U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.	50-275/87-05, 50-323/87-05
Docket Nos.	50-275, 50-323
License Nos.	DPR-80, DPR-82
Licensee:	Pacific Gas and Electric Company 77 Beale Street, Room 1451 San Francisco, California 94106
Facility Name:	Diablo Canyon Units 1 and 2
Inspection at:	Diablo Canyon Site, San Luis Obispo County, CA
Inspection Conducted:	January 12-16, 1987

Inspector: J. F. Burdoin, Reactor Inspection — Date Signed: 1/28/87

Approved by: M. M. Mendonca, Chief, Reactor Project Section I — Date Signed: 1/28/87

Summary:

Inspection during period of January 12-16, 1987 (Report Nos. 50-275/87-05 and 50-323/87-05

Areas Inspected: An unannounced inspection by one regional inspector of followup of NRC's Technical Audits Branch report on an allegation concerning a flat spot on the reactor coolant piping in Unit 1 containment; of the design changes, and modification; and an independent inspection of different vital areas and equipment in the plant. Inspection Procedure Nos. 30703, 37700, 71707, and 92701 were used as guidance for the inspection.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Individuals Contacted

Pacific Gas and Electric Company (PG&E)

*R. C. Thornberry, Plant Manager
*T. L. Grebel, Regulatory Compliance Supervisor
R. D. Etzler, Construction Superintendent
*D. A. Taggart, Director, Quality Support QA
L. F. Womack, Operations Manager
H. W. Karner, Rate Case Coordinator
R. M. McVicker, QC Inspector, Mechanical
D. R. Geske, Verification Planning Group Supervisor
D. A. Gonzalez, NDE Specialist
D. R. Bell, QC Supervisor, General Construction
M. E. Leppke, Project Engineer, General Construction
T. E. Pierce, General Construction QC Engineer
S. J. Foat, Power Production Engineer
A. W. Novak, Mechanical Engineer
Various other engineering and QC personnel

*Denotes attendees at exit management meeting on January 16, 1987.

In addition, NRC Resident Inspectors attended the exit management meeting.

2. Area Inspection

An independent inspection was conducted in the Turbine and Auxiliary Buildings. The equipment spaces inspected included:

a. Five Emergency Diesel Generator Rooms, Units 1 and 2.

b. Six 4160 Volt Switchgear Rooms, Units 1 and 2.

c. Six Battery Rooms, Units 1 and 2.

d. Six 480 Volt Vital Bus Rooms, Units 1 and 2.

e. Two Cable Spreading Rooms, Units 1 and 2.

f. Two Hot Shutdown Panel Areas, Units 1 and 2.

g. Turbine Building, Elevations 85' and 140', Units 1 and 2.

h. Two 480 Volt Load Center Areas, Units 1 and 2.

i. Combined Two-Unit Control Room, Units 1 and 2.

Housekeeping and equipment status appeared to be acceptable.

No violations of NRC requirements were identified.

3. (Closed) 50-275/BD-04-01, Followup on Handling of Flat Spot on a Large 36 Inch Diameter Pipe (Closed Allegation Nos. 55, 161, and 221).

The Technical Audits Branch in their memorandum of August 16, 1985 brought to Region V's attention that an alleger contends he had made an allegation to Region V personnel that had not been resolved by the NRC. The alleger had identified a flat spot on a large pipe about 36 inches in diameter with a wall thickness of 2.15 inches in Unit 1 containment and his concern was pipe wall thickness. He assumed the pipe would have a thinner wall dimension in the area of the flat spot. The alleger further contends that the licensee's response to the NRC on this issued referred to a flat spot on a 10 inch pipe with a wall thickness of 1 inch, and his concern of the flat spot on the 36 inch diameter was not addressed. It is the objective of this report to address the concern of a flat spot on the 36 inch diameter pipe.

The original source document was reviewed and it was determined that part of the alleger's complaint was of a welding flaw on a 10 inch pipe off the cold leg pipe from reactor coolant pump 1-2. The source document also reveals that the alleger identified a flat spot on a 36 inch diameter pipe in the area (adjacent to and within approximately six feet) of the 10 inch pipe. The only 36 inch diameter pipe in this area, is the reactor coolant system crossover pipe from steam generator 1-2 to the suction of reactor coolant (RC) pump 1-2. It is assumed that the flat spot the alleger was referring to is on the crossover pipe section to RC pump 1-2.

During the design re-verification program for Unit 1, the Stone and Webster Engineering firm made an independent audit of the Reactor Coolant System (RCS) at the Diablo Canyon plant. This independent review involved a detailed visual examination of the Reactor Coolant System piping. All four loops of the primary system were inspected. A team of 3 to 4 auditors required a period of approximately two months from early September 1982 until the middle of November 1982 to complete their hand-over-hand inspection of RCS piping surfaces. This type of an inspection involves visual examination of every square inch of the pipe surface for deficiencies. All pipe surface deficiency such as gouges, grinding marks, file scratches, arc strikes, weld splatter, rust, etc., were identified and documented. Following the inspection, the list of deficiencies was turned over to the licensee who prepared minor variation reports (MVR) M-4405, M-4415 and M-4420 to correct/repair the deficiencies found by the Stone and Webster auditors. The repairs of the deficiencies were made by the Pullman Powers Products Company, the mechanical contractor on the site. The contractor's quality control group followed the repair work and signed for the final inspection of the repairs. The licensee mechanical field engineers performed an independent visual verification of the completed repairs of the deficiencies. Following the completion of the repairs of the deficiencies, the RCS pipe was washed with demineralized water and swab tested to determine the chlorine/fluoride content before the installation of the reflective insulation. Both of these processes; washing of the pipe and installing the insulation were followed and documented by general construction quality control inspectors.

Stone and Webster's audit of the Reactor Coolant System identified several areas where handling lugs and fitup clips had been removed by grinding but had not been liquid penetrant inspected. MVR-4405 was prepared to require all such areas where removal by grinding had been accomplished be examined with liquid penetrant. Any rejectable indications were to be removed and/or repaired in accordance with approved procedures which required ultrasonic measurement of pipe wall thickness. A number of such grinding removal areas were found on RC loop 1-2. The inspector examined in detail MVR-4405 and the associated completion certifications and documentation. These records and documents appeared to be in order.

Stone and Webster examination of the crossover leg of reactor coolant system loop 1-2 also identif' five deficiencies. Three rust areas, one cavity (5/16" x 3/16" x 1/16" deep) on welded attachment removal area, and adjacent gouges (two) approximate four inches in length. These deficiencies were corrected under MVR 4415. The repair measures for the rust areas included, remove by wire brushing with a stainless steel brush and clean as necessary using demineralized water or acetone. The documentation for the repairs of the cavity and gouges discrepancies indicates the areas were tapered and blend by grinding, the removal areas were tested with liquid penetrant and were ultrasonically tested to determine the wall thickness.

The inspector examined in detail MVR 4415 and 4420, and the associated repair completion certifications and documentation. The inspector also examined the documentation certifying the washing of the pipe and the installation of the reflective insulation. These records and documentation appeared to be in order and acceptable.

The Stone and Webster audit of loop 2 crossover pipe did not identify any flat spots as discrepancies. A discussion with the licensee's engineer who coordinated the Stone and Webster audit of the RC system piping stated that any flat spots discovered by these auditors would have been documented by these auditors as discrepancies.

Following the completion of installation of the reflective insulation and in the spring of 1983, it was necessary to remove some of the insulation to make pipe girth weld baseline thickness measurements. It was in this time frame that LER 83-004 which identified four gouges made with grinding wheel or rotary file on RCS piping loop 1-3 was filed with NRC. It was concluded that these gouges were intentionally caused by persons unknown. This issue was addressed in Inspection Reports 83-17/83-20/83-21/84-13.

To ensure there was no additional damage to the reactor coolant piping, Quality Control Inspection Plan (QCI) 83-414 date June 30, 1983 was developed to require a 100 percent inspection of the piping surfaces for those portions of the Unit 1 Reactor Coolant System were reflective insulation had been removed to facilitate making pipe girth weld baseline thickness measurements. However, it was decided to remove all of the reflective insulation from the primary system piping and perform a hand-over-hand visual inspection of 100% of the Reactor Coolant System piping surface. This work was done during the summer of 1983. This

inspection of the piping surfaces for damage also identified and documented any deficiencies such as weld splatter, arc strikes, gouges, rust spots, paint residue, etc. This QCI also required correction of all deficiencies found, and cleaning of pipes surface with demineralized water or acetone prior to the reinstallation of the reflective insulation. The inspector examined in detail the QCI 83-414 and associated documentation for the accomplishment and completion of the above described work. This documentation appeared to be in order and acceptable.

The hand-over-hand inspection of loop 1-2 crossover pipe identified three deficiencies; tightly adhering weld splatter on inside radius below weld WIB-RC-2-/4 on the 90 degree elbow, tightly adhering weld splatter on the 20 degree elbow above weld WIB-RC-2-B, and pipe support/restraint clamps on both elbows were not removed for final cleaning. The inspector examined nuclear plant problem report (NPRR)'s DC1-83-QC-PO 257, 258, 259, 266, and 298 for correcting these deficiencies. The corrective measures appeared to be acceptable and the documentation appeared to be in order. It is noted that this hand-over-hand inspection of the loop 1-2 crossover pipe also did not identify a flat spot on this portion of the RC piping. A discussion with the licensee's QC inspector that supervised this hand-over-hand inspection of the RC piping in the field stated that any flat spots found during inspection would have been documented as discrepancies.

The license to ensure no damage was done to the reactor coolant system piping surface following the correction on any deficiencies and immediately prior to reinstallation of the reflective insulation required: A visual examination of all exposed surfaces of the pipe for visible evidence of damaged and maintained a surveillance of visually accepted exposed piping until the reflective insulation was reinstalled on the pipe. To maintain visual surveillance of the exposed pipe the licensee utilized the Plant Security Force by placing guards on the pipe until the insulation was reinstalled.

The reflective insulation once installed under QCI 83-414 was not removed again prior to plant initial startup (April 1984) except in a few isolated cases such as the followup of allegations. In those cases, a minimum amount of insulation was removed and extreme care was exercised to ensure no damage was done to the RCS piping during the short period that the reflective insulation was off the pipe.

The inspector examined the certification and documentation for the washing of the reactor coolant piping, and the reinstallation of the reflective insulation following the repair of the deficiencies identified during the inspection required by QCI 83-414. These records appeared to be in order and acceptable.

Summary

Two complete and independent hand-over-hand (meticulous) inspections of the reactor coolant piping surfaces were performed between the fall of 1982 and end of summer of 1983. From review of the deficiencies found and repaired during the two inspections, the first inspection (Stone and

Webster inspection) brought out the more significant deficiencies such as gouges, cavities, file scratches, arc strikes, and grinding marks while the second inspection (QCI 83-414 inspection) found mostly less significant deficiencies such as arc strikes, weld splatter, paint residue, etc. These deficiencies found by the second inspection are all items which probably occurred between the time the first inspection was completed and the second inspection was performed.

It is concluded that both inspections of the pipe surfaces were very thorough. Neither inspection identified a flat spot on the surfaces of loop 1-2 of the primary system piping. Had such a spot been identified anywhere on the Reactor Coolant System piping, it would have been ultrasonically tested to determine pipe wall thickness. It is possible that the alleger identified as a flat spot, one of the handling lug removal grinding areas which were addressed earlier in this report. In the final analysis, the licensee's processing of piping surfaces of the reactor coolant piping during late 1982 and 1983 in preparation for declaring the system operational is considered to be thorough and acceptable. This item is closed.

No violations or deviations were identified.

4. Design, Design Changes, and Modifications

The review and examination of licensee's procedures for processing onsite design, design changes, and modifications was commenced by reviewing Engineering Procedure No. 3.60N, Revision TR-59, dated August 4, 1986, "Operating Nuclear Power Plant Design Changes." However, inspection in this area was incomplete and shall be continued during a future inspection.

This item will be followed as open item 50-275/323/87-05-01.

No violations or deviations were identified.

5. Exit Meeting

The inspector conducted an exit meeting on January 16, 1987, with the Plant Manager and other members of the plant staff. During this meeting, the inspector summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the concerns identified in the report.