PACIFIC GAS AND ELECTRIC COMPANY

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JAMES D. SHIFFER
VICE PRESIDENT
NUCLEAR POWER GENERATION

March 10, 1986

PGandE Letter No.: DCL-86-062

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, OL-DPR-80
Docket No. 50-323, OL-DPR-81
Diablo Canyon Units 1 and 2
Revised Response to Allegation #1544 - Silver Brazing

Dear Mr. Martin:

On February 22, 1985, PGandE letter DCL-85-077 provided information on Allegation #1544, regarding silver-brazed fittings. The information was provided in response to a NRC letter dated January 17, 1985, which forwarded a set of allegations to PGandE for evaluation, investigation, and response. Additional information regarding silver-brazed fittings on capillary systems has been obtained since the submittal of DCL-85-077. PGandE has evaluated this information and has determined that it has no safety significance. An updated response to Allegation #1544 is provided in the enclosure.

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

Sincerely,

Enclosure

cc: L. J. Chandler
R. T. Dodds
B. Norton
H. E. Schierling
S. A. Varga
CPUC
Diablo Distribution

0470S/0042K/RWR/1586

1/1 IE01

ENCLOSURE

NRC Allegation #1544

Allegation Description:

Stainless pipe fittings, silver braised [sic], on the Unit 1 boric acid tanks, leaked and were not repaired. This was reported to the Hotline.

The Quality Hotline report referred to in the allegation was made on August 9, 1984. The report alleged that several weld joints on 1/4-inch stainless steel tubing on the boric acid system were brazed and not welded in accordance with applicable procedures. An investigation (Quality Concern Summary Report 074) of the allegation determined that there were no silver-brazed stainless steel fittings on the Unit 1 boric acid tanks. Furthermore, none of the existing boric acid tank fittings have ever leaked or required repair due to silver-brazed fittings. A walkdown which was conducted as part of this investigation discovered three silver-brazed capillary fittings on the gas decay tank system. A Nuclear Plant Problem Report (NPPR) was initiated on October 5, 1984, and the fittings were replaced and welded in accordance with appropriate procedures.

The investigation further revealed, however, that in April 1984, a NPPR had been written concerning the discovery of a defective level indicator capillary fitting on the liquid holdup tank. Some months later in August 1984, a NPPR was initiated on a volume control tank level indicator which also had a silver-brazed capillary fitting and required rework. The above fittings were replaced and welded in accordance with applicable procedures. The investigation concluded that the installation of silver-brazed fittings had been performed by plant personnel during capillary maintenance activities.

The use of silver brazing on capillary-filled systems by PGandE plant personnel was based upon an engineering evaluation dated April 25, 1979. This evaluation determined that silver brazing was acceptable on capillary tubing runs between the bellows sensors and the pressure and/or differential pressure instruments. The only requirement was that all of the brazing be performed in accordance with ASME Boiler and Pressure Vessel Code, Section IX, and that the welders be qualified in accordance with that code. The evaluation also

cautioned that brazing be avoided in the following circumstances: (1) when boric acid might be present in the area, and (2) in areas subject to (neutron) irradiation (i.e., for ALARA purposes). Although this engineering evaluation permitted silver brazing on filled, stainless steel capillary systems, procedures had not been developed until recently to guide the silver brazing process.

As a result of Allegation #1544, the plant staff personnel, in February 1985, conducted an investigation and walkdown of Unit 1 and common equipment capillary systems within the auxiliary building. One additional instance of silver brazing on a capillary system (LT-315) was discovered in the Unit 1 auxiliary building. This finding was tracked on a NPPR and the fitting was replaced and welded in accordance with applicable procedures. Following the February 1985 investigation, a partial walkdown of the Unit 1 containment was conducted. This partial walkdown of the containment was considered appropriate after discussions with plant staff personnel indicated that capillary maintenance had not been performed in the Unit 1 containment. No silver-brazed fittings were found during the partial walkdown of the capillary systems inside containment. At the time of the Unit 1 (and common equipment) walkdown (February 1985), it was determined that a Unit 2 walkdown of the capillary systems was not necessary since plant staff personnel had not yet assumed Unit 2 maintenance responsibilities, and presumably no silver brazing had been conducted.

Some months later in June 1985, General Construction (GC) personnel, while conducting a Unit 2 system walkdown in preparation for a plant design change (unrelated to the silver brazing of stainless steel capillary systems), noted the use of a silver-brazed fitting in a stainless steel capillary system in the Unit 2 portion of the auxiliary building. As a result of this finding, an investigation was conducted in mid-July 1985 during which nine additional instances of silver brazing were identified in the common equipment and the Unit 2 portion of the auxiliary building and one additional instance in the Unit 1 portion of the auxiliary building.

Based on these additional instances of the use of silver-brazed fittings on capillary systems, a nonconformance report was initiated in late July 1985 and the following corrective actions, which included a fitting changeout program, were taken:

- An inspection team, including a person qualified in welding techniques, conducted a 100 percent walkdown of Unit 2 containment and auxiliary building capillary systems. The walkdown discovered four additional Design Class II instruments where silver-brazed fittings were used in the liquid radwaste systems. These fittings have been replaced as part of the silver-brazed fitting changeout program.

- A Unit 1 walkdown has been completed except for the volume control tank area and the containment, which are currently inaccessible due to ALARA considerations. The volume control tank area and the containment will be walked down during the first refueling outage. These planned walkdown activities have been entered into the plant tracking system to ensure completion. The walkdown results will be evaluated and any needed repairs will be made as plant conditions permit.

- The Unit 1, Unit 2, and common area equipment silver-brazed fittings have been replaced and welded in accordance with appropriate procedures.

Separate and apart from the fitting changeout program, PGandE has issued qualified procedures for the silver brazing and welding of stainless steel fittings and imposed additional controls for future use of these processes in maintenance and installation activities. For maintenance activities, plant personnel will use the Plant Maintenance Shopwork Follower Procedure. For installation and/or repair activities, GC will use its construction work package development and control instruction. This will ensure compliance with the special process procedures and applicable codes.

A safety evaluation was conducted for the single instance where a silver-brazed fitting was found on a Design Class IB capillary system. The

evaluation included a destructive examination which determined that there were no adverse safety concerns since the ultimate strength of the silver-brazed joint would exceed that of the stainless steel tubing connecting the bellows assembly and the transmitter.

Design Class 1B (Regulatory Guide 1.97, Category 3) requires that the device be high-quality, commercial grade selected to withstand the service environment in which it is located. The silver-brazed capillary fitting is separated from the process fluid by a bellows/diaphragm. The silver brazing was performed on the capillary side of the connection which is not part of the pressure boundary, and the silver brazing flux could not come in contact with the process fluid. It was, therefore, concluded that no loss of system integrity or the introduction of fluoride into the reactor coolant system could occur and, accordingly, there were no safety concerns associated with the installation of fittings in capillary systems using the silver brazing process.

In PGandE's February 22, 1985 submittal (DCL-85-077) on this matter, it was stated that all of the findings of silver brazing on capillary systems in Unit 1 were on Design Class 2 systems. Subsequent to that submittal, the Unit 1 volume control tank level instrument, LT-112, was upgraded (April 19, 1985) to Design Class 1B (see attachment). The conclusions from the destructive examination discussed above for PT-153 apply equally to LT-112.

The attachment identifies the instrument, system, and safety class for the above instances in which silver brazing was reported.

Attachment

Attachment

The following instruments have bellows/capillary systems and are sealed from the process fluid by the bellows. The silver brazing was performed on the capillary side of the bellows/capillary connection.

Instrument No.	Description	Design Class
Unit 1		
PT-66(5)	Vent Header (Waste Gas)	II
LT-315(4)	Boric Acid Evaporator	II
LI-167(1)	Liquid Holdup Tank 0-1	II
LI-230(3)	Gas Decay Tank 1-1	II
LI-231(3)	Gas Decay Tank 1-2	II
LI-232(3)	Gas Decay Tank 1-3	II
LT-112(2)	Volume Control Tank	1B(6)
Unit 2		
PT-153(5)	Gas Decay Tank 2-2	1B
PT-66(5)	Vent Header (Waste Gas)	II
PT-67(5)	Decay Tank 2-3 Inlet	II
PT-68(5)	Decay Tank 2-2 Inlet	II
PT-69(5)	Decay Tank 2-1 Inlet	II
LT-232(5)	Gas Decay Tank 2-3	II
Common		
LT-125(5)	Equipment Drain Receiver 0-2	II
LT-126(5)	Floor Drain Receiver 0-1	II
LT-127(5)	Floor Drain Receiver 0-2	II
LT-129(5)	Waste Evaporator Condensate Tank 0-2	II
PT-40(5)	Waste Filter 0-1 D/P	II
PT-42(5)	Waste Filter 0-3 D/P	II
FT-141(5)	Waste Filter 0-2 D/P	II
FT-241(5)	Laundry Pump Discharge	II

Attachment

(1) Identified April 1984 (NPPR DCO-84-OP-P0833)*

(2) Identified August 1984 (NPPR DC1-84-OP-P1567)*

(3) Identified October 1984 (NPPR DC1-84-QC-P0599)*

(4) Identified during the February 1985 Unit 1 containment and auxiliary building walkdown program for capillary systems

(5) Identified during the July 1985 investigation, and evaluation and walkdown program.

(6) Upgraded to Class 1B on April 19, 1985 (DCN DC-1-EJ-27386R2); was previously classified as Design Class II in August 1984.

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* Silver-brazed fitting replaced and welded in accordance with appropriate procedures.