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REGION V

J. O. SCHUYLER
VICE PRESIDENT
NUCLEAR POWER GENERATION

October 11, 1983

Mr. John B. Martin, Regional Administrator
U. S. Nuclear Regulatory Commission, Region V
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596-5368

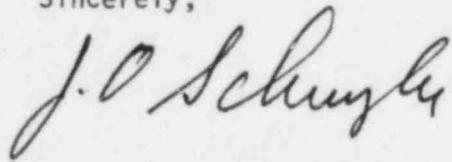
Re: Docket No. 50-275, QL-DPR-76
Diablo Canyon Unit 1
Final Response to Notice of Violation
NRC Inspection Report 83-08

Dear Mr. Martin:

On March 29, 1983, NRC Region V issued a Notice of Violation (Notice) regarding structural welds at Diablo Canyon. PG&E responded on April 25, 1983 to the Notice, and provided supplemental reports on May 19 and August 23, 1983.

PG&E's final response to the Notice is enclosed.

Sincerely,



Enclosure

cc: D. G. Eisenhut
Service List

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PDR ADOCK 05000275
Q PDR

On March 29, 1983, the NRC Region V issued a Notice of Violation, 50-275/83-08 (Notice), on Diablo Canyon Unit 1. The Notice cited certain weld deficiencies in the Unit 1 Fuel Handling Building. PGandE submitted responses to the Notice on April 25, May 19, and August 23, 1983. In those responses PGandE described and provided results of a weld reinspection program for various structures at the plant. In particular, PGandE reported on the results of one-hundred percent reinspections of structural steel fillet welds in the Unit 1 Fuel Handling Building (FHB) and Containment Structure, a sample reinspection of the Hot Shop, and a sample reinspection of the Unit 2 FHB. In addition, PGandE indicated that, based upon the results of the sample reinspections, a one-hundred percent reinspection would be conducted of the Hot Shop and Unit 2 FHB.

This report, which is PGandE's final response to the Notice, provides the results of PGandE's reinspection of the Hot Shop and Unit 2 FHB. As was done with the previous reinspection work, structural steel fillet weld reinspections were conducted in accordance with H. P. Foley Company (Foley) Procedure QCP-5A. This procedure is the same one used for the initial installation inspection and acceptance of the structural steel welds being reinspected. The criteria that were utilized for the reinspections have been previously described in our August 23, 1983 submittal. The results of the Hot Shop and Unit 2 FHB reinspections are summarized below:

- The results of the 100% Hot Shop structural steel fillet welds showed that, of the 2676 welds inspected, 390 welds did not meet criteria and were repaired. This is a repair rate of 14.5 percent.
- The results of the 100% reinspection of the Unit 2 FHB structural steel fillet welds showed that, of the 3169 welds inspected, 486 welds did not meet criteria and were repaired. This is a repair rate of 15%.

The majority of these weld rejections were minor deviations of a cosmetic nature which had no safety significance. Most could have been rated acceptable if typical industry inspection criteria were utilized rather than the more stringent Foley Procedure QCP-5A. With the completion of this segment of the reinspection program, the 100% reinspections of the Hot Shop, Unit 1 FHB, Unit 2 FHB, and the Unit 1 Containment platforms and annulus steel have now been completed.

As an integral part of this reinspection, PGandE has concluded that the cause of the weld deficiencies are as reported in our May 19, 1983 submittal; i.e., insufficient training of new welders and new welding inspectors, and an insufficient ratio of QC inspectors to production workers. Similarly, as described in our earlier responses to the Notice, PGandE has taken additional steps to improve Foley's quality program. These steps include providing greater management presence and involvement, additional training of inspectors, utilizing inspectors with a higher experience level, and increasing the ratio of inspectors to welders. These actions have

increased the effectiveness of the Foley quality program, as demonstrated in recent audits of the ongoing work.

In addition, as indicated in PGandE's August 23, 1983 submittal, other re-inspections were also performed of structural steel fillet welds previously accepted by Foley quality control inspectors who were not fully qualified in accordance with ANSI N45.2.6. In conducting this re-inspection effort, PGandE reviewed the qualifications of Foley weld inspectors employed between December 7, 1982 and April 15, 1983 to determine which inspectors were certifiable as Level I, Level II, and below Level I under ANSI 45.2.6. The inspection work of inspectors in the Level I category and below was identified and selected for review. A total of twenty-two inspectors were identified in this category. The documentation of all inspections performed during the above time period was reviewed and the inspections performed by each of these twenty-two individuals were identified.

These re-inspections of work inspected by these individuals were performed on a sampling basis. At least ten percent of the welds previously inspected by each of the 22 inspectors were examined. The inspection work of 18 of the 22 was accepted based on the sample results, which showed no weld rejections. The work of the four remaining inspectors failed to achieve an uniformly acceptable level of accuracy and the sample size of their work was either increased to a 100% re-inspection or accepted based on engineering evaluation of the rejected welds. Details of these four re-inspections, which involved welds on heating, ventilating, and air conditioning (HVAC) duct support systems, follow:

- The first HVAC inspector's sample was increased to 100%, following the initial 10% sample. Five-hundred eighty-eight welds were identified for reinspection. Of these, 566 were reinspected while 22 were inaccessible for reinspection. Of the 566 reinspected, 27 were rejected and repaired. The rejections were minimal in significance in that they were the result of oversized welds or minimally undersized welds. These results show an error rate of approximately 5%. Assuming that a similar 5% rejection ratio exists for the 22 inaccessible welds would result in one unacceptable weld in that group. Thus, these 22 welds are accepted based upon the probable population of one rejectable weld and the minimal significance of the rejections identified in those welds that were reinspected.
- The second HVAC inspector's sample was also increased to 100%, following the initial sample. Thirty-three welds were identified to be reinspected. Three of the 33 welds were rejected and one was inaccessible. The three rejections were due to minor undercut where the weld changed direction by 90 degrees. The three rejections were evaluated by the Diablo Canyon Engineering staff and were determined to have no effect on the structural integrity of the support. The inaccessible weld was accepted based upon the nature of the rejections of the reinspected welds.

- The third HVAC inspector had inspected 86 welds. Of these, ten were chosen for sampling. Three of the 86 were rejected. The rejections were due to existence of a fillet cap on a full penetration weld. This resulted in welds that exceeded design requirements but were otherwise structurally acceptable. Diablo Canyon Engineering evaluated this type of rejection and determined that it did not affect the structural integrity of the support. Accordingly, the remainder of the welds inspected by this inspector was accepted based on the sample results.
- The fourth HVAC inspector had inspected 86 welds. Thirteen of the 86 were sampled with one rejection. This rejection was due to minor undercut where the weld changed direction by 90 degrees. Diablo Canyon Engineering evaluated this rejection and determined that it did not affect the structural integrity of the support. Accordingly, the remainder of the welds were accepted based on the sample results.

To summarize, the specific corrective actions that have been taken in response to the Notice are:

1. Foley Procedure QCP-5A has been revised to clarify requirements of stamping welds by welders and inspectors.

2. Foley quality control inspectors, welders, and welders foremen, were given additional training to assure familiarity with weld inspection and procedural requirements.
3. All Foley inspectors, including those who did electrical raceway support and ventilation duct support and instrumentation, were reviewed for qualification. The work of those who were found not suitably qualified was sampled as described before.
4. For the Hot Shop, Unit 1 and Unit 2 FHB, and the Unit 1 containment, a 100% reinspection of structural steel fillet welds has been completed.
5. All weld rework conducted as a result of the reinspections has been completed. This rework consisted of adding filler metal to undersize welds, removing craters at weld ends, and removing slag and weld spatter.
6. The experience level of new quality control inspectors at Foley has been increased from the early 1983 level of 21 months to 86 months in April 1983. The current level of overall inspector experience is 73 months.
7. Foley has introduced additional management presence into its quality assurance/quality control organization to provide strong and experienced management.

We conclude that while the reinspection program has resulted in an average rejection of 13% on the reinspected welds, there were no serious breakdowns in the overall quality program and that no safety functions were jeopardized. This is due to the fact that the deviations from criteria were minor in nature. Indeed, most deviations could have been accepted if inspection criteria were not so strict. As we noted in our May 19, 1983 response, PGandE QA had also noted various discrepancies of a similar nature on the same time frame and was in the process of taking appropriate corrective action. Notwithstanding this fact, all deficient welds identified have been repaired and the reinspection program has been completed. This program, which is a response to our findings as well as Region V, has assured that the structural steel fillet welds are in conformance with commitments and requirements. The corrective actions taken as a result of these findings have been effective in eliminating any similar occurrence elsewhere in the plant.