendix B, PGandE requested that all personal diaries that might contain an unresolved quality assurance matter be reviewed. GFACo memorandum to PGandE dated March 22, 1978 (Attachment 2) confirmed the method by which diaries, that may contain

quality assurance matters, were reviewed periodically to ensure that appropriate action was taken on any unresolved item. Mr. Hedrick performed such an audit on his own diary on June 5, 1979, (Attachment 3) and the audit form indicated that there were no unresolved Quality Assurance-related problems for the period from September 1, 1978 to June 1, 1978." (sic). As shown on sheet 2 of Attachment 3, the actual review period was September 1, 1978 to June 1, 1979.

NRC Concern #396

It is alleged that:

27. The welders that came out of the qualification process had to do the work three to four times before it was acceptable in some instances. This created an unknown degree of extra stress on the structural steel. (See July 19, 1978 memorandum to Mike Anderson, enclosed as Exhibit 7). (Hedrick Aff. at 9.)
147. Welders hired by GFACo were dispatched from the union hiring hall in Fresno. In accordance with AWS D1.1, Rev. 2-77, welder qualification tests were conducted either in Fresno by a PGandE-approved testing laboratory (Twining Laboratories) or at Diablo Canyon. Those welders who passed the qualification test were assigned to GFACo production crews. Each foreman determined the ability of each individual welder to perform quality work in various configurations and positions. Abilities varied for each welder, and reassignments were made until satisfactory production crews could be established. During the initial work assignment of many new welders, weld repairs and rejects did occur.

However, weld acceptance criteria were the same for all welders, and no welds were accepted unless they met the criteria contained in the applicable Quality Control procedure. Mr. Hedrick has, in fact, verified that the QA program was effectively controlling welding programs such that only acceptable welds were allowed, even if multiple repairs were required to achieve the requisite quality.

148. Mr. Hedrick provides no specific examples of the instances where weld rerepairs may lead to "extra stress" and, therefore, a specific response is not possible. Obviously, weld repairs and potentially induced stresses are well known in the welding industry. The welding and design codes include requirements for weld repair, but do not provide strength reductions or require revised stress calculations in these circumstances.

149. No further corrective action is necessary.

#### NRC Allegation #397

It is alleged that:

28. It was almost impossible to get unqualified welders off the job. On paper I had the authority to send them back for additional training and retesting. But production would ignore my instructions and just reassign the welders to another crew. This happened on around half a dozen occasions over the 18 months that I worked for Atkinson. When Atkinson's contract ended, the same welders got on at Pullman and Foley, suggesting that those contractors' standards are as low as Atkinson's. (Hedrick Aff. at 9.)

150. PGandE has no information supporting Mr. Hedrick's allegation. To the contrary, Mr. Carlson, who was PGandE's swing shift inspector, affirmed that Mr. Hedrick never complained that a questioned welder had continued as a production welder. Mr. Hedrick had the right to question any welder's ability and to require another qualification test if the welder was to continue as a welder as described in GFACo Quality Control Procedure W-1, "Welding and Welder Qualification" (AWS D1.1, Rev. 2-77). Generally, a welder was reassigned to a nonwelding crew as an alternative to requalifying or terminating the welder.
151. Some welders later went to work for Pullman or H.P. Foley. These welders were requalified in accordance with approved contractor's welding procedures prior to performing welding.
152. No further corrective action is required.

NRC Allegation #399

It is alleged that:

30. When inspectors found evidence of ghost welding, management did not satisfactorily address the problem and it persisted. Although there are neames (sic) credited to the welds, I wouldn't vouch for their accuracy generally. (Hedrick Aff. at 9.)

153. "Ghost welding" did not occur or persist as alleged. Occasionally, an undocumented weld was identified by an inspector. In such cases, the weld was documented on an NCR.
154. All GFACo welders were qualified prior to being assigned as welders and all welds were inspected prior to acceptance. Inspection of welded joints required a combination of welder and inspector communication; i.e., the welder must advise the inspector when a "Documented Inspection Point" had been reached and the inspector must be aware and available to make the inspection. Since there was not a one-to-one relationship of welders and inspectors, a weld was undocumented only when production failed to notify Quality Control for required inspection. The GFACo inspection document identified each weld joint and was used to verify that inspection had taken place and that the weld was acceptable. In cases where documentation did not include a welder's name and the welder could not be identified, an NCR was written (e.g., NCRs 315 and 321 listed missing welders' names at four weld locations). It should be noted that AWS D1.1 does not require welders to be identified in relation to specific welds. The GFACo QA program went beyond the code requirements and identified the welder by name as further verification that the welder was qualified. While such instances occurred, they were not frequent and the corrective actions, which included reinspection, removal of the weld, or accept-as-is, were controlled by the QA program.
155. No further corrective action is required.

NRC Allegation #400

It is alleged that:

31. I observed tack welding using flux core, a process used for heavy filling passes. Tack welding is just to hold something sensitively in position. They should be as small as possible, since they get consumed in the new weld. There is no provision in the specifications or procedures allowing that process to be used for tack welds. (Hedrick Aff. at 10.)

156. Contrary to the allegation, tack welding by the flux core method is not prohibited either by AWS D1.1 welding code or by PGandE specifications. Use of the flux core process is an acceptable method of tack welding when the tack weld is incorporated into the final weld using electrodes which meet the requirements of the final weld and is performed by a welder qualified in the process to be used.
157. No further corrective action is required.

NRC Allegation #401

It is alleged that:

32. Informal or undocumented weld repairs created more damage than existed initially in some cases, such as when crews ground from 1/32" to 3/32" down into the base metal. In a February 15, 1979 swing memorandum, enclosed as Exhibit 9, I warned, "This is a problem we must deal with fast as much damage is being done". I did not receive a response, and the process of grinding these welds flush continued. As a result after grinding flush it was not possible to usually determine that a weld was out of specification. (Hedrick Aff. at 10.)

158. Grinding into the base metal, while not desirable, occasionally occurred. Contrary to the allegation, established guidelines were documented and approved by PGandE.
159. If any grinding caused the weld to be unacceptable or of indeterminate quality, additional steps were taken by the responsible QC inspector prior to final acceptance.
160. In areas where excessive grinding did occur, the base metal was repaired using an approved base metal repair procedure as contained in GFACo Welding Procedure Specification WPS-1.
161. No further corrective action is required.

NRC Allegations #403, #422, #423 and #424

It is alleged that:

12. I was instructed to report QA violations through memoranda, and not to use the formal nonconformance reporting system. My supervisor would decide if the memorandum should be written up. This kept the NRC from seeing the issues I raised. Everything was a private affair between the boss and myself.

9. The last day of my employment with Atkinson I observed and reported welds that failed my inspection at about a 60% rate, due to deficiencies such as grossly undersized legs, gross undercuts and rollover notches on the horizontal edges of the welds. There was so much slag in the undercuts that I had to clean the welds just to see what was there. The worst problem was that these welds had already been QA-accepted. I looked at 100-150 welds up

half of one side of the fuel handling building, which means that 60-90 bad welds previously had been accepted by my supervisor.

10. I did not report the 60-90 bad welds in the fuel handling building on a formal nonconformance form. Instead on QA manager Mike Anderson's direct orders, I submitted the results to him on one sheet, with no copies.

11. The reason for the informal quality report on the fuel handling building welds is that Mr. Anderson already had signed off to accept the welds which I just inspected. He had accepted the welds without looking closely at them a few weeks before the end of Atkinson's contract. He explained to me that he had walked the line but hadn't bent down. (Hedrick Aff. at 5.)

162. GFACo used a nonconformance reporting system which was established in GFACo Quality Assurance Procedure QA-15 and Quality Control Procedure QCP-9. Possible problems or nonconformances identified by QC inspectors were brought to the attention of QC supervision either through verbal contact or through written notes, sketches, and memoranda. QC supervision reviewed each item in relation to the PGandE specification, code, and QC procedures. When appropriate, GFACo Project Engineering would be consulted and design questions would be presented to PGandE for guidance, interpretations, and answers. At any point in this review by QC supervision a formal NCR could be initiated after verification that an item was, in fact, deficient or nonconforming.

163. The use of memoranda was especially important as a basis for communication by swing shift personnel to day shift QC supervision. Review by QC supervision ensured that consistent answers or interpretations for all potential deficiencies, including determination of actual NCRs, were always provided.



164. In addition, Mr. Hedrick had alternative routes to present any quality concern that he believed was not adequately addressed. He could, and in fact did, communicate directly with the swing shift PGandE inspector. He could, but never did, communicate directly with the GFACo offsite QA representative or with PGandE QA representatives, and he could, but to PGandE's knowledge did not, communicate directly to the NRC any such quality concerns during the time of his employment with GFACo.
165. The incident referred to in Allegations 422, 423, and 424 relating to fuel handling building welds took place at the conclusion of the GFACo contract. Pat Palomo, PGandE field engineer, identified unacceptable welds in the fuel handling building and communicated this problem to GFACo. Mr. Hedrick was directed by the GFACo QA Manager, Mr. Anderson, to inspect the welds and make a list of any that were unacceptable as the basis for an NCR.
166. The unacceptable welds were identified by Mr. Hedrick and were documented on GFACo NCR 331, which was initiated on August 28, 1979 (Mr. Hedrick's last day on the project was August 24, 1979). This NCR specified that H. P. Foley Co. was to perform and document all weld repairs after GFACo had left the site. GFACo work in the fuel handling building which was incomplete (including NCR 331) was listed in the turnover of documentation to PGandE which in turn assigned the work to H. P. Foley Co. GFACo NCR 331 was superseded by Foley Inspection Report 54-22-1. Reinspection and rework/repair were completed by Foley on October 9, 1979.

167. No further corrective action is required.

NRC Allegation #404

It is alleged that:

13. Management prevented me from inspecting in the more sensitive areas of the plant. My inspections were too thorough, and I consistently was able to back up my findings. To illustrate the restrictions, my boss explicitly (sic) told me they would never let me in the containment because it would disrupt the schedule. The restrictions violated my legally-required organizational freedom and also illegally sacrificed quality to scheduling concerns. Most significantly, the policy suggests that the same deficiencies I was finding in the turbine building also existed in other parts of the plant with even greater safety significance. (Hedrick Aff. at 5-6.)

168. Contrary to his belief, Mr. Hedrick as a QC inspector had no "legally-required organizational freedom" to inspect in any areas of the plant other than where he was assigned. The GFACo QA program does allow QA auditors the required organizational freedom to inspect any GFACo quality work in any area of the plant. Mr. Hedrick was hired as a QC Inspector, and he was assigned to inspect specific areas of work for which he had been qualified, namely, as a welding inspector in the turbine building and the fuel handling building. As to the allegation that a QC inspector has the freedom to roam the entire jobsite at will, it can easily be seen that such a policy would be chaotic and, at the least, provide severe constraints to the efficient performance of normal activities.

169. It should be pointed out that there are other individuals, including GFACo QA personnel, PGandE QA personnel, and NRC representatives who have the organizational freedom and responsibility to inspect any conditions which they feel require investigation. It also should be noted that during Mr. Hedrick's employment period GFACo work in the containment structure was minimal, and GFACo QC inspectors other than Mr. Hedrick were assigned to inspect work in the containment structure area.
170. The criteria for Mr. Hedrick's inspection responsibilities were set forth in Quality Control Procedures. These procedures established the acceptability standards for GFACo work and were used by all inspectors. Mr. Hedrick's inspections used the same uniform set of procedures and criteria as did the other inspectors which resulted in consistently "thorough" inspections.
171. No further corrective action is necessary.

NRC Allegation #408, #409, and #410

It is alleged that:

17. I informed management of the missing hold tag referenced in a memorandum the next day. My memo was ignored.

18. Although I was the head welding inspector on the night shift, management denied me the authority to issue hold tags directly a few weeks after my memo on the missing hold tag. I had to leave a request for the day shift supervisor

to issue the tags. I was the only inspector who could not issue hold tags which is an inspector's basic enforcement tool for immediate relief. Work may have continued and problems been exacerbated before the day shift supervisor got to my requests, even when he didn't veto them.

19. Removal of hold tags coincided with attempts to cover up the flaws that had been cited. One case involved one inch weld rod weave, when the maximum was 5/8". After my hold tag was removed the weld was covered over by performing more weld passes, called stringers. But even then, the coverup was unsuccessful. The original weld diameters were still visible in gaps between groups of stringer welds. (See Exhibit 3, at p. 1.) (Hedrick Aff. at 7.)

172. There is no basis for the allegations relating to misuse or restricted use of Hold/Reject tags. GFACo used a combination of "Hold" tags and "Reject" tags to control questionable or rejectable work. GFACo Quality Control Procedure QCP-9 "Nonconforming Items" addressed the issuance of "Hold" tags and "Reject" tags. A yellow "Hold" tag was used to identify an item which was in question. No record needed to be or was kept of "Hold" tags issued unless a nonconformance report resulted. A yellow "Hold" tag was also used to identify a verified nonconforming item for which an NCR would be prepared. Each such tag issued was sequentially numbered and listed in a log of "NCR Hold Tags Issued." The two logs referenced (NCR Hold Tags Issued and Reject Tags Issued) were set up as a basis for tracking or determining the status of work until tags were removed or final action had been taken. No formal signature or initialing of these logs was required by QA/QC personnel in order to enter a tag description. Periodically, the logs were updated and retyped by the QA secretary. These logs were not retained as quality records since they did not constitute "objective evidence" as required by the QA program.

173. A "Reject" tag could be issued by a GFACo Quality Assurance Inspector without preparing an NCR. Each such tag issued was sequentially numbered and described in a log of "Reject Tags Issued."
174. Quality Assurance Procedure QA-14 states that missing tags would be reported to the Quality Assurance Manager and be replaced by a Quality Assurance Engineer after verification of substantiating documentation. During the initial period of work by GFACo, there were instances of missing Hold tags or of production crews ignoring Hold tags. In August of 1978, the GFACo Project Manager held a meeting with the QA Manager, the General Superintendent, the Ironworker Superintendent and Foremen to discuss the importance of tagging to control the quality of work. Termination of personnel was indicated as the only option for resolving future infractions of the tagging system. This management action was successful since only isolated problems with Hold tags occurred thereafter.
175. Work-in-progress for which repairs were to be made did not require the issuance of a "Hold" tag or a "Reject" tag to correct unacceptable work if there was an approved method or procedure for making the repairs.
176. Allegation #408 is not substantiated. Mr. Hedrick's assertion that his "memo was ignored," relating to a missing Hold tag, is in conflict with QA Procedure QA-14 cited above, which describes the procedure for verifying and replacing a missing Hold tag. In fact, the whole episode

appears to stem from a series of misunderstandings by Mr. Hedrick. First, from the description of the nonconforming item in paragraph 16 and in Exhibit 6 of Mr. Hedrick's affidavit, the QC supervisor on the day shift likely determined that a Hold tag was not required since the work was in progress and approved methods and procedures for repairing the base metal existed. Secondly, as can be seen in Exhibit 6, apparently Mr. Hedrick's Hold tag was incorrectly entered in the "Reject Tags Issued" log and subsequent correction of the log deleted this incorrect entry. Since the "Hold Tag Issued" log is not available, it cannot be determined whether Mr. Hedrick's Hold tag was subsequently entered in that log or whether the day shift QC supervisor determined that it was not required for the reason described above.

177. Loss of any Hold or Reject tag in the field caused, at worst, a loss of time on the part of an inspector who had to expend the effort to replace the tag. Although a lost tag was an inconvenience, there was no degradation of quality of the final product. The ultimate acceptability of any weld was indicated on an inspection form which would be signed by the QC inspector only if all deficiencies in the work had been corrected.
178. In Allegation #409 (refer also to Allegations #415 and #416), Mr. Hedrick was told to issue Hold or Reject tags only on work that was directly assigned to him. The allegation is misleading since it implies that this instruction, not to issue Hold tags, applied to swing shift work for which he was the responsible QC inspector. This was not the case. He was instructed not to issue Hold tags on day shift work in progress.

179. The origins of this concern were instructions given to Mr. Hedrick by a PGandE swing shift inspector, Mr. Art Carlson, to place Hold tags on work in progress by the day shift. These instructions were reversed when it became apparent that the swing shift, both GFACo and PGandE, should only inspect and place Hold tags on swing shift work and not on work properly under the cognizance of the day shift. It is clear that Mr. Hedrick was allowed to issue Hold tags on swing shift work as is demonstrated by Exhibit 1 to his Affidavit. His December 27, 1978, swing shift memo (Exhibit 1) was dated over four months after the alleged instructions not to issue Hold tags. Item 2 on this memo clearly demonstrates that Mr. Hedrick could and did issue Hold tags and could and did stop work until the Hold tag was resolved.
180. Further (refer to Allegation #403), Mr. Hedrick was told to coordinate possible swing shift problems with the day shift QC supervisor to provide consistency of specification and code interpretation. All GFACo swing shift QC inspectors were required to coordinate the issuance of Hold tags with the day shift QC supervisor. Mr. Hedrick was not an exception.
181. Allegation #410 is without technical merit. Excessive weave was identified generically as a nonconformance. Resolution of this nonconformance was dispositioned by NCR 268 through qualification of 1-1/2 inch weave welds. It is likely that Mr. Hedrick's Hold tag and recommendation for repair to the weld were not approved by the QC

supervisor since the concern was being addressed in an NCR. NCR 268 identifies Mr. Hedrick as the individual detecting the nonconformance and states that none of the work has been accepted by QA pending the NCR disposition. Therefore, this situation demonstrates that Mr. Hedrick's concern was addressed appropriately in the QA program and that the quality of the weld was acceptable.

182. No further corrective action is required.

#### NRC Allegation #414

It is alleged that:

1. I severely doubt that Pullman complied with design specification (ESD) or welding procedures (WPS) during the early years of construction, because when I audited their status and distributed the current versions in 1974 I learned that over 200 different versions of the design specifications and weld procedures were being used simultaneously. Revisions packets up to one half inch thick were coming out every two weeks. There were half a dozen revisions per year on some sections. But the foremen had been very lax in reading and inserting the revisions. In some cases, as I updated the files, I saw that foremen were missing several dozen revisions for particular specs. (Hedrick Aff. at 2.)

183. Contrary to the allegation, the Pullman Power Products procedures, Engineering Specifications Diablo (ESD), are not, nor were they ever intended to be, design specifications. In addition, the auditing and correcting of controlled distribution of ESDs and weld procedures is a normal and ongoing function of the Pullman QA organization. We have



reviewed all Discrepancy Reports during the 1974 time period and have failed to find any discrepancies that specify a generic problem regarding control of ESOs and WPSs.

NRC Allegation #415

It is alleged that:

2. My boss told me not to look right or left during my inspections. I was specifically informed that I was only to look at the individual weld assigned. (Hedrick Aff. at 2.)

184. Contrary to the implication of the allegation, there were never directions from GFACo management to inspectors either to ignore or pass over any nonconforming work. The scope of GFACo work at Diablo Canyon was defined by Specification 5422. GFACo performed this work in accordance with a PGandE approved Quality Assurance Program and Quality Control Procedures. After training and examination, GFACo Quality Control Inspectors were assigned specific inspection responsibilities in designated work areas. A QC inspector does not have the authority or responsibility to roam the site, at will, looking at anything he chooses from any contractor. Further, Mr. Hedrick was told not to reinspect work which had already been inspected by GFACo day shift QC inspectors.

However, the GFACo QC inspectors were advised that should they observe a questionable or nonconforming item resulting from work of other contractors during the performance of their assigned work, they should notify PGandE for disposition and/or corrective action as required.

185. No corrective action is required.

NRC Allegation #416

It is alleged that:

3. There were drastically inconsistent inspection standards between Quality Assurance (QA) inspectors on the day and night shifts. The night shift routinely rejected work that would have been accepted by the day shift. The difference in our standards was that the night shift was not accepting work unless it met specifications. The day shift accepted work that was obviously unacceptable. In one example, the night crew did not know the work had already been bought off by the day inspectors. The acceptance had not yet appeared in the books. The production department spent four hours completing the assignment, because it obviously was not a finished work product. There was too much reinforcement piled on the weld in question. (See December 27, 1978 swing memorandum, enclosed as Exhibit 1.). (Hedrick Aff. at 2-3.)

186. Contrary to the allegation, all inspections on all shifts were conducted by GFACo QC personnel in accordance with the same procedures, criteria, codes, and standards. The specifications were obviously the same for all shifts. However, it is recognized that there is always a possibility of different interpretations of procedures, codes, and standards when a personal judgment situation exists, such as during the course of a visual inspection.

187. The statement that the "night shift routinely rejected work that would have been accepted by the day shift" is grossly misleading. The day shift had direct and immediate access to Project Engineering and others with specific knowledge of specification and design requirements. Thus, they could obtain resolution or explanation of many conditions encountered and sign off on the work with minimal delay. The night and swing shifts did not have this immediate support and had to stop work until interpretation could be obtained during the following day shift. Therefore, the number of stop work or reject tags issued by a shift's personnel is not an accurate measure of the caliber of inspection or the stringency of the shift's standards.
188. Communications between craft and inspection personnel on successive shifts depended on a combination of direct, verbal interface through shift overlap and indirect contact through use of written notes and log books as the basis for defining the status of work, i.e., what had been completed, what remained to be done, what repairs were to be made, and what problems existed. Occasionally, this communications process may not have functioned perfectly and inspection work was repeated. However, such repetition is not necessarily a negative action with respect to quality. The final review of documentation packages by a GFACo Quality Assurance engineer verified that inspection documentation was complete for all weld joints.

189. Mr. Hedrick's concern over excess weld reinforcement was immediately forwarded to PGandE (telephone memo dated January 24, 1979) and, after review by the PGandE responsible engineer, the over-reinforcement of the welds in question was found to be acceptable and to satisfy the design requirements. Up to a maximum of 1/4-inch, excess reinforcement was allowed when GFACo was using wire feed welding methods. Excess reinforcement allowable limits were later reduced to 1/8-inch (PGandE telephone memo dated February 8, 1979) when GFACo returned to the use of stick electrodes, which were much easier to control. Excess reinforcement was ground off, as necessary, in preparation for ultrasonic testing by GFACo QC inspectors.

190. No corrective action is required as a result of this allegation.

#### NRC Allegation #417

It is alleged that:

4. Management built informal tolerances into the theoretically minimum design specifications, as another tactic to accept work that fell below the minimum requirements. For instance, management used this technique to instruct us to accept undersized bevel welds on the flange extension bars. The design called for at least 5/8 inch double bevel welds and one inch single bevel welds. But almost every bar had undersized bevels. There were 1/2 inch bevels, and 7/8 inch single bevels. They were all acceptable, under the management's "tolerance" system. This is another example where the day and night shifts applied different inspection standards. A February 12, 1979 swing memorandum describing the undersized welds is enclosed as Exhibit 2A. A table issued by management to describe the tolerances is enclosed as Exhibit 2B. (Hedrick Aff. at 3.)

191. Contrary to the allegation of informal tolerances by management, the minimum requirements of the AWS Code were met in the sheet of tolerances referenced as Exhibit 2B. GFACo QC inspectors requested criteria for inspection of weld bevels. GFACo prepared a sheet of tolerances (based on AWS D1.1. Rev. 2-77 requirements) which gave the minimum throat size to be measured for specified depths of chamfer of nominal 5/8-inch and 1-inch partial penetration welds using allowable code tolerances. PGandE reviewed the allowable tolerances and, by Design Change Notice DCN-GC-922 dated February 14, 1979, established design requirements in excess of the AWS Code; i.e., a 1/2-inch minimum effective throat was established for a 5/8-inch single bevel weld and a 7/8-inch minimum effective throat for a 1-inch single bevel weld. While allowed by the AWS Code, PGandE eliminated the use of any "minus" tolerance for the weld bevels.
192. The referenced chart was in use for no more than two days before it was superseded by PGandE's Design Change Notice. This allegation has no merit as it was addressed immediately by GFACo and answered by PGandE. No further corrective action is required.

NRC Allegation #418

It is alleged that:

5. The quality of early Atkinson inspectors was erratic: necessary information was not verified because there wasn't a perfected, systematic weld record system. The system initially was established by trial and error from the bottom up. Later, the system was perfected. But some of

the early inspection records were so superficial that multiple operations or welds were covered by a single check mark. (See February 2, 1979 swing memorandum enclosed as Exhibit 3, at p. 2). (Hedrick Aff. at 3.)

193. The GFACo inspection requirements, as established by the PGandE specification and the codes referenced therein, were consistent throughout the contract. At the start of contract work in 1978, GFACo was given approval to use a Quality Assurance Program which had been previously used onsite for work under Specification 8831 (1969-1977). This program met all of the Diablo Canyon requirements in effect as of that date. The QA program was strengthened through issuance of successively more detailed and explicit Quality Control procedures. As modification work started on the first few bays of the turbine building, it became necessary to develop a more detailed inspection/documentation system so as to provide better traceability of documentation for each unique joint or plate. This change meant redocumenting the initial inspection records. After multiple forms identifying the previously completed and inspected joints had been prepared from the original single form by QC lead inspectors or by a QA engineer, the original QC inspector was contacted for confirmation and initialing/signing of the inspection form for each numbered joint for which the inspector was responsible. Incomplete or missing information was either documented through an NCR or the work was reinspected. There was no falsification of documents. No further corrective action is required.

NRC Allegation #420

It is alleged that:

7. Management instructed us to emphasize certain sections of the specifications and to ignore others. For example, we were told not to write up violations of the specifications against excessive weave for welds. The specs say the rod cannot be moved more than twice its diameter; but I saw instances of weave that is 1 1/4 (sic) inches wide. This was around five times too much weave. Excessive manipulation of the rod buries slag into the weld and decreases the density of the weld. QA management criticized the night shift for issuing hold tags on these violations and told us to stop the practice. Similarly the specifications have limits on how oversized a weld can be. In some cases welds were grossly over the specified size. But production and QA management heavily resisted and personally raked me over the coals when we wrote up violations of weld size limitations. (Hedrick Aff. at 4.)

194. There were no sections of the specification which Quality Control inspectors were told to ignore. However, there were certain aspects of the specifications or procedures where discrepancies in the field work had been identified which were disposed of generically. In these cases, QC inspectors may have been instructed to avoid reidentification of discrepancies which have been identified generically by NCRs or PGandE design clarifications.
195. Excessive weave for welds was one such case. This discrepancy had been properly identified by Mr. Hedrick and a PGandE inspector (Ref. telecon dated February 23, 1979, and GFACo NCR 268). The NCR was processed in accordance with applicable procedures by PGandE to accept all welds with weave up to 1-1/2 inches after qualification tests were successfully made, as is permitted by AWS Code D1.1. QA approval of such welds was placed on hold until the NCR resolution was completed.

196. Contrary to the allegation, wide weave does not trap slag any more than narrow stringer welds. Welding procedures were written and acceptably qualified by GFACo using weave up to 1-1/2 inches.
197. During the time period in which this weave concern was under investigation (February 23 to March 16, 1979), swing shift QC inspectors continued to emphasize excessive weave and issue Hold tags for violations. GFACo QC supervision considered that one Hold tag, referencing NCR 268, was adequate to cover the generic problem of weave, until formal PGandE approval was received on the revised welding procedures.
198. In the other case cited by Mr. Hedrick, that of oversized welds, PGandE Engineering approved an increase in maximum reinforcement to 1/4 inch. GFACo QC supervision considered this generic resolution to eliminate the need for the swing shift QC inspectors to continue to issue Hold tags for welds with reinforcement greater than 1/8 inch.
199. The items of concern were resolved and no corrective action is required.

NRC Allegation #421

It is alleged that:

8. I saw that a large number of welds on the underside of the floor at the 119 foot level had been accepted, although the work did not meet the requirements on the drawings. I was sent to inspect one group of welds because crews were



shorthanded and the scaffolds couldn't be removed until the work was bought(sic). These welds were at different stitch lengths and spacing than specified on the drawings. The workmanship was so poor that in the trade they would be called "dog meat". They were consistently in violation of the requirements but had been consistently accepted. I compared these welds with the other welds in the same area I had been assigned and that were similarly bad. I started looking around to see if there were any acceptable welds. I ended up tagging the whole area. (Hedrick Aff. at 4.)

200. The welds in question were located in the G column area at the 119-foot level of the turbine building. The fact that the welds had not been performed properly was first identified by Mr. Art Carlson, a PGandE inspector who, in accordance with the appropriate procedures, directed Mr. Hedrick to inspect and reject ("red tag") the welds. Mr. Carlson's discovery of the welds was noted by Mr. Hedrick in Exhibit 8 to his affidavit.
201. Subsequent investigation showed that the welds were still "in process" and, although certain hold points had been approved, the welds had not been accepted by GFACo QC. It is further possible that, as these welds were discovered at the start of the swing shift, the day shift QC personnel had not yet even inspected the condition of the welds. In any case, the statement that the welds "had been consistently accepted" is patently false. Further, the statement that "the whole area" contained only faulty welds is, at best, misleading. The total number of faulty welds involved in the incident described was less than 10. These welds were in process and were repaired in accordance with the proper procedures and subsequently accepted.

202. This incident is another example of the QA system working as it should. Both GFACo inspectors and PGandE field engineers were performing their inspection activities properly and took the appropriate actions when any deficient condition was discovered. The necessary rework was performed in an appropriate and timely manner.

203. This item requires no further corrective action.

In the following series of seven allegations, 426-434, the anonymous allegor has allowed his expertise in the area of quality control to expand into areas where he has only limited or no first-hand knowledge of and experience with the subject matter. One may ask why, if the offered salaries were as low as alleged, did this expert inspector accept employment? Or, if certain elements of on-the-job training were not acceptable, how did this individual manage to accumulate the experience that he now says he possesses? The allegations are a series of personal opinions which are not substantiated by the facts.

NRC Allegations #426 and #427

It is alleged that:

Frank Layante (sic), Pullman's Assistant QA/QC Manager at Diablo Canyon, was in charge of hiring. He made several trips to other areas, including Washington and Minnesota, in an effort to hire more inspectors. He interviewed more than 100 people with nuclear inspection experience, but

because of the low pay being offered only a few accepted employment. Consequently, Pullman was forced to hire people who had no experience as QC inspectors in order to provide the minimum number of inspectors required.

To make the situation worse, there was no formal training program for these people. They were given materials to read, summarily tested on that material, and then certified as inspectors. In working with these people. I can state that the majority have become adequate inspectors over time, but only after months of on-the-job training, and, I presume, after they had made numerous errors in their work. (3/21/84 Anon. Aff., Attachment 9, at 2-3.)

204. These allegations are based on hearsay, presumption, and unsubstantiated personal opinion. It is curious that this inspector can claim any knowledge of specific salaries offered by Pullman to prospective employees, or of the total experience level mix of all individuals on the job, because he was not directly involved with the hiring and/or management of Pullman QA/QC or engineering personnel. By his own statement, he is a QC inspector. It can also be noted that in an April 5, 1983, sworn statement by Mr. V. Tennyson and Mr. R. Roam, Quality Manager and Assistant Quality Manager of Foley, Mr. Roam states "Everyone wanted to switch and go to work for Pullman," because of the high level of Pullman's salaries, a direct contradiction to this allegation.

205. QA/QC personnel are hired based on previous experience and/or education and certified in accordance with Pullman's approved procedures. It can be expected that, unless specifically precluded, the experience level mix of personnel on any job will vary widely. The minimum acceptable level was originally prescribed in ESD 237 and is now prescribed in ESD

278. In 1982, Pullman upgraded and expanded its detailed, formal training program for new QA/QC employees. This program has been addressed in detail in PGandE response dated March 19, 1984, to Joint Intervenors' Motion to Reopen on CQA, Geske, et al. Aff. at 16-19. The program included required and optional readings, an extensive written examination, and on-the-job training.

206. On-the-job training is part of any individual's ongoing learning experience, whether the individual be inexperienced or experienced. Any individual coming to a new job will require a certain amount of time to familiarize himself with the requirements of the job and the specifications and procedures to which he is working. In fact, this type of training can often be considered superior to "book learning." The existence of "on-the-job training" also does not mean that appropriately selected and trained individuals, working to clearly established procedures and standards will, or did, make an unacceptable or unusual amount of errors. All that can and should be expected is that appropriately selected individuals will be hired and trained in an acceptable manner to do the necessary job and that their performance and work product will be reviewed and audited on a regular basis. This was, and is, the case with Pullman employees at Diablo Canyon. Thus, this allegation is unfounded and no action is required.

NRC Allegation #428

It is alleged that:

Because of the lack of experience or adequate training, I would have to judge the quality of Pullman's inspectors as marginal at best, with an obvious lack of experience, for the period of January 1983 to September 1983, during which time most of the Unit One work was completed. The situation has improved somewhat since then, but the work performed from January to September 1983 must be considered suspect. (3/21/84 Anon. Aff., Attachment 9, at 3.)

207. The facts do not bear out the opinion that work was "suspect" or that a "blind leading the blind" condition existed. The method of testing and training of Pullman personnel has been addressed in PGandE response dated March 19, 1984, to Joint Intervenors' Motion to Reopen on CQA, Geske, et al. Aff. at 16-19, and in responses to NRC Allegations #426, #427, and #478 contained herein.
208. As a result of this training, testing, and on-the-job experience, the Pullman Quality inspectors were able to competently perform their duties during the period of January 1983 through September 1983. No major deficiencies have been identified in the work performed and inspected during this period through numerous audits and reviews conducted by PGandE, NRC, and Pullman QA.
209. The allegor's continued concern about "on-the-job" training is repetitious and unsubstantiated. In general, most people who are involved in any job function gain experience, knowledge, and expertise as time passes. A QC inspector is no different. The fact that an

individual is improving his capabilities while on the job does not mean that he was not qualified to perform the function at the start of his assignment. Nor does it indicate that the actual work performed is necessarily of suspect quality. The personnel had sufficient experience and training to perform their job. Therefore, this allegation is unfounded and no action is required.

NRC Allegation #429

It is alleged that:

Ultimately, the final review of quick fixes and as-built drawings was made by Pullman's QA department. Here again, the majority of people who were hired were not experienced at that type of work. In spite of that, they did find numerous errors, which I think is partly because they were so prevalent and so easily discovered. The problems of rejected drawings were so severe that nearly a third of the already accepted work had faults that were found by QA. Unfortunately, this does not indicate to me that QA was doing its job adequately, though, because I have often reviewed QA rejects and found even more problems than QA had. (3/21/84 Anon. Aff., Attachment 9, at 4.)

210. Once again, the allegor presents his unsubstantiated opinions as if they were facts. He has taken a small portion of the quality program out of context in an attempt to substantiate his allegation. Although Pullman QA does a final review of quick fixes and as-builts, their review is limited to areas within their expertise. They check the documents for the quality and documentation aspects, not for design or construction appropriateness. Design is the responsibility of Project Engineering

and documentation of the acceptability of construction is the responsibility of the QC inspectors and Project Team General Construction (PTGC).

211. The fact that a deficiency is identified by the QA review does not necessarily mean that the final product is or will be unacceptable. In general, the QA review is an administrative one and not a technical one. Drawings may be rejected for lack of a signature or the absence of a note, but the QA group does not pass on the technical adequacy of an item. Final as-built drawings receive various levels of scrutiny from PGandE QC, PGandE QA, and a final technical review by PGandE Engineering.
212. The fact that the QA group had the capability, training, diligence and organizational freedom to uncover the "numerous errors" alleged indicates that the system is working. The facts demonstrate that Pullman's QA department was adequately staffed and trained and performed their duties in an acceptably professional manner. Thus, this allegation is unfounded and no action is required.

NRC Allegation #430

It is alleged that:

While the level of experience and training was extremely poor, at best, for QC, QA and field engineering, it was non-existent for craft personnel, including foremen and general foremen. Their attitude was then - and still is - that QC and engineering will direct them and instruct them

in regard to code requirements. Of course, after a period of time, most craft personnel eventually become familiar with the procedures they have been using. However, often they must do work that is governed by another procedure. (3/21/84 Anon. Aff., Attachment 9, at 4-5.)

213. The allegation that the training of craft personnel at Diablo Canyon was "non-existent" is unsubstantiated by the facts.
214. There is no requirement or need for a formal technical training program for craft personnel at Diablo Canyon. Individuals working at the plant are assumed to be sufficiently trained in their craft skills by virtue of their journeyman status. These skills are developed and tested by the craft unions prior to an individual achieving this status. The specific requirements of the job site are learned through their foremen, general foremen, and superintendents. Foremen and general foremen are picked for these duties based on their previous experience, knowledge, and familiarity with Pullman procedures. The foremen and general foremen are familiar with the procedures in place and the requirements of the job. Controlled copies of procedures and specifications are conveniently and appropriately available for reference, if needed.
215. To espouse the theory that the crafts rely on QC to tell them how work should be done may be attributable to the alleger's ego. At times, QC inspectors may be called upon to provide clarifying advice to craft workers encountering problems. But it is not the role of QC or Engineering to instruct craft workers as to how to do their job. All a craft worker must do is be skilled enough to follow the process sheets.



216. The construction of Diablo Canyon has been achieved by an appropriate mix of design, construction, and quality control personnel working to established procedures which clearly delineate the applicable procedural and code requirements. This process has, and continues to be, accomplished effectively at Diablo Canyon. Therefore, this allegation is unfounded and no action is required.

NRC Allegation #431

It is alleged that:

My greatest concern is with Pullman's fundamental approach of starting the work first, and then if problems occur, at best, only trying to rectify the system to prevent the same errors from occurring in the future, without going back to correct previous mistakes. As an example, I have noted non-compliances such as welding performed without using the required welding procedure. I wrote a discrepancy (sic) report identifying the problem, but the response from PG&E was simply to "accept as is," a response I've become all too accustomed to seeing. PG&E doesn't seem to care about meeting code requirements.

The S.T.P.R. "steps to prevent recurrence" block on the form was filled in with the typical "retrain Qc and craft in the requirements of E.S.D." S.T.P.R. retraining, however, is nothing more showing (sic) the procedure requirement to the involved personnel and having him sign a "training" sheet. No other training is ever given. This is not an effective training method. (3/21/84 Anon. Aff., Attachment 9, at 5-6.)

217. The fact that a discrepancy was identified by the allegor and then documented and dispositioned appropriately is evidence that the Quality Control program was operating effectively. The disposition to "accept as is" is done only after a thorough engineering evaluation of the

original design criteria, the implications of the deficiency, the potential dispositions and their feasibility. These evaluations are the responsibility of PGandE as Engineer and the justifications for these dispositions are adequately documented. The decision to "accept as is" is not made in a vacuum nor is it made hastily. The fact that the allegor does not agree with these decisions may be indicative of a lack of the necessary engineering expertise or breadth of project understanding to comprehend the reasons for the proposed disposition and its implications.

218. Steps to prevent recurrence are taken to prevent the identified issue from perpetuating. Part of the evaluation process is to also look at the generic implications of the "problem." If it is determined that the "problem" might have adversely impacted previous work, appropriate actions, including recalculations, reinspections, or retesting, may be taken, as necessary.
219. It is untrue to state that "no other training was ever given." Various training sessions were given to Pullman Engineering, QC, and QA personnel and are adequately documented. The allegor's concluding statements about PGandE not caring "about meeting code requirements" and that "the quality of much of the construction at Diablo is simply indeterminate" are not supported by the facts. Various audits and re-examinations by both internal and external organizations have evaluated and determined the adequacy of the existing work. Thus, this allegation is unfounded and no action is required.

NRC Allegation #434

It is alleged that:

The third area of concern that I wish to address is the failure of management to provide prompt and adequate answers to quality control questions raised by inspectors. The way things work in practice is that for those questions that are easily answerable, a response is quickly given. For those questions that are not easily resolved, however, an excessive amount of time, perhaps months, is taken before any response is given. And then, quite often, only a poor or less than satisfactory answer is provided.

When I have further pursued certain issues, I have been met with anger and hostility for my persistence. It seems that there are a number of sensitive issues that no one wants to address. When pushed for answers, management typically responds by saying not to concern yourself with that. Those inspectors who choose to pursue their questions - for example to the NRC - have found themselves in strong disfavor with Pullman management. There have been many instances of intimidation, threats of firing, denial of pay raises and, on at least two occasions that I am personally aware of, actual firings in retaliation for pressing safety issues or quality concerns. (3/21/84 Anon. Aff., Attachment 9, at 8.)

220. This allegation is unsubstantiated by the facts and, in reality, is only one more subjective opinion by the alleger. It is obvious that responses can be quickly given for problems that are easily answerable while more detailed problems take longer. If the issue is complex and/or has potential generic implications, its resolution may well take months. In addition, items having no immediate implications may be set aside to pursue more pressing matters. However, every effort is made by management to adequately address all such concerns, either verbally or in writing.

221. The allegor complains about alleged harassment and intimidation. The allegors, to date, are almost all people whose job it is or was to uncover inconsistencies, deficiencies, errors, etc. for purposes of correction. Obviously, these individuals can easily claim that they are being intimidated or harassed whenever anyone speaks to them in any fashion they do not like. It is easy for them to speculate that the person who spoke to them in a fashion they did not like did so because of some part of their work. It is apparently very easy to blame every missed opportunity for promotion or pay raise, a request to do an unpleasant task, a layoff, or even a deserved termination, on "retaliation" by management, as opposed to facing the discomforting thought of a personal deficiency. It is this mindset that best characterizes the allegor's concerns when viewed in light of all the relevant and material facts. When all is said and done, "management" of PGandE and its contractors has not engaged in a "systematic scheme of intimidation, harassment, and retaliation." PGandE and its contractors have not, as has been alleged, engaged in "suppressing quality concerns." Indeed, even the presented allegations bear this out when examined in the full light of competent evidence. This allegation has no basis in fact, and no action is required.

#### NRC Allegation #435

It is alleged that:

There has been a lot of information brought out about the quality assurance (QA) breakdown at the Pullman Power

Products Corporation, where I used to work as a quality-control (QC) inspector, but it goes well beyond Pullman. In particular, when I worked for the Guy F. Atkinson Company the same problems existed there. (3/21/84 Anon. Aff., Attachment 8, at 1.)

222. The anonymous affiant was apparently a coworker with Mr. Hedrick on the GFACo swing shift (Anon. Aff. at 3). As such, the responses to Mr. Hedrick's allegations apply to this allegation. The lack of specific information in the anonymous affidavit prevents investigation of the circumstances of the alleged instances in the affidavit of document falsification or signature forging. However, GFACo management neither sanctioned nor had knowledge of any of these instances.

#### NRC Allegation #440

It is alleged that:

Soon after that, I noticed a welder on a scaffold, doing welding that required pre-heating and the maintenance of the proper interpass temperature. But I could tell that he was doing neither of these, because there was no oxyacetylene hose running to his work station. So I climbed up the scaffold with a temperature "crayon" to check the temperature, and found that he was in violation of the minimum temperature requirements. (3/21/84 Anon. Aff., Attachment 8, at 3.)

223. A QC inspector's responsibility included monitoring of preheating and interpass temperature control to ensure that welders were within the ranges specified in welding procedures. The incident described in the Anon. Aff. paragraphs 9-11 (i.e., removal of welding that had not been done in accordance with approved procedures) indicated that the QC

inspector was performing his assigned duties and reconfirmed that QC was enforcing the specification requirements. (Refer also to the response to NRC Allegations #383 to #385 on preheating of welds.)..

224. As no specific details have been provided, only a generalized response is possible. If we assume the welder was correct and preheat was not required, then the QC inspector was overly conservative. If we assume the QC inspector was correct regarding the need for preheat, the QC inspector was properly performing his job and the quality program was properly functioning. Had this been other than an isolated occurrence, the QC inspector should have questioned the welder's qualification and had him reassigned as discussed in the response to Allegation #397.

NRC Allegation #441

It is alleged that:

The reason that the craft worker did not know the requirements was that no one had informed him, and because no one enforced the regulations. The production foremen should have instructed the craft about what to do, and quality control should have been enforcing the regulations. It was, however, common to see QC personnel sitting around at their desks, reading newspapers, instead of doing their jobs by actively engaging in surveillance of the construction work being done. (3/21/84 Anon. Aff., Attachment 8, at 4.)

225. As discussed in the response to Allegation #440 and the previous paragraph of the anonymous affidavit, six feet of weld were ground out and repaired as a result of the QC inspector apparently doing his job.

Had this been other than an isolated occurrence, the QC inspector should have questioned the welder's qualifications as discussed in the response to Allegation #397. As no specific information is available to fully investigate this allegation, a more specific response is not possible.

SAFEGUARDS INFORMATION

Responses to NRC Allegations #443-449 (paragraphs 332 - 355, including Attachments 4 and 5) contain Safeguards Information as defined in 10 CFR 73.21(b). This information is furnished separately in Enclosure 3. This information must be protected from public disclosure in accordance with the requirements of 10 CFR 73.21.

SAFEGUARDS INFORMATION

NRC Allegation #450 and #460

It is alleged that:

ASTM A-325 and ASTM A-307 are not P1 Materials. PG&E does not have the authority to group materials at will into the ASME P1 Materials group. Pullman did not have a welding procedure to cover welding mechanical fasteners, failed to track essential variables in the application of Weld Procedure Specification 7/8, and failed to recognize the code non-compliance. (Lockert Aff. at 14.)

226. This allegation is without merit since it is based upon Mr. Lockert's incorrect analysis of PGandE letters DCL-84-067 and DCL-84-078. Pullman did have welding procedure specifications (WPS 7/8) for mechanical fasteners. Carbon steel fasteners, A307 type B, are covered by P1 WPSs, because this type is of plain carbon steel referenced by A36 (a P1 material) and listed as a P1 material in ASME Section III. SA 307 grade B was also listed as a P1 material in Code Case N71, approved November 1976 (see PGandE Response to Joint Intervenors' Motion to Reopen CQA, Breismeister, et al. Aff. at 12-13). More importantly, the issue of welding A-325 bolts is completely moot since, as described in PGandE letter DCL-84-161 dated April 27, 1984, the pipe support design has been revised to require that the base plates be welded in lieu of relying on the A-325 welded bolt connections.

227. While this issue is moot because of the design change noted above, PGandE has responded to Mr. Lockert's allegations to fully complete the record. Mr. Lockert identifies three general concerns on pages 6



through 15 of his April 10, 1984, affidavit. Many of these concerns are addressed in PGandE letter DCL-84-113, and they are each addressed below on a paragraph-by-paragraph basis.

228. In paragraph 1.a, Mr. Lockert speculates that since the chemical composition of A-325 does not specify upper limits on carbon and manganese, these elements are not controlled. Experience with such bolts provided evidence to the contrary. Manufacturing ease and cost considerations dictate that the carbon content be no higher than necessary to meet strength requirements. Small diameter A-325 bolts are essentially AISI 1035-1042 steel.
229. These analyses were known based on Certified Material Test Results (CMTRs) obtained by Pullman. Attachment 6 shows typical A-325 CMTRs. These analyses were also confirmed by chemical analyses of four A-325 bolts selected at random at the job site. The results of these chemical analyses are shown in Attachment 7.
230. In paragraph 1, Mr. Lockert incorrectly states that "the bolts were never intended for welding and a search of available reading material shows no studies showing the bolt in the welded condition to be acceptable." The AISI composition materials from which A-325 bolts are made are listed as weldable in Weldability of Steels by Stout and Doty.

Although this text recommends preheat for the general case, preheat is not necessary for small, unrestrained bolts as discussed in response to 3.f below. Weldability of Steels is the basic reference for this type of application and it is difficult to imagine why such a commonly used text was not consulted by the allegor.

231. In paragraph 1.b, Mr. Lockert continues to speculate that the phosphorous and sulfur content is at the worst permissible levels. Mr. Lockert apparently does not know that steel mills control these elements to minimize manufacturing problems and to produce products that are more widely acceptable and saleable than if the bolts were at the limits. These considerations result in acceptable phosphorous and sulfur content being provided. This has been confirmed by the results shown in Attachments 6 and 7.
232. Additionally, Mr. Lockert is misleading in stating that phosphorous and sulfur are restricted to a maximum of 0.04% in Linnert's text book. The cited references have been taken out of context by Mr. Lockert. The first Linnert reference (pg. 67-69) refers to filler metal composition, whereas A-325 is base metal. The second Linnert reference (pg. 430-432) refers to high strength steel in conditions of high restraint which also did not exist for these small bolts. Thus, both of Mr. Lockert's citations are in error for the application of concern.

233. Furthermore, Mr. Lockert fails to mention that free machining steel base metal with much higher sulfur levels than those in A-325 can be welded, as shown in Weldability of Steels. Such steels with sulfur contents several times the A-325 maximum can be welded. The actual sulfur and phosphorous contents for typical A-325 bolts are shown in Attachments 6 and 7. These values confirm there is no concern regarding the content of these elements.
234. In paragraph 2, Mr. Lockert presents a "strawman" and states that A-325 is not explicitly listed as a P-1 material. This was readily conceded in PGandE's prior responses and documented on discrepancy reports. The purpose of DCL-84-067 was to provide proper technical perspective, by noting the similarities to A-105 material and providing other technical justifications.
235. In paragraph 3, Mr. Lockert has implied that there are alloy elements in these bolts. This is also wrong. Alloys are not intentionally put into these small bolts because it is technically unnecessary for small diameter bolts and because it is unnecessarily costly. A-325 bolts have traces of alloying elements as do plain carbon steel categorized as P1. These traces are not significant from a weldability viewpoint.

236. Mr. Lockert is clearly incorrect in stating that "no one has taken the time and money to find out" the composition. Attachment 6 presents three CMTRs for representative A-325 bolts at Diablo Canyon. Attachment 7 presents chemical analyses for four bolts selected at random when this issue was initially raised. These data demonstrate that the time was taken and the money spent to know and confirm the factual basis for PGandE's position.
237. In paragraph 3.d, Mr. Lockert has attempted to confuse the issues by discussing the ability to detect cold cracking by visual inspection. Lockert has incorrectly indicated that the cracking is under the weld metal in the heat affected zone (HAZ) and not generally visible. Mr. Lockert has conveniently overlooked the fact that the bolt HAZ is visible at the weld toe, and that toe cracks are the most common kind of HAZ cold cracks. Test welds partially identified in DCL-84-078 were conducted at the job site under NRC surveillance and were subject to liquid penetrant examination. No cracks were found. The bolts were torque tested and no cracks were revealed.
238. Additionally, Mr. Lockert has also introduced the subject of a hardened metallurgical microstructure, martensite, and incorrectly concluded that the bolt HAZ would be martensitic. Two-inch long, 5/8-inch diameter

bolts cannot dissipate heat rapidly, regardless of what they are welded to. Therefore, the cooling rates in the bolt were sufficiently slow to avoid the hardened microstructure about which Lockert has wildly speculated. The fact is the A-325 bolts welded at the job site under NRC surveillance, without preheat, as described in DCL-84-078, did not have hardened microstructures. These bolts were subsequently cross sectioned, examined, and hardness tested. The hardness was comparable to AISI 1040 steel in a non hardened condition or a severely tempered condition. Microscopic examination of the bolt HAZ resulting from the weld thermal cycle confirmed there was a nonhardened, primarily pearlite-ferrite microstructure. A few isolated grains of martensite were found surrounded by other nonhardened constituents. The cross section examinations showed the four bolts to be crack free. Both Rockwell hardness and Vickers microhardness tests indicate a nonhard structure (HRC 27 and HV 279) as shown in Attachment 8.

239. In response to Mr. Lockert's comments in paragraph 3.f, the reason that the A-307 bolt allowable stress was used was because the A-307 allowable stress is the same as for carbon steel in the unheat treated condition. This assumption was made to conservatively account for any strength reduction that resulted from welding.

240. Mr. Lockert questioned engineering approval of A-307 bolts with larger diameters than the welded A-325 bolts. This approval was due to the inherent conservatism of the Diablo Canyon Project. The DCL-84-067 reference to "A-325 properties being changed from those associated with a quenched and tempered condition to those associated with a normalized condition," had a clear meaning in context. The meaning was that the bolts were no longer considered hardened and the allowable stress was reduced. Mr. Lockert has taken the statement out of context and incorrectly implied an assumption of a normalized heat treated condition. There was no assumption that the bolt was in the normalized condition. The DCL-84-067 statement was simply that the strength and allowable stress values were conservatively reduced.

241. Furthermore, Mr. Lockert states that A-307 bolts are not P1 material. He is wrong again. As noted above, A-307 grade B is a P1 material (see Code Case N71 [1977-1980] and current ASME III.

242. In summary, these allegations are without merit and, as stated earlier, moot since welded A-325 bolts are no longer used in the plant design. However, the A-325 bolts on the supports of concern were torqued to engineering requirements and found to be sound. This installation practice was a meaningful test of the installed condition and would reveal surface or subsurface cracks of a critical size.

243. Additionally, sample A-325 bolts were welded without preheat and were subsequently examined and tested. The torque tests were also acceptable. The visual and liquid penetrant examinations were also acceptable. The bolts were subsequently cross sectioned, examined, and hardness tested and found to be crack free, not hardened, and acceptable.

SAFEGUARDS INFORMATION

Responses to NRC Allegations #453-455 (paragraphs 356 - 365) contain Safeguards Information as defined in 10 CFR 73.21(b). This information is furnished separately in Enclosure 3. This information must be protected from public disclosure in accordance with the requirements of 10 CFR 73.21.

SAFEGUARDS INFORMATION

NRC Allegation #456

It is alleged that:

PG&E's February 17, 1984 letter to the NRC takes credit for having prepared the final approved drawings (original and revisions), without exception. That is false. A September 18, 1973 Pullman audit revealed, "PG&E is not approving the design of any 2" and under Hangers." (Exhibit 25) (Hudson Aff. at 11.)

244. Contrary to the allegation, PGandE does review and approve all design Class 1 drawings, including those of hangers for pipe lines two inches and under.
245. Since project inception, PGandE drawing 049243 has provided standard pipe support designs to be used by contractors. In the time frame of the referenced audit, pipe supports installed in compliance with drawing 049243 did not require further PGandE review. Any support which deviated from the standard drawing did, however, require PGandE approval. This philosophy was changed in 1979 to require the 100% review and approval criteria indicated above. All activities were conducted in accordance with the established procedures in effect during the respective time periods.
246. This allegation misinterprets the September 18, 1973, audit by implying that small bore support drawings were not required to be approved by PGandE in this time period. In fact, the point made by the September audit report was that, at that instant in time, the small bore field run design was still in the isometric approval status, although some hangers



were installed as temporary supports. As such, PGandE had not approved the drawings. As stated in the audit, "When design of 2" and under hangers are resumed, compliance to ESD 223 will be assured by a follow up audit." Several such audits were performed in late 1973 and early 1974.

247. The allegation is unsubstantiated by the facts. No corrective action is required.

#### NRC Allegation #457

It is alleged that:

Pullman's training program did not address the technical objectives of the project. While Pullman's training program did cover some of the Pullman procedures (ESD's) the training program did not cover:

- 10 CFR 50, Appendix B, Quality Assurance Criteria
- 10 CFR 21 Reporting of Defects and Noncompliance
- ANSI N45.2 Quality Assurance Program Requirements
- ASME Boiler and Pressure Vessel Code- Sec. III, VIII, (sic) and IX
- ASME Pressure Piping Codes B31.1 and B31.7
- AWS D1.1 Structural Welding Code
- AISC Steel Construction Manual

Training in the above mentioned documents is necessary because Pullman procedures, like any in-house procedure, can not (sic) cover every possible application that the inspector will encounter in the performance of his duties. Knowledge of what stands above the Pullman procedure aids the inspector in finding the applicable requirements for quick resolution of problems and provides feedback to the company on how well the procedures are being applied to work performed in the field. (Lockert Aff. at 2-3.)

248. The allegation is false where it states that the Pullman training program did not cover 10 CFR 21 or ASME/ANSI Pressure Piping Codes B31.1 and B31.7. These documents are required reading during the training program for all inspectors (as can be seen by Mr. Lockert's own signed-off reading list, Attachment 9).
249. It is not necessary to require inspectors to read 10 CFR 50 Appendix B, as the Pullman QA Manual adequately addresses each of the 18 criteria, although not in a criterion-by-criterion manner.
250. As far as the other documents are concerned:
- ASME Sections III and VIII only apply in a very limited degree to Pullman's scope of work at this site and are, therefore, not a part of the training program.
  - AWS D1.1 is the basis for PGandE Specification 8833XR and ESD 243, both of which are required study material.
  - Applicable sections of ANSI N45.2 are incorporated into PGandE Specifications 8711 and 8833XR (and others), as well as ESDs included in the Pullman training program.
  - Applicable sections of AISC Steel Construction Manual are used extensively throughout Pullman ESDs, where necessary.

251. It can thus be seen that the technical aspects of the Project were adequately addressed for all inspectors, including Mr. Lockert. It can also be pointed out that there is only an infrequent need for inspectors to interpret the code; they just need to understand what the code covers and the requirements of the specific inspection activity. The basic knowledge required for the performance of the job was, thus, available to each inspector.

252. No action is required.

NRC Allegation #458

It is alleged that:

Pullman did not adequately explain in the training program the Quality Assurance elements, the capabilities and limitations of those elements, to be employed on the job. For instance, it was only after I had talked to the NRC that I learned the Pullman Discrepancy (sic) Report (DR) was word for word the same thing as a Non-Conformance Report (NCR.) Pullman QC inspectors did not write DRs but were instructed to communicate quality problems through a Deficient Condition Notice (DCN). The DCN was subject to engineering approval before the DCN could be inserted into the QA system and in that way the inspector's ability to perform independent of production in reporting of problems was subverted. (Lockert Aff. at 3-4.)

253. Pullman's training program for all inspectors begins with study and testing on Pullman's QA Manual. One section, KFP-10, addresses nonconformances and the reporting of same. Also included in the training program for all inspectors is the required study of ESDs 240 (Nonconformances) and 268 (Deficient Condition Notices). These ESDs

explain the definition, use, initiation, routing, and disposition of these reports. ESD 240 defines all nonconformances and explains that they shall be reported on a DR (Discrepancy Report). ESD 268 explains which conditions are considered deficient and the procedure for reporting them. Mr. Lockert, himself, has read the required ESDs, signed his training records as having done so, and used the system.

254. DCNs are the document vehicle for initially identifying a nonconforming item. The DCN is routed to Engineering for review, input (an aspect not mentioned in the allegation), and concurrence on the proposed disposition. Engineering may analyze and clarify a situation to the satisfaction of an inspector and the DCN could then be voided with the concurrence of the inspector or his first line supervisor. However, if the inspector chooses to pursue the issue upwards to management, he may do so through established channels. At no time can Engineering unilaterally keep the DCN from going through the complete review cycle for processing. If the deficient condition can be reworked in house, all work is conducted as dispositioned on the DCN. If PGandE is required to be notified, the DCN is converted into a DR and dispositioned accordingly by PGandE.
255. No action is required.

NRC Allegation #459

It is alleged that:

Pullman QC inspectors were specifically instructed to only consult Pullman procedures (ESDs) for evaluation of a component or activity's adherence to quality objectives and code compliance. Further, Pullman inspectors were specifically instructed by Pullman management to accept all conditions falling outside the scope of Pullman procedures. The ANSI Level II inspector is required as a minimum to evaluate (sic) inspection and test results which would include referencing the appropriate codes and standards when necessary. (Lockert Aff. at 4.)

256. Contrary to the allegation, Pullman inspectors were not instructed to "accept all conditions falling outside the scope of Pullman procedures." There were no restrictions which precluded them from writing up conditions outside the Pullman procedures, which would then allow others to address any identified problems. It was not, however, the responsibility of the inspector to pursue an issue through the analysis phase. This allegation appears to arise out of Mr. Lockert's previous allegation about rejection criteria for A-490 bolts not being in ESD 243. If this is the case, the specifics have been addressed in PGandE response dated March 19, 1984, to Joint Intervenors' Motion to Reopen on CQA, Geske, et al. Aff. at 21.
257. Pullman's procedures (ESDs) contain all of the specific requirements necessary to fabricate and inspect the portions of the power plant within the scope of Pullman's contract. All ESDs are written to be in compliance with all applicable codes and specifications. Due to the fact that codes and specifications are the bases for all ESDs, only a

limited number of editions of the codes and specifications are maintained. This is done so that the available copies can be controlled in order to ensure that they are current with all revisions. These copies are, however, readily available on an as-needed basis.

258. ANSI Level II inspectors can get the appropriate information, in most cases, from the ESDs. If further information is required, the actual copies of the codes and specifications are, as stated above, always available.

259. No action is required.

#### NRC Allegation #462

It is alleged that:

12) On September 25, 1980 an internal Pullman audit (Exhibit 13) admitted that two NDE technicians were certified for advanced (Level II) (sic) responsibilities, despite "letters in their personnel files stating they are not qualified to perform Level II functions...." Pullman's "solution" was for Mr. Geske to backdate letters to July 24, 1980 (Exhibit 14) that said the opposite -- that the two men were qualified. I do not believe that rewriting history is any way to solve quality problems. (3/22/84 Hudson Aff. at 7)

260. This allegation emanates from an audit finding of Mr. Hudson, which he subsequently signed off to indicate that the approved corrective action had been completed.

261. Mr. Hudson's original audit and his allegation failed to reference letters, dated January 11, 1980, in the personnel files. Those letters certified the two NDE technicians to ASNT Level II. By such letters, the two NDE technicians were authorized to perform MT examinations with the restriction that all results were to be recorded with photographs which would be subject to ASNT Level II interpretation and ASNT Level III review. (See Attachments 10 and 11.) Daily inspection reports and process sheet sign-offs have been reviewed and, as required, all the inspection reports of the two inspectors were evaluated by a Level II and reviewed by a Level III technician.
262. The two letters referred to in the allegations were signed after July 24, 1980, by a Level III who had supervised the two NDE inspectors during completion of interpretation training. The supervisor had been transferred to another Pullman project and was sent the standard certification letters for approval and signature after his departure. The date of July 24, 1980, indicated the date when the two satisfied the requirements of ESD 235.3.1B and when the supervisor considered that they were certified for all Level II responsibilities.
263. While it may appear that there was a technical violation of ESD 235.3.1.B for a period of time, the individuals performing MT examinations were qualified for the work they had performed and their work was reinterpreted, reviewed, and accepted by qualified Level II and Level III technicians.

264. No problem existed, and no corrective action is required.

NRC Allegation #463

It is alleged that:

13) I also challenge the accuracy of QA Manager Harold Karner's NDE qualifications records. In 1979 when he was originally certified at Diablo, Mr. Karner's certification did not cover NDE. (Exhibit 15) But on July 27, 1981, when Mr. Karner was recertified after the required two years, he was certified as Level II for Magnetic Particle Testing (MP); Radiography (RT); and Liquid Penetrant Testing (LPT), as well as Level I for Ultrasonic Testing (UT) (Exhibit 16). From my own experience as the internal auditor with Mr. Karner during that general time frame, I know he could not possibly have obtained the 600 hours of required practical experience even for MT -- let alone the other two disciplines. (3/22/84 Hudson Aff. at 7-8.)

265. Mr. Karner was first certified as a Level II technician in 1974, 1975, and 1976. He was recertified by Pullman Power Products as a Level II technician in MT, PT, and RT on July 24, 1978, and again on June 4 and November 2, 1979. Contrary to the allegation, recertification is required by Pullman every three years, not two years. On May 6, 1982, Mr. Karner was certified at Diablo as a Level III technician in these disciplines, not a Level II as asserted by Mr. Hudson (Attachments 12, 13, 14, and 15). The date of July 27, 1981, is not the date of certification but rather is merely the date of the handwritten memorandum of Mr. Hudson which lists Mr. Karner's qualifications as of that date.



266. Contrary to the allegation, under the controlling requirements of SNT-TC-1A, 600 hours of experience is not a requirement once a person is certified as a Level II technician. Prior to obtaining his first Level II certification, Mr. Karner fully satisfied such requirement.
267. There is no substance to this allegation, and no action is required.

NRC Allegation #464

It is alleged that:

14) In 1976 Pullman reported that Mr. Geske allayed concerns about 1200 suspect weld attachments by reinspecting 314 with magnetic particle tests in four days. (The attachments had been in question due to noncompliance with preheat requirements.) Geske examined (sic) 145 welds one day, 95 on a second day and the remaining welds over the next two days. They all passed. Unfortunately, the maximum possible number of magnetic particle exams that an inspector can perform in a day is around 50. The 1976 inspection findings are enclosed as Exhibit 17. (3/22/84 Hudson Aff. at 8.)

268. The allegation by Mr. Hudson, who has not been certified as an NDE technician, reflects his own limited knowledge and understanding of the MT examinations that were conducted. Attachments such as lifting eyes and shims are generally small. Magnetic particle examination can be accomplished very quickly in such cases. The records have been reviewed and show that the welds were grouped together in common locations. This permitted a qualified Level III technician, such as Mr. Geske, to complete the examinations in the time indicated.

269. The allegation has no merit, and no action is required.

NRC Allegation #466

It is alleged that:

17) During the early years of construction QA/QC personnel intermingled responsibilities with production personnel. Because of this phenomenon, the quality of early audits was sacrificed beyond repair. For example, part of the reason for the informal, unprofessional nature of 1971 and 1972 audits (Exhibits 20,21) is that they were performed by individuals identified in the signature log (Exhibit 22) as the shop and field engineers. It appears that the shop engineer even audited the shop. Due to their unreliable nature these audits could not reasonably substitute for required audits, such as for the welding program. Another example of intermingled responsibilities was the first QA/QC manager on jobsite also performed the duties of the Chief Field Engineer (Exhibit 22A) (3/22/84 Hudson Aff. at 9.)

270. During the time frame cited in this allegation, the M. W. Kellogg Company was in compliance with the existing interpretations of 10 CFR 50, Appendix B, and the guidance documents then available to the industry. This is evidenced by ASME having issued both an NA and an NPT stamp based on Kellogg's Quality Assurance Program in October 1972. Internal audits were only a portion of the audit program employed to meet the requirements of 10 CFR 50 Appendix B, Criterion XVIII. M. W. Kellogg's requirements for auditor independence for internal audit were issued in procedure KFP-18 in February 1971.

That procedure provided the following:

The field QA/QC manager [or] the Project Resident Construction Manager or Chief Field Engineer shall initiate internal audits. Audits are made by personnel not having direct responsibility in the area of the Quality Assurance Manual Section being audited.

271. A review of Exhibits 20 and 21 provided by Mr. Hudson confirms that the audits were conducted by personnel who did not have direct responsibility for the area being audited, and the audit reports were directed to the field QA/QC manager. The Pullman QA manual and internal program was reviewed and approved by PGandE, the State of California, and ASME.
272. While, for six months, Mr. Fink did act as the Chief Field Engineer while he acted as the field QA/QC manager, he did so only during initial startup of the job by Pullman on site. During this period, he was the only field engineer on site, and there was no construction work done.
273. There is no evidence that internal audits were to "substitute for required audits" as alleged. Instead they supplemented Pullman corporate management audits. NRC Inspection Report 50-275/83-37 indicates:

A review of corporate management audits, performed in accordance with Procedure XVIII-1, reveals a history of

Quality Assurance Program audits based upon checklists following 10 CFR 50 Appendix B Criteria. This established a comprehensive corporate audit system which appeared to review all field QA program facets.

274. Weaknesses in the Pullman internal audit program prior to 1978 have previously been identified and resolved by PGandE (NCR DCO-78-RM-004). These weaknesses had no significant impact as NRC Inspection Report 83-37 further concluded:

Even though the internal audit program, implemented by on-site personnel, (prior to 1978) was determined to be of a marginal quality, a redundant program of comprehensive corporate audits was performed concurrently. Based upon an examination of the findings identified in corporate and internal audits, there did not appear to be any adverse impact on quality-related activities as a result of the inadequate description of the internal auditing program. The inspector concludes that, with both programs operating simultaneously, sufficient records are available to assure the necessary criteria of Appendix B were being audited periodically. This conclusion is based, in part, on the absence of recurring significant audit findings.

Thus, the allegation has been fully addressed, and no further action is required.

NRC Allegation #467

It is alleged that:

18) The practice of intermingling QA/production duties continued into 1976, as a QC weld inspector named Art Mullis inspected the same drawings he had prepared as a field engineer, (assigning field weld numbers and weld symbols). (Exhibit 23) (3/22/84 Hudson Aff. at 9.)

275. Once again, Mr. Hudson has manufactured an allegation based on first impressions rather than an investigation of the facts.
276. Mr. Mullis was never a field engineer for Pullman. He was hired and acted solely as a QC inspector. Contrary to the allegation, the drawings referred to are not design drawings. The first drawing was prepared by Mr. Mullis and was merely a sketch that located field welds as an aid to QC inspection. There are no weld symbols on this sketch. The second drawing, which is dated July 7, 1982, was not prepared by Mr. Mullis but rather by Pullman Engineering. The drawing states on its face, "Welds on this sketch are identified individually for walkdown and subsequent work identification."
277. There is no merit to this allegation, and no action is required.

NRC Allegation #468

It is alleged that:

19) Contrary to Pullman's assertions, in response to the NSC audit, the quality of QA/QC suffered due to these conflicts-of-interest. To illustrate, Mr. Mullis accepted

his own practice of having one process sheet for five weld joints. His was also the xeroxed signature for numerous (sic) blank weld process sheets (Exhibit 18, supra.) (3/22/84 Hudson Aff. at 9, see also Id., para. 15, at 8.)

278. Prior to 1979, Pullman used a single process sheet for multiple weld joints located at the same connection. Restraint numbers were clearly identified, as was the connection number. The connection number consisted of a field weld number (FW) and a letter designation. Standard process sheets were issued. The restraint and connection numbers (weld number and letters) were filled in, and each designated process was inspected and accepted by a qualified QA inspector on an individual basis. The signatures of the individuals who approved the form and the processes identified on the form may well have been in place prior to the inspections; the inspector's signature was entered only after the welds had been inspected. Contrary to the allegation, Exhibit 18 to its supporting affidavit shows that Mr. Mullis, as inspector, did not duplicate his signature on the process sheets.
279. The practice of multiple designation has been changed for purposes of improving workability and traceability, such that an individual process sheet is used for each individual weld. Both practices, however, are in accordance with the applicable approved procedures and requirements.
280. No problem exists with the documentation, and no further corrective action is required.

NRC Allegation #470

It is alleged that:

3) Actually the problem was worse. In effect there was no formal QA program for pipe supports and pipe rupture restraints. The problem first was identified in a November 1973 audit (Exhibit 5) which conceded that the QA Manual skipped pipe supports and pipe restraints. Instead there was only ESD-223, the installation procedure which the auditor called "in essence, an 'alternate QA program' approved by the Resident Mechanical Engineer, instead of the Director of QA as required. (Id.) (3/22/84 Hudson Aff. at 4.)

281. The deficiencies in Pullman's QA program which are noted in this allegation were reported in the PGandE audit in 1973. Subsequently, Pullman revised its QA program to include pipe supports and rupture restraints, and the revised program was submitted to PGandE's Corporate QA Manager for approval. The program was approved on December 11, 1973. The reinspection was completed and closed out by PGandE on January 15, 1974.
282. All pipe supports and rupture restraints that were installed under the original ESD 223 were reinspected and were replaced or repaired, if necessary, or accepted. Each was properly documented in accordance with the new program.
283. This allegation raises nothing new, and since the condition was corrected, no further corrective action is necessary.

NRC Allegation #471

It is alleged that:

4) Although Pullman [sic] identified many deficiencies of ESD 223 in 1973, the company did not learn its lesson. The NSC audit repeated similar findings in 1977. (Hudson Aff. at 5.)

284. The 1973 PGandE QA audit of the M. W. Kellogg Quality Assurance Program, which is actually referred to in this allegation, identified that pipe support and rupture restraint work was not covered under the main program. This work was being conducted under what was considered by the auditor as an "alternate QA program" under the provisions of ESD 223. The auditor evaluated ESD 223 as a QA program and identified eight programmatic deficiencies. In resolving this audit, Kellogg developed the Pipe Support Quality Assurance Manual for pipe support and rupture restraint work. This manual was approved by PGandE on December 11, 1973. A review of the NSC audit reveals that there were no programmatic findings in these eight areas except for two items in the area of document control. The area of document control identified was that there was no procedure for control of ESDs or Special Quality Assurance Procedures. Contrary to the allegation, as a result of the various audits over time, M. W. Kellogg did "learn its lesson" and improved its QA program on pipe supports and rupture restraints.
285. No further action is required.



NRC Allegation #472

It is alleged that:

5) A January 10, 1977 memo from Pullman QA manager J. Runyan explained another major point: The pre-December 1973 pipe supports were installed "prior to implementing the inspection program" (Exhibit 6) (Hudson Aff. at 5.)

286. The January 10, 1977, memorandum referred to in the allegation simply acknowledges the previously mentioned fact about deficiencies in the Pullman QA program four years before in 1973. The memorandum, however, also lists the steps that were "taken" to ensure that the requirements of the new ESD 223 were met. The memorandum concludes, "It is my opinion that this program will insure [sic] the present installations are, as a whole, meeting the requirements of ESD 223." Rather than show the continuous deficiencies, the memorandum demonstrates compliance.

287. No further corrective action is required.

NRC Allegation #473 and #474

It is alleged that:

6) A November 13, 1978 memorandum from Pullman's Senior QA Engineer R. J. Manning (Exhibit 7) conceded that "in the past" Pullman "did not conduct audits or practices to ASME or 10 CFR 50, but I feel it very essential to do so now." As demonstrated by my own personal experience, the author's advice was ignored. From my reviews, I know that the early audits which existed were well-intentioned, but crude, uncontrolled and informal. They were too sloppy to constitute a minimal program. For example, a 1973 audit referenced conclusions about pipe rupture restraints to the contract for pipe supports, which didn't apply to the work in question. (Exhibits, Supra.) (3/22/84 Hudson Aff. at 5.)

7) Until at least November 1978, some parts of the QA program had never been audited. As revealed by Mr. Manning, "The Diablo Canyon program has been audited extensively only in hardware areas. The entire program has not been evaluated." (Exhibit 7) (Hudson Aff. at 5.)

288. Contrary to Allegation #473, Pullman did audit the Diablo Canyon Project to the requirements of 10 CFR 50 or ASME. In order to qualify for NA and NPT stamps from ASME, Pullman was required to commit to and did audit its projects according to the requirements of ASME. Consistent with such requirements, Pullman established its QA Manual and QA procedures which required audits to procedures which satisfied ASME. Management audits of the Diablo Canyon Project were conducted by Pullman on a regular basis beginning in 1972 (Attachment 16) in addition to internal audits. Those audits were conducted to ensure compliance with Specifications 8711 and 8833XR. While neither specification specifically references 10 CFR 50, each specifies the criteria to be met by Pullman's QA program. These criteria, in their substance, address the 18 elements of 10 CFR 50, Appendix B. The 1973 PGandE audit specifically found, "M. W. Kellog's [Pullman's] QA Manual complies with Section 4 [Quality Requirements] of the Specification." The quality requirements for Specifications 8711 and 8833XR are identical.

289. J. R. Manning's memorandum followed the NSC audit of Pullman in 1977 and can be seen as an exhortation that the prospective corporate audit of the project be in the form of 10 CFR 50 or ASME to guarantee that the Pullman QA program satisfies third party review by NRC or ASME. The NRC Staff in its review of the Pullman corporate audit

program determined that, while the elements of the QA program were general, there was "a history of Quality Assurance Program Audits based on checklists following 10 CFR 50 Appendix B criteria" (NRC Inspection Report No. 50-275/83-37 at 7-8).

290. Contrary to the allegation, it was a PGandE audit, not a Pullman audit, which addressed both piping and rupture restraints. As discussed above, the QA requirements for Specifications 8833 and 8711 are the same.

291. Contrary to the implication of Allegation #474, the Pullman Diablo Canyon QA program was audited both in hardware and software areas prior to 1978. Subsequent to a 1978 PGandE audit of a Pullman audit (PGandE Audit No. 80422), extensive additional effort was expended just in the hardware area of the Pullman program because of PGandE findings. This additional audit effort is what is referred to by Mr. Manning in his memorandum. PGandE found no reason to require an additional audit effort in the program portion of the Pullman QA program.

) 292. Pullman's QA program has been audited since the contract began to the substantive requirements of 10 CFR 50 and ASME. Deficiencies found by the audits by Pullman or PGandE have been corrected, and no further corrective action is required.

NRC Allegation #475

It is alleged that:

11) I decided to thoroughly research one of the 95 deficient files. I chose Pullman's NDE supervisor Don Geske, who certainly should have had adequate qualification records. Reviewing Mr. Geske's file revealed the magnitude of the inaccuracy. His records say he passed the three Magnetic Particle exams with flying colors -- a score of 98%. But records on the three specific exams record the following results for the supervisor: "\_\_\_\_\_, \_\_\_\_\_ [and] \_\_\_\_\_." There are no grades recorded for his performance on individual tests. The records are attached as Exhibit 12. (3/22/84 Hudson Aff. at 7.)

293. Mr. Hudson, once again, creates an allegation out of nothing. He alleges that the personnel file of Don Geske, Pullman's NDE Supervisor, does not record grades for his own performance on individual MT tests. While the Personnel Testing Record Sheet only indicates a composite score, Mr. Geske's file contains the actual tests which, when reviewed, clearly show the score he received on each individual test. Contrary to the allegation, Mr. Geske's file does accurately show qualification. No action is warranted.

NRC Allegation #351

It is alleged that:

Slotted holes on rupture restraints not in accordance with ASTM A-325 (NRC 4/27/84 letter summarizing Anon. Affs. dated 4/18/84 and 4/19/84, Exhibits 3 and 2, respectively.)

294. The allegation appears to stem from anonymous affidavits attached as Exhibits 2 and 3 to the GAP petition dated May 3, 1984. The

April 19, 1984, anonymous affidavit (Exhibit 2) is lacking in any detailed information that would allow response. On pages 2 and 3 of Exhibit 3, the anonymous alleger expresses concern that Unit 1 containment building exterior pipeway structure (pipe rack) bolted connections use washers that do not cover elongated bolt holes. This subject, the adequacy of using standard round washers for structural steel bolted connections with slotted holes, was fully addressed in PGandE letter DCL-84-162 dated April 27, 1984, which responded to a request from NRC Region V staff.

295. Recapping the information provided in PGandE letter DCL-84-162, the governing code, AISC, 7th edition, first printing, contained no specific requirements for connections using slotted holes. A few of the pipeway structure bolted connections contain slotted holes with bolts and washers that were installed in accordance with this edition of the AISC code. In subsequent printings of the 7th edition of the AISC code, requirements for adding plate washers to slotted hole connections were included to ensure that the bolts would have adequate bearing area against the base metal. Since the existing bolt washers do not completely cover the bolt holes, Engineering performed an analysis of the existing configuration of the pipeway structure connections. This analysis found that the washers provided sufficient contact with the base metal such that the actual bearing stresses were within allowable stresses given in the ASIC code.

296. The implications in the allegation that these bolts were not installed in conformance with the AISC code and that PGandE incorrectly accepted this condition are unfounded. The subject bolted connections were installed in accordance with the then existing AISC code, and engineering analysis demonstrates that the connections are fully acceptable.
297. Contrary to the allegation, ASTM A-325 does not relate to holes; it is a standard for bolts.
298. No further corrective action is required.

NRC Allegations #476 and 477

It is alleged that:

Inadequate documentation on A-325 and A-307 usage-Stokes rebuttal to PGandE responses DCL-84-067, DCL-84-078.

Inadequate material traceability back to certificate of compliance for the above bolts-Stokes rebuttal to PGandE's response DCL-84-067.

(NRC 4/27/84 letter summarizing Stokes 4/12/84 Aff. at 1-4.)

299. This issue was discussed in response to Allegations #450 and #460. As described in PGandE letter DCL-84-161, dated April 27, 1984, because PGandE decided to weld the piping support base plates and not rely on the bolted connections utilizing A-325 welded bolts, this issue is moot.

300. Mr. Stokes alleges inadequate material test documentation was prepared for welded bolts. His allegations are based upon an incorrect definition of code requirements for such documentation. The documentation for the A-307 and A-325 bolts used at Diablo Canyon equals or exceeds code requirements and is adequate. Contrary to the implications of the allegation, traceability is not required for pipe support materials in B31.1 or B31.7. Minor fasteners are specifically exempted from traceability requirements, even for pressure retaining components. Also, the ASME Section III, subsection NCA 3867.1, the successor code, does not require traceability for small diameter bolts. Thus, Mr. Stokes' allegations of documentation and traceability are based upon false premises since there is no code requirement for small bolts to be stamped for traceability.

301. No corrective action is required.

NRC Allegation #478

It is alleged that:

(3) Deficient training reinforced the problems, and perpetuated them. QA inspectors told me that their training consisted of reading ESD 223 for one week and being given a list of suggested reading. This list contained B31.7, B31.1 and other codes. In one conversation, when I asked if the QC inspectors were required to read the suggested readings, his reply was "no, we only had to know what B31.7 was, not what it says." "I and others thought that these codes had been incorporated into ESD 223 by management." This was, and remains, a wrong assumption. The inspectors undoubtedly performed to the best of their ability. However, the instruction,

training, and practices necessary to adequately perform their functions were deficient. The inspectors only discovered their "wrong beliefs" through discussions with better trained, more experienced inspectors from companies other than PG&E. (Stokes 4/12/84 Aff. at 4-5.)

302. This often repeated and unwarranted allegation was initially addressed thoroughly in PGandE response dated March 19, 1984, to Joint Intervenors' Motion to Reopen on CQA, Geske, et al. Aff. at 16-19. Mr. Stokes appears to be making judgments and allegations based on false statements and/or undocumented hearsay.
303. Mr. Stokes' statement that "QA inspectors . . . training consisted of reading ESD 223 for one week and being given a list of suggested reading" is inaccurate and false. As indicated in the earlier response:

"The first phase of the training program required by all QC inspectors is a self study and testing program. The written material which the inspectors are required to read includes Pullman's written engineering specifications, Quality Assurance Manual, QA Instructions, the study modules such as 'Fundamentals of Welding Inspection,' 'Introduction to NDE,' and other documentation concerning welding inspection. The prospective inspectors are given a series of approximately a dozen written and practical examinations dealing with various job functions and areas of knowledge necessary to perform the job of welding inspector. A passing grade of 80% is required on these examinations to display an acceptable degree of proficiency. Each prospective inspector is informed that if he or she cannot pass any particular test after the second time (which is usually a different test on the same subject), then termination will result.

In addition, other reading is required to be completed prior to going out to the field for the second phase of training. This reading includes other ESDs related to the welding inspector's job, applicable Code Sections, the Code of Federal Regulations, and sections of PGandE



specifications. It is not expected that a welding inspector know these supplemental ESDs as well as those he or she was tested on. The intent is for the inspector to be aware of where specific information can be located in the field as the need arises.

The second phase of the training and qualification of all weld inspectors prior to certification includes assigning the prospective inspector to accompany certified weld inspectors in the field in order to complete the field practical training. This field practical training involves becoming familiar with and using the documents employed and includes participation in the various aspects of their inspection duties. These activities are witnessed and satisfactory completion is attested to by a certified welding inspector. This portion of the qualification program normally takes from two to three weeks. Certification is not conferred upon an inspector until he or she has completed this phase of proficiency training to the satisfaction of the supervising Pullman QC inspector and the Pullman QA/QC Manager. The anonymous allegation totally neglects to mention this portion of the training, qualification, and certification program."

304. Applicable portions of the ANSI B31.7 and B31.1 Codes are a part of the required reading and are, in fact, "incorporated into ESD 223" and other ESDs, as applicable, "by management." Any wrong beliefs about the training program or the contents of the ESDs are the beliefs of the allegor, not the inspectors or Pullman management. The allegation is unfounded and no corrective action is required.

#### NRC Allegation #479

It is alleged that:

(4) In letter no. DCL-84-094, PG&E states, "Pipe support number 100-111, identified for NRC review by Mr. C. Stokes, resulted in a minor modification . . . This change was made for consistency with Project Standard Practices even though analysis showed the change was not necessary to meet acceptance criteria."

I don't know if PG&E reported other modifications performed during the not functional testing to the NRC. I do know of at least one other support which was modified during hot functional testing. I can not (sic) give the support number here. My informant would be immediately on the "firing" line. I will supply the support number to NRC inspector Isa Yin, if the NRC supplies a list of supports to me for which they know modifications have been performed. (4/12/84 Stokes Aff. at 5.)

305. PGandE letter DCL-84-094, dated March 6, 1984, was written to document modifications specifically resulting from allegations. The information contained in this letter was, and still is, accurate. However, in addition to NRC requested reviews, there are other ongoing activities as part of the normal design, construction, and operations processes. It is these activities which have identified the need for additional modifications. These additional modifications can be grouped into four general classifications or causes:

1. Heatup related items resulting from planned engineering walkdowns - sixteen small bore supports modified.
2. Operation maintenance items resulting from reactor coolant pumps 1-3 repair and valve maintenance accessibility requests - eleven small bore supports modified.
3. Discrepancy reports not associated with allegations resulting from document reviews for final filing - three small bore support modifications for engineering issues and three small bore support repairs for construction issues. Support 57-15 was modified for

Engineering reasons after submission of the referenced letter. Support 2169-12, which was the subject of an NRC design review, was repaired as a result of a Quality Hot Line call about its construction. However, there was no requirement to report either of these modifications to the NRC as they did not result from NRC-identified concerns.

4. Design changes resulting from the completion of reverification program issues - nine small bore supports modified for code boundary transition point changes and one small bore support modification for equipment nozzle qualification in the post-LOCA sample system.

306. Mr. Stokes' informant is clearly confused about the reasons behind Project activities at this time and NRC reporting requirements. The allegation is correct in that more modifications have occurred than were reported in DCL-84-094. The allegation is false, however, in suggesting that these changes resulted from NRC-requested investigations or that a requirement existed to report these modifications to the NRC. Therefore, no further action is required.

NRC Allegation #480

It is alleged that:

(5) In PG&E's answer to the intervenor's motion to reopen licensing issues on Construction Quality Assurance, "Affidavit of D.A. Rockwell, L.R. Wilson," Paragraph 3 states in part: "Since this contact is provided by the plate of the clamp to the Unistrut, the plate is not necessarily horizontal and may appear 'cockeyed.'" This statement is too incomplete to be meaningful. The use of the term "cockeyed" is not explained or supported nearly enough to support any conclusion that the clamping plates were correctly installed. If incorrectly installed, the clamp will tend to slip off the structural steel to which it is attached. See sketches below of correct installation compared to incorrect installation.

In both the examples above, the plate is "cockeyed." One is correct, and if installed correctly, should not be easily moved. On the other hand, the incorrect installation could slip easily. This fact can be checked by consulting engineering manuals from either Unistrut, Superstrut, or other brand names. (4/12/84 Stokes Aff. at 5-6.)

307. The term "cockeyed" has previously been explained. See the drawing of beam clamps attached as Exhibit 1 to PGandE response, dated March 19, 1984, to Joint Intervenors' Motion to Reopen on CQA, Rockwell, et al., Aff. However, for simplicity, this drawing only showed a single clamp attached to the beam, whereas these clamps are used in opposing pairs, as explained below.
308. The term cockeyed can be further explained by looking at this drawing and assuming different beam thicknesses under the toe of a clamp. It is readily apparent that when the beam thickness is changed, the top of the clamp will not remain in a horizontal position but may angle up or down with respect to the axis of the Unistrut. Correct clamp installation is

not dependent on the angle of the clamp. Further, neither of the sketches shown in Mr. Stokes' affidavit (p. 6) show the correct installation of beam clamps. The important issue is that regardless of the angle of the clamp, a single clamp could be dislodged. These drawings do not show a second clamp attaching the strut to the beam. Detail S222 and Detail S223 (Attachments 17 and 18, respectively) show the installation of beam clamps at Diablo Canyon. Beam clamps are installed in pairs. Due to the pairing arrangement, if a dislodging force were applied to the connection, it would supply a wedging force to one of the two clamps thereby preventing the clamps from dislodging. Therefore, since clamps are properly installed and since they are installed in pairs, Mr. Stokes' concern has no merit and no corrective action is necessary.

NRC Allegation #481

It is alleged that:

(6) In paragraph 5 as a remedy for possible slipping, PG&E states, "For support type S221, U-bolts were torqued and U-bolt nuts tack welded. For other support types, the Unistrut channel was directly welded to the beam flange." (sic) (Emphasis added) Based on my experience in the nuclear industry, the proposed fix by PG&E/Foley would do more damage than good. To my knowledge, there are no engineering documents presently available or in use that support the practice of welding Unistrut or similar material. In fact, the material used in making "Superstrut" and similar products should not be welded. In a phone call on 3/27/84 with a Superstrut Product Engineer, I was told that Superstrut is coated with an electro-plated galvanized chromate coating (an epoxy paint) which burns when welded, giving off toxic gases. Two problems result from welding it. (1) Air quality problems for the welder

and (2) the joint corrodes. The Product Engineer said he would never advise that Superstrut be welded when used as Class I supports in a nuclear plant near the ocean. He said that the material could be destroyed in one year if exposed to adverse conditions. (4/12/84 Stokes Aff. at 6-7.)

309. The strut manufacturer's weld strut material, and the strut connection devices. Welded strut is shown in their catalogues. Engineering knew of the strut weldability based on prior experience and tests. Contrary to the allegation, the welding of the unistrut has been addressed. The H. P. Foley Company has qualified WPSs for the welding of struts. There are numerous WPSs due to different essential variables; i.e., WPSs 10, 78, 80 and 90 are a few of the approved WPSs developed for the welding of strut material. The welded installation of strut has been inspected and accepted.
310. It is apparent from the above statement that Mr. Stokes is hopelessly confused. Even casual observation of the strut material that is installed at Diablo Canyon demonstrates that all strut material is galvanized, as required by specifications and purchase orders. Also, all cut edges and welds have been coated with ZRC (a zinc rich paint) in accordance with specifications. Mr. Stokes, in his conversation with a Superstrut Product Engineer, was obviously confused concerning strut channels which may be painted. Painted struts are not used at Diablo Canyon. Galvanized strut material has been installed at Diablo Canyon for longer than 10 years with no appreciable corrosion problems, even though the "nuclear plant [is] near the ocean."

NRC Allegation #482

It is alleged that:

(7) In reply to intervenor's Petition to reopen Construction Quality Assurance, Affidavit of H.R. Arnold, F.C. Breismesiter (sic) and R.K. Rhodes Paragraph 6. "During a planned review of existing brazing procedures for copper and stainless steel by Foley QA Personnel in September 1981, it could not be verified that stainless steel tubing PBS number MDU45 had been qualified in all braze flow positions (vertical-up, vertical-down, horizontal and flat) since the procedure qualification (sic) tests performed in 1977 did not include the vertical-up flow position. This variation was properly documented on Foley Non-Conformance Report (NCR) #8802-675 in accordance with approved procedures." (Emphasis added). The statement quoted above is in direct contradiction to the first line in Para. 1 and line, Page 1. "This allegation is completely false. The procedures in question were qualified prior to their use." (Emphasis added). To correct this problem, one worker was tested. Under ANSI B31.7 and ASME Section IX, each welder must be qualified to perform the work to which he is assigned. Foley's solution does not correct the use of the procedure from 1977 to 1981 for brazing a vertical-up joint as was originally stated in the procedure. Nor does it resolve the issue as to whether the brazers before 1977 were qualified to perform work. The test of one worker does not satisfy ASME requirements that each worker be qualified unless the worker tested was the only person on-site who was assigned the brazing work. Nor do the present tests qualify old work, since past work could be considered training thus not qualifying as acceptable work. ASME Section IX requires that the welder be qualified first before work is performed. There is a reason for this, which is to ensure that the work is performed correctly. The other point not sufficiently covered in Foley's reply is that "Neither the ASME Code nor Foley procedures require documentation of these inspections. Therefore none were documented." Nor in the statement that "ASME Section IX recognizes the function of independent mechanical test contractors such as Central Coast Lab, and does not require (sic) them to witness the actual brazing." (Paragraph 3, page 6 and 7). This is an example of Management's near-sightedness. Can they say that this documentation is not required in B31.1, B31.7, ASME Section IX, AWS D1.1-79 or 10 C.F.R? From my previous experience in the nuclear industry, it has been the practice to test and document

results therefrom for welders. This would certify that the weld was made by the specific welder and that the test results were for the welds performed by that individual. These logs and records were controlled and monitored by the QA. The policies at Diablo by PG&E, Pullman, and Foley are at the opposite end of the scale from what has been typical industry practice. Where documentation was in question, other plant owners considered it good engineering practice and a good policy to go ahead and provide documentation to prevent the problem of a future question. At Diablo, just the opposite is true. (4/12/84 Stokes Aff. at 7-8.)

311. Contrary to Mr. Stokes' allegation that there is a "direct contradiction to the first line in Para. 1 and line, Page 1," the first paragraph of the Arnold, et al. affidavit describes portions of the JI allegation which are "completely false." The following paragraphs in this response to the allegation describe why the new Stokes allegation has no technical merit and is false and misleading by omitting relevant background information. The facts presented in the Arnold, et al. affidavit clearly indicate that the allegation in JI #112 is completely false.
312. As stated in the Arnold, et al. affidavit at 3, it was determined in 1981 that the Foley braze procedure had not been qualified in the vertical-up position. This discrepancy was documented in an H. P. Foley nonconformance report (NCR) #8802-675. Mr. Stokes states in Para. 7: "To correct this problem, one worker was tested. Under ANSI B31.7 and ASME Section IX, each welder must be qualified to perform the work to which he is assigned." Mr. Stokes was incorrect in his assumption that only one worker was tested. The disposition of the NCR included a test of one brazer in qualifying the braze procedure specification, and a



test of all other existing brazers requalifying them to the new  
requalified specification.

313. The braze procedure specification was qualified for all positions  
all brazers were qualified for all positions including vertical  
Absolutely no changes were required in the braze procedure  
specification; it is the same today as the original specification  
was qualified in 1972.

314. All copper and stainless steel tubing is fabricated (tubing bent  
joints made) on a work bench and then installed in place. Since  
stainless braze seal end fitting is installed on a bench, the vast  
majority is installed with braze flow in horizontal or vertical  
position. There are few applications where a fitting is installed  
braze flowing in the vertical up position.

315. Since the procedure was qualified without any change, and all bra  
qualified for brazing in the vertical up position, and the vertical  
upflow position is seldom used, there is no reason to suspect that  
brazes made prior to 1981 are not adequate. These qualification  
brazer tests demonstrated that the deficiency involved only  
documentation and did not affect hardware. Additionally, and most  
important, all production brazes, whether in the vertical upflow  
other position, require QC inspection. This inspection verifies  
compliance with the braze procedure specification and that the pr

filler material flows to both ends of the stainless steel braze fitting. This visual inspection of brazed joints with preplaced rings is very significant, and provides a high degree of confidence that the work has been performed properly. Furthermore, all stainless steel braze fittings have been functionally tested during hydro tests. We are not aware of any brazed fittings, vertical upflow or any other position, failing during these tests.

316. A nonconformance in the H. P. Foley braze program was identified, documented, and effectively dispositioned. Mr. Stokes' allegation that management is nearsighted due to the fact that the ASME Code and Foley procedures do not require documentation of QC and/or mechanical test contractor witnessing brazing of qualification test specimens is totally without foundation. In addition, independent test laboratories are not required to witness actual brazing or welding on test coupons on which they are performing tests.

317. Mr. Stokes has reached his conclusion that PGandE or Foley management is nearsighted because the applicable codes do not require documentation of the witnessing of a braze or weld during qualification. Mr. Stokes states: "From my previous experience in the nuclear industry, it has been the practice to test and document results therefrom for welders." (Emphasis added.) The testing and test results for brazers and welders were documented in accordance with ASME Section IX requirements. The QC inspector who witnessed the brazing of test specimens did not document

his witnessing of the test nor was he required to do so. The Foley brazers have been properly tested and the performance qualification test results have been documented.

318. In short, Mr. Stokes has no basis for his argument of nearsightedness, and no corrective action is necessary.

NRC Allegation #483

It is alleged that:

(8) In a discussion with a friend, I was shown a Discrepancy Report written against Unit #2. This document listed many anchor and smaller supports which did not have acceptable full penetration welds at the stantion (sic) to pipe and were to be reworked. The problem with this work was that there had been no process sheets issued for the removal nor had the pipe been ultrasonically tested to ensure that the minimum wall remained after grinding away the old material. The new stanchions were installed without an ultrasonic test (UT) being performed. The tests were performed seven months later. Per ASME Section IX and ANSI B31.7, the ultrasonic testing should have been conducted at the time after removal and before new stanshions (sic) were welded in place. When ultrasonically testing this type of joint, incorrect readings are possible.

A worker who was familiar with this Discrepancy Report (DR) on Unit 2 realized the same problem might have occurred on Unit 1. I was shown a copy of a Preliminary Discrepancy Report listing about 15 supports in Unit 1 which the worker had determined had the same problem as the Unit 2 problem narrated above. I can supply the DR number on Unit 2 and the author of the Unit 1 DR. This will be supplied under similar conditions listed on a previous issue to Iso Yin. (4/12/84 Stokes Aff. at 8-9.)

319. Review of records indicates that the allegation refers to the removal of stanchions which occurred in 1977 following discovery that welders may

not have been fully qualified to perform installations (DR Nos. 3537 and 3538).

320. The stanchions were removed and reinstalled by qualified welders. Pullman procedures were revised and personnel were informed in order to ensure no further occurrence.
321. Contrary to the allegation, process sheets, or their equivalent, do exist for the removal of each stanchion. Contrary to the allegation, neither the related DR dispositions nor ANSI B31.7 required UT examination of the minimum wall thickness of the associated pipe. Records also indicate that the associate pipes were inspected and that there was minimum material removed, thereby obviating any need for a UT examination. The inspector who made the examination was qualified to determine whether a UT should be conducted. The associated pipes were examined both visually and with PT. ANSI B31.7 requires only that the surface be examined.
322. Contrary to the allegation, ASME IX does not apply to UT requirements for pipe installation. Rather, it applies only to welding qualification.
323. No code or specification requirements were violated by Pullman in the removal and reinstallation of the stanchions, and no further corrective action is required.

NRC Allegation #484

It is alleged that:

(9) In closing and as the only exhibit to this affidavit, I have a copy of a document which was scheduled to be issued to all field engineers to aid them in their work at Diablo. It was prepared by Bechtel Power Corporation. The title of this document is Field Engineer Pocket Hanger Reference. This document was sent to the field for issuing, but was recalled under the excuse that it contained errors which needed to be corrected. I and other engineers at Diablo had copies of this document. It contains valuable information to which an engineer could refer and rely upon during his work. In truth, this document represents Bechtel policy at previous jobs. Much of it is in direct contradiction to the procedures used to build Diablo. Had it been issued many problems would have surfaced in a relatively short time. Why is this true? The document puts at finger tip location contradictory guides, providing typical industry practice in many areas, to the procedures and management directives issued at Diablo. There are minor errors in this document. However, I have reviewed it and have found it to be a valuable and handy document to have when working in the field. It should have been checked, corrected, issued and used.

Enclosed are pages 1-10 and 1-11, "Notes: Pipe Insulation Chart." In reading these two pages several points are evident which were not complied with at Diablo: (1) vapor barrier requirements; and (2) the application of a double layer of insulation on high thermal lines. In PG&E's answers to the staff concerning stress walkdown, they tried to explain away interferences by local crushing of calcium silicate. Note, this is not acceptable on page 1-10.

Also enclosed is a copy of page 1-13, "Insulation Removal Request Flow Chart" and page 1-14, "Request for Insulation Removal." I am not aware of either of these procedures being followed at Diablo.

Also enclosed is a copy of Section 7, "Welding Instruction." On page 7-2, item 15, it is stated that there are no dihedral angle limitations for skewed T-joints. I feel this policy will cause problems by design personnel failing to consider welds shown as fillet as partial penetration groove welds unless a note specifically stated that it should be considered otherwise. I personally know many engineers will assume a fully effective throat for any weld indicated as a fillet. I

suggest a test at site on this point before a decision is made on how to represent a skewed T-joint. Also on page 7-5, see "Attachment 1." Either I don't understand this table or no allowance was added for the throat deduction for inadequage (sic) penetration. This last conclusion was also that of a pre-inspect engineer at Diablo Canyon.

Lastly, on pages 7-7 thru (sic) 7-10, I would like to point out the concise clarification of weld symbol terminology. Had this part of the book been in effect at Diablo, many questions would have been resolved (although many other questionable practices would have become evident to many field personnel). (4/12/84 Stokes Aff. at 8-11.)

324. Once again, Mr. Stokes raises his view that had the Bechtel Field Engineer Pocket Hanger Reference for Diablo Canyon ever been formally issued and distributed to onsite design engineering personnel, many of his concerns would have vanished. Unfortunately, this opinion was not shared by those most familiar with the document, and his statement demonstrates his failure to understand the nature of the document.

325. As was stated at the April 6, 1984, ACRS meeting, the referenced document was:

- printed primarily to aid PTGC and Pullman field engineers (as opposed to design engineers) working on pipe support construction in the field. It was never intended to be used and, indeed, was not used as a design document or a document to dictate or control the design process, nor was it intended to be used by Quality personnel in the conduct of their work.

- created with the intention of having a handy pocket compilation of information that would be of general use to PTGC and Pullman field engineers in the plant. It was of a size that would fit in a pocket for that purpose.
- distributed to PTGC and Pullman field engineers to help them orient themselves when they were in the plant.

326. The Field Engineer Pocket Hanger Reference for the Diablo Canyon Project was prepared in mid-1983 by the PTGC Pipe Hanger Group for use by PTGC and Pullman field engineers working on pipe supports at the Diablo Canyon jobsite. As stated in the front of the booklet, "It was designed and compiled to be a readily available field reference containing project unique information as well as standard engineering statistical data and supplier catalog figures. It should be recognized that the information in this book is transitional in nature and that the latest revisions of project documents, specifications, and codes shall govern in all cases."

327. Bechtel has published similar pocket reference booklets on other projects. In each case, the booklets are compilations of project unique information together with standard engineering statistical data and supplier catalog figures. Therefore, the booklets, contrary to statements in the allegation, do not represent Bechtel policy or typical industry practices. Furthermore, the project specific information

contained in the Diablo Canyon booklet is composed of extracts or condensations of Diablo Canyon Project specifications and design documents, and these references are identified in the booklet. These project references are the very documents used to design and construct Diablo Canyon and are definitely not "in direct contradiction" to them, as is mistakenly alleged. For example, Mr. Stokes appended copies of a total of 21 pages of the booklet to his April 12, 1984, affidavit (an act clearly in violation of the copyright infringement proviso on the third page of the booklet). Fifteen of these pages were taken directly from Project documents as follows:

<u>Booklet Page</u>	<u>Source Project Document</u>
1-4, 1-5	DCP Piping Specifications, Appendix H (PGandE Dwg 0490211)
1-6, 1-7, 1-8, 1-9	DCP Line Designation Table (PGandE Dwg 102040)
1-12	DCP Piping Insulation Specification (PGandE Dwg 101905)
1-13, 1-14	DCP General Construction Procedure M-26
7-1 through 7-6	Excerpted from ESD-223

328. When the booklets were initially delivered to the site, it was intended that they would be distributed to the PTGC and Pullman field engineers on a controlled basis. There was never any intent to issue this



document to design engineering or Quality personnel because of a concern, similar to that identified at Susquehanna Electrical Station, that these personnel would begin to rely on the pocket manual rather than the actual specifications and procedures. Unfortunately, before the controlled distribution could be made, a number of copies disappeared in an unauthorized manner. An attempt was made to recall the unauthorized copies, but requests to return the document were, in large part, unanswered. It is one of these unauthorized copies that came to be in Mr. Stokes' possession.

329. A controlled distribution was, in fact, later made of the remaining copies. Once inconsistencies were identified in the book and/or specifications were changed, the controlled copies were recalled for revision and reissued in a controlled manner. Recently, the need for further revisions was identified. The controlled copies were once again recalled and are presently being updated. It is expected that they will be reissued on or about July 1, 1984, to the appropriate personnel. Obviously, the uncontrolled copies have not been updated and remain in unknown hands. The document, when maintained and used in an appropriate manner by the appropriate personnel, has proven to be a useful tool. The opinion remains, however, that it would be inappropriate to issue the document to design engineering and Quality personnel as its use by them could prove counterproductive. The fact that Mr. Stokes is unaware of the document's actual present status is not surprising as there was no need to keep design engineers who did not receive the booklet abreast of the recall and reissue process.

330. Mr. Stokes also raises five specific points regarding details in the booklet in his possession. These points are addressed below:

1. Pages 1-10 and 1-11 contain general information concerning piping insulation, which is nonspecific in nature, presents commonly used practices, and identifies factors which can be considered in selection and application of insulation.

As to the reference to vapor barrier requirements, we do not understand the allegor's statement as all piping insulation is provided with a vapor barrier consisting of stainless steel or aluminum jacketing.

The reference to the use of double layers of insulation, with staggered joints for piping with operating temperatures above 600°F, is identified as a suggested design for best results, but it has extremely limited applicability to Diablo Canyon since very little piping operates in that temperature range.

The reference to safeguarding against mechanical damage to insulation during construction and maintenance can hardly be construed to apply to the very minor, localized crushing of calcium silicate insulation credited for resolving certain stress walkdown findings. The small number of cases identified where this occurs has been analyzed by Engineering and found to be acceptable. The

booklet accurately reflects the general policy in effect on this Project with the exceptions noted.

Identification of these items as technical concerns reflects a lack of understanding on the part of Mr. Stokes of acceptable insulation application practices.

2. Pages 1-13 and 1-14 are extracts from PTGC Project Instruction PI-20 which is in use at the Diablo Canyon Jobsite to control the removal of insulation which may be required to allow other construction work to proceed on the insulated piping or in its vicinity. The procedure was originated in, and is utilized by, the General Construction Department and Mr. Stokes' unfamiliarity with it is not surprising since he would not have needed to use it in his engineering assignment.
3. The concern raised regarding no dihedral angle limitations for skewed T-joint fillet welds was addressed in PGandE response dated March 6, 1984, to Joint Intervenors' Motion to Reopen on DQA, Breismeister, et al., Aff. at 51-52.
4. The concern raised regarding page 7-5 involving Attachment 1 to ESD 223 and throat deduction for inadequate weld penetration was addressed in PGandE response dated March 6, 1984, to Joint

Intervenors' Motion to Reopen on DQA, Breismeister, et al., Aff. at 53-54, as well as PGandE letter DCL-84-170 dated May 2, 1984, pages 5 and 6 and Attachment 1.

5. Pages 7-7 through 7-10 of the booklet contain basic welding symbols and their location significance provided in synopsis form which is taken from AWS standards. AWS symbols for welding have been used at Diablo Canyon since its inception and symbol usage has been incorporated into the Project by numerous references to contract specifications and other documents. This subject is discussed in further detail in PGandE letter DCL-84-166 dated April 30, 1984, pages 47 through 49.
  
331. This entire issue reflects Mr. Stokes' lack of knowledge about the subject. This allegation has no substance and no further action is required.

**INTER-OFFICE CORRESPONDENCE**

THE H. W. NELLOGG COMPANY

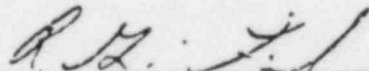
TO T. BELL

DATE DECEMBER 31, 1973

FROM R. G. FINK

SUBJECT MAINSTREAM AND FEEDWATER TO STEAM GENERATOR WELDS

Attached you will find an approved copy of Weld Procedure Code 200. This is a P1 to P12b weld procedure and is only to be used on pipe to nozzle welds, of the mainstream and feedwater system to the steam generator as noted on the drawings. Welders who are qualified to Weld Procedure Code 4/5 heavy wall shall also be qualified for Weld Procedure Code 200. Due to the critical nature of this weld we will audit the welders a minimum of once a day.

  
\_\_\_\_\_  
R. G. Fink  
Field Q.A./Q.C. Manager

Attachment

cc: J. W. Ryan  
R. Bell  
A. Conques  
M. Shore  
D. Ingram  
W. Guest  
R. Kincaide  
D. Tulko

RGF:cc

GUY F. ATKINSON COMPANY  
CONTRACTORS AND ENGINEERS  
DIABLO CANYON POWERPLANT  
POST OFFICE BOX 99  
AVILA BEACH, CALIFORNIA  
93424

March 22, 1978

Mr. M. Tresler  
Pacific Gas and Electric Company  
Post Office Box 117  
Avila Beach, CA 93424

Attention: Jim Cochran

Diablo Canyon Project - Specification 5422  
Review of Diaries

Q3-33

Gentlemen:

In reply to your letter of March 17, 1978 concerning review of personal diaries, we propose the following program.

Every three months starting April 1, 1978 the Quality Assurance Manager, Mike Walsh, will circulate to the keepers of diaries that may contain quality assurance matters, a form (copy enclosed) requesting that each person review his diary for the last three months and note on the form any unresolved Q.A. matters. After circulation to all diary keepers, this form will be reviewed by the Q.A. Manager for unresolved Q.A. matters and appropriate action taken.

We trust this program will meet your requirements.

Very truly yours,

GUY F. ATKINSON COMPANY

*R. W. Wunderlich*  
R.W. Wunderlich  
Project Manager

REVIEWED BY M.M. Walsh

RWW/dh

Enclosure

LOG AND DIARY AUDIT CHECKLIST

1. Name \_\_\_\_\_
2. Date of audit \_\_\_\_\_
3. Dates reviewed \_\_\_\_\_
4. Document description \_\_\_\_\_
5. List unresolved Quality Assurance related problems

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Audited by \_\_\_\_\_

6. Follow-up action required \_\_\_\_\_
- \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Quality Assurance Manager

\_\_\_\_\_  
Date

**GUY F. ATKINSON COMPANY**  
CONTRACTORS AND ENGINEERS

TR

ATTACHMENT 3, 2 of 3

INTER-OFFICE CORRESPONDENCE

June 4, 1979

FROM Tom Loomis, QA/QC Writer

TO All Quality Assurance Personnel

Pacific Gas and Electric Company requires Guy F. Atkinson Company Quality Assurance personnel to maintain logs, diaries or similar records, and review such logs for unresolved Quality Assurance problems. Attached is a "Log and Diary Audit Checklist" form for your use. Please review your diary or log for the period of September 1, 1978 to June 1, 1979, and list on the attached form any unresolved Quality Assurance problems. The form is to be returned to the Quality Assurance QA/QC Writer where it will be reviewed for unresolved problems and determined if any follow-up action is required.

This completed form should be returned no later than June 8, 1979.

Tom Loomis

Tom Loomis  
QA/QC Writer

TGL:sjg  
enclosure

REVIEWED BY:

M. M. Walsh  
M. M. Walsh



LOG AND DIARY AUDIT CHECKLIST

1. Name Don Hedrick
2. Date of audit 6-5-79
3. Dates reviewed SEPT. 1, 1978 TO JUNE 1, 1978
4. Document description DIARY
5. List unresolved Quality Assurance related problems  
NONE

Audited by Donald E Hedrick

6. Follow-up action required NONE

M. A. Anderson  
Quality Assurance Manager

7-10-79  
Date

# INDUSTRIAL PRODUCTS CORPORATION



ATTACHMENT 6

TOLL FREE 800-634-6861  
 3873 WEST GOVENDO + PHONE NEVADA 702 739 1966  
 LAS VEGAS NEVADA 89118

TO:

Pullman Power Products  
 P.O. Box 367  
 Avila Beach, CA 93424

## REPORT OF CHEMICAL AND PHYSICAL TEST

Q. Item	DESCRIPTION OF MATERIAL AND SPECIFICATIONS	CF-1
Letter	QUANTITY DESCRIPTION CUSTOMER ORDER NO OUR ORDER NO SPECIFICATION SHIPPING DATE	
A	32 3/4 - 10 X 3-1/4" Hex Bolts F7177-7523 CI 12970 ASTM A325 3-30-79	
B	32 7/8 - 9 X 5" Hex Bolts " " " "	
C	20 5/8 - 11 X 2-3/4" Bolts " " " "	

### CHEMICAL ANALYSIS

EM NO	GRADE	HEAT NO	C	Mn	P	S	Si	Ni	Cr	Mo	V
A		N53869	.39	.97	.013	.018	.23				
B		N35224	.34	.87	.005	.020	.25				
C		E51206	.47	.84	.024	.015	.20				

### MECHANICAL PROPERTIES

EM NO.	TENSILE STRENGTH	YIELD STRENGTH	PROOF LOAD	ELONGATION	PER CENT RED. AREA	HARDNESS		MINIMUM TEMPERING TEMP.
	PSI	PSI	LBS	PERCENT IN 2"		BHN	R/C	
A	150,000		28,400 Good				33	800°F
B	138,000		39,250 Good				28	800°F
C	133,700		19,200 Good				30/ 31	800°F

**APPROVED**  
 M. W. KELLOGG  
 S. A.  
*[Signature]*

I hereby certify that the foregoing data is a true copy of the data furnished us by the producing mill or the data from tests performed by Cardinal Foundry or Cardinal Industrial Products Corporation.

SWORN TO AND SUBSCRIBED BEFORE ME  
 this 30 day of April 1979  
*[Signature]*

*[Signature]*  
 AUTHORIZED AGENT

## ATTACHMENT 7

## Chemistry on Diablo Canyon A-325 Bolts

	SAMPLE			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
C	0.40	0.39	0.41	0.41
Mn	.72	.72	.73	.75
P	.015	.015	.015	.015
S	.010	.011	.011	.011
Cr	.03	.03	.03	.03
Ni	.01	.01	.01	.01
Mo (less than)	.005	.005	.005	.005
Cb (less than)	.005	.005	.005	.005
Ti (less than)	.005	.005	.005	.005
Cu	.02	.02	.02	.02
Al	.03	.03	.03	.03
B (less than)	.0005	.0005	.0005	.0005
Si	.17	.19	.19	.17
V (less than)	.005	.005	.005	.005
Zr (less than)	.005	.005	.005	.005

ATTACHMENT 8

HARDNESS OF WELDED A-325 BOLTS  
5/8 INCH DIAMETER X 2 INCHES LONG

LOCATION	SAMPLE				
	1		2	3	4
	HRC	HV	HRC	HRC	HRC
A-325 Base	30,30	No test	29,29.5	30,30.5	31,32
A-325 HAZ	20,8 22,10.5	251,227,230 258,279,228	20,17.5 21,23	23,14.5 15,11.5	25,24
Weld	4	178,142,198	10,9	5,16	No Test



**CORRESPONDENCE**

ATTACHMENT 10

File

DATE January 11, 1980

FROM D. R. Geske, Field QA/QC Manager

SUBJECT ASNT LEVEL II, M.T., JAMES McDERMOTT

On 10-22-79, Mr. James McDermott was certified ASNT Level II in Magnetic Particle Examination. This certification was limited to performing the examination and reporting all results to include photographs. This certification was based upon the following:

EDUCATION: B.A., Design and Industry, San Francisco State University, San Francisco, California, January, 1971. General Dynamics Programmed Instruction, Magnetic Particle Examination completed 8-17-79.

EXPERIENCE: Entered ASNT Level I training on 6-26-79 with written examination completed on 8-17-79. Accumulated 700 hours of practical Level I/II training between 6-26-79 and 10-19-79.

EXAMINATION: Satisfactory completion of ASNT Level II M.T. on 10-22-79. Tests consisted of General, Practical and Specific.

Mr. McDermott has been certified to perform magnetic particle examinations and to record the test results. He is continued in his interpretation training in that all test results are recorded with photographs subject to ASNT Level II interpretation and ASNT Level III review.

*Donald R. Geske*  
Donald R. Geske  
Field QA/QC Manager.

DRG:pam

INTEROFFICE CORRESPONDENCE

ATTACHMENT 11

TO File  
FROM D. R. Geske, Field QA/QC Manager  
SUBJECT ASNT LEVEL II, M.T., JOHN SALAS

DATE January 11, 1980

On 9-25-79, Mr. John Salas was certified ASNT Level II in Magnetic Particle Examination. This certification was limited to performing the examination and reporting all results to include photographs. This certification was based on the following:

EDUCATION: High School graduate, James Monroe High School, Sepulveda, California, June 1974. General Dynamics Programmed Instruction on Magnetic Particle Examination completed on 7-05-79.

EXPERIENCE: Entered ASNT Level I Training on 6-21-79 with written test completion on 7-05-79. Entered ASNT Level II training on 9-25-79.

EXAMINATION: Satisfactory completion of ASNT Level II M.T. on 9-25-79. Tests consisted of General, Specific and Practical examination.

Mr. Salas has been certified to perform magnetic particle examinations and to record the test results. He is continued in his interpretation training in that all test results are recorded with photographs subject to ASNT Level II interpretation and ASNT Level III review.

*Donald R. Geske*  
Donald R. Geske  
Field QA/QC Manager

DRG:pam

ATTACHMENT 12



Vogtle Nuclear Project  
Post Office Box 286  
Waynesboro Georgia 30830  
Telephone (404) 554-7716/7717

7-24-78

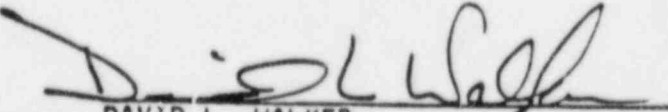
FROM: DAVID WALKER  
TO: PERSONNEL FILE OF Harold W. Karner  
SUBJECT: TRANSFER OF CERTIFICATION/RECERTIFICATION BY CONTINUING SATISFACTORY PERFORMANCE

Harold W. Karner was reassigned to Plant Vogtle from Plant Hatch with the Pullman Organization. After a review of certifications and upon the recommendation of his immediate supervisor, the below listed certifications were transferred to this site.

RECERTIFICATION BY CONTINUING SATISFACTORY PERFORMANCE

Harold W. Karner's qualifications were evaluated on the basis of past performance at Plant Hatch. A knowledge/understanding of procedures and application was demonstrated. Recertification was made as of this date on the following qualifications.

<u>DISCIPLINE</u>	<u>LEVEL</u>
Radiography	II
Ultrasonic	I
Magnetic Particle	II
Liquid Penetrant	II
Receiving	II
In-Process	II
Final	II
Welding	II
Visual	II

  
DAVID L. WALKER  
Q. A. - Q. C. MANAGER



## PLANT VOGTLE CERTIFICATIONS

 **Pullman Power Products**  
Division of Pullman Incorporated

**CERTIFICATION OF QUALIFICATION**

**Harold W. Karner**  
NAME

This is to certify that the above named person is employed by Pullman Power Products. He/She is qualified in accordance with Pullman Power Products Training and Qualification Procedures and is authorized to function as

**NDE Technician**  
TITLE


This Certificate is void upon termination with Pullman Power Products.

Social Security Number **311-36-4130**

The employee named herein is certified to function at the stipulated level in the following quality activities: (See Reverse)

**NONDESTRUCTIVE EXAMINATION**

NDE METHOD.	LEVEL	DATE CERTIFIED	BY	RECEPTION DUE DATE
RENDOGRAPHY	II	7-24-78	DW	7-24-81
ULTRASONIC	I	7-24-78	DW	7-24-81
MAGNETIC PARTICLE	II	7-24-78	DW	7-24-81
LIQUID PENETRANT	II	7-24-78	DW	7-24-81
LEAK TESTING				

  
LEVEL II



**Pullman Power Products**  
Division of Pullman Incorporated

**CERTIFICATION OF QUALIFICATION**

**HAROLD W. KARNER**

(NAME)

This is to certify that the above named person is employed by Pullman Power Products. He/She is qualified in accordance with Pullman Power Products Training and Qualification Procedures and is authorized to function as

**Q.C. SUPERVISOR - Q.A. ASST. MANAGER**

(TITLE)

This Certification is void upon termination with Pullman Power Products.

Social Security Number **311-36-4130**

The employee named herein is certified to function at the stipulated level in the following quality activities: (See Reverse)

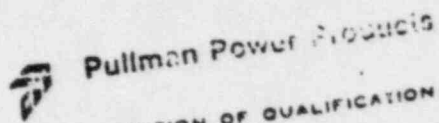
ATTACHMENT 14

NONDESTRUCTIVE EXAMINATION				
NDE METHOD	LEVEL	DATE CERTIFIED	BY	RECEPTION DUE DATE
RADIOGRAPHY	II	1-2-79	AK	11-2-82
ULTRASONIC				
MAGNETIC PARTICLE	II	1-2-79	AK	11-2-82
LIQUID PENETRANT	II	6-4-79	AK	5-4-82
LEAK TESTING				

CERTIFIED BY *[Signature]*  
LEVEL III

PLANT VOGTLE RECERTIFICATIONS BY RUNYAN

DIABLO CANYON CERTIFICATIONS



CERTIFICATION OF QUALIFICATION

**Harold W. Karner**

NAME

This is to certify that the above named person is employed by Pullman Power Products. He/She is qualified in accordance with Pullman Power Products Training and Qualification Procedures and is authorized to function as:

**QA/QC Manager**

(TITLE)

This Certification is void upon termination with Pullman Power Products

Social Security Number

**311-36-4130**

The employee named herein is certified to function at the stipulated level in the following quality activities. (See Reverse)

ATTACHMENT 15

NONDESTRUCTIVE EXAMINATION

NDE METHOD	LEVEL	DATE CERTIFIED	BY	RECERTIFICATION DUE DATE
RADIOGRAPHY	III	5/6/82	PT	5/6/85
ULTRASONIC				
MAGNETIC PARTICLE	III	5/6/82	PT	5/6/85
LIQUID PENETRANT	III	5/6/82	PT	5/6/85
LEAK TESTING				
VISUAL TESTING				

CERTIFIED BY:

*Donald A. Leake*

LEVEL III

INTEROFFICE CORRESPONDENCE

ATTACHMENT 16

DATE November 3, 1983  
TO H. W. Kerner  
FROM A. A. Eck  
SUBJECT Record of Corporate Audits Performed by Central Staff and of QEE  
at Diablo Canyon Project Beginning in 1972

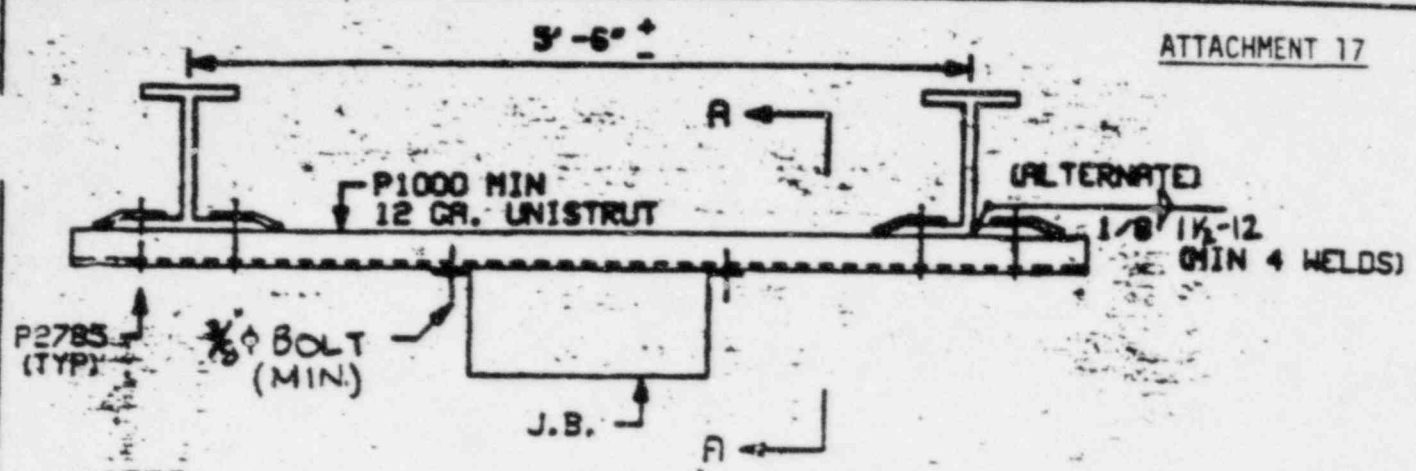
AUDIT NUMBER

DATE AUDITS PERFORMED

7177-1-79  
7177-1-80  
7177-1-81  
7177-1-82  
7177-1-83

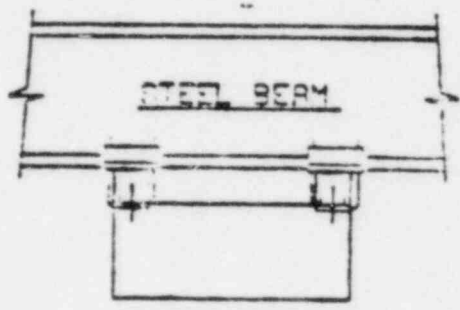
9/14/72  
10/31/73  
1/08/74  
4/09/74  
4/03/75  
7/29/75  
12/1/75  
8/10/76  
6/21/77  
2/14/78  
3/13/78  
4/17/79  
2/05/80  
1/12/81  
1/11/82  
1/10/83

AAE  
A. A. Eck



NOTES:

1. ALL CONNECTIONS WITH 1/2" Ø UNISTRUT NUTS AND BOLTS EXCEPT AS NOTED
2. MAX LOADING 10" x 36" x 10" 12 GA. ELECTRICAL BOX



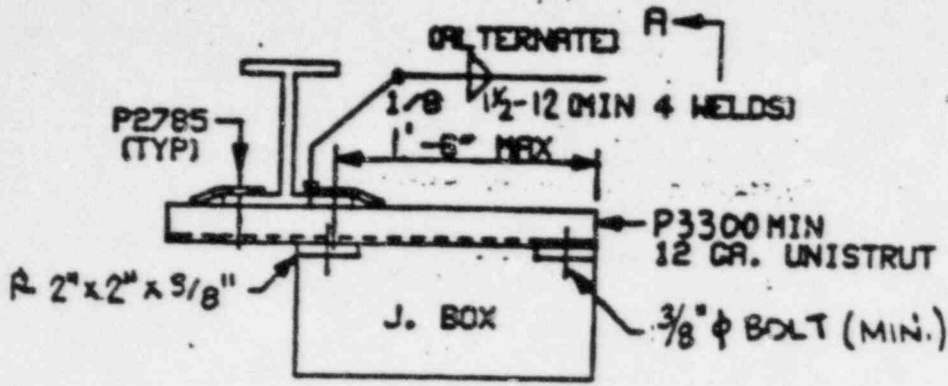
SECTION A-A

AREA	ELEVATION
F.G.	117'
FE/FW	117'

DETAIL S222

TYPICAL ARRANGEMENT OF ELECTRICAL BOX SUPPORT FROM STEEL BEAMS

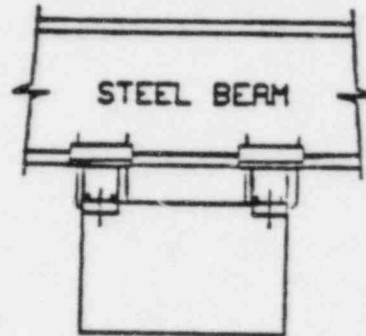
M/M NEG



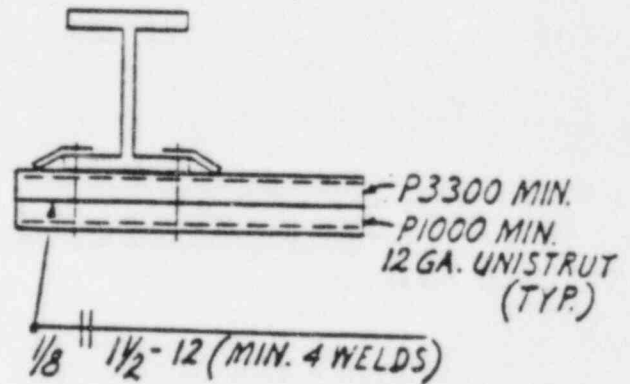
**NOTES:**

1. ALL CONNECTIONS WITH 1/2" Ø UNISTRUT NUTS AND BOLTS EXCEPT AS NOTED
2. MAX. LOADING 24" x 24" x 12" 12 GA. ELECTRICAL BOX

A ↙



SECTION A-A



ALT. MOUNTING

AREA	ELEVATION
D	104'
F	117', 165'
FE / FW	117'
G	117', 165'
GE / SW	140' E BELOW
A	85', 104', 119'

DETAIL



**TYPICAL ARRANGEMENT OF ELECTRICAL BOX SUPPORT FROM STEEL BEAMS**