



Southern California Edison Company

P. O. BOX 128

SAN CLEMENTE, CALIFORNIA 92674-0128

November 29, 1995

WALTER C. MARSH
MANAGER OF NUCLEAR REGULATORY AFFAIRS

TELEPHONE
(714) 368-7501

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
Additional Information - Generic Letter 95-03, "Circumferential
Cracking of Steam Generator Tubes" (TAC Nos. M92271 and M92272)
San Onofre Nuclear Generating Station
Units 2 and 3

- References:
1. Letter from Mel B. Fields (NRC) to Harold B. Ray (Southern California Edison Company), dated October 23, 1995, Request for Additional Information - Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes" (TAC Nos. M92271 and M92272)
 2. Letter from Walter C. Marsh to Document Control Desk, dated June 27, 1995, Response to NRC Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes," San Onofre Nuclear Generating Station Units 2 and 3

This letter provides the additional information requested by the NRC in Reference 1 concerning Southern California Edison's (Edison's) response (Reference 2) to Generic Letter (GL) 95-03 "Circumferential Cracking of Steam Generator Tubes."

The Enclosure provides the detailed information. In summary,

- There has been no occurrence of circumferential cracking in the small-radius U-bends of any Combustion Engineering supplied steam generator.
- Denting has not been experienced at support locations in the San Onofre Units 2 and 3 steam generators.
- Edison currently plans to use a rotating probe with a plus-point coil and a 0.115-inch pancake coil to inspect 100% of the Unit 2 tubes for circumferential stress corrosion cracking at the hot-leg top of tubesheet during the next (Cycle 9) refueling outage. Plans include the use of terrain plots in data analysis. We will inform you should these plans change.

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- Terrain plots were routinely used in previous inspections to analyze eddy current data at locations susceptible to circumferential cracking.

The Justification for Continued Operation that was provided in the Edison response to GL 95-03 remains unchanged with the additional information provided.

If you have any questions or would like additional information, please let me know.

Sincerely,

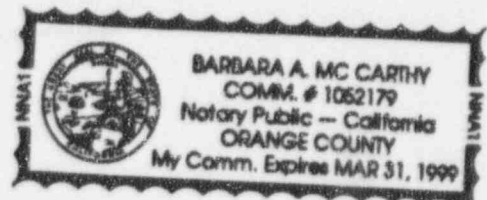
Walter C. Marsh

State of California
County of San Diego

On 11/29/95 before me, BARBARA A. MCCARTHY / ^{NOTARY PUBLIC}, personally appeared WALTER C. MARSH, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature *Barbara A. McCarthy*



Enclosure

- cc: L. J. Callan, Regional Administrator, NRC Region IV
 J. E. Dyer, Director, Division of Reactor Projects, Region IV
 K. E. Perkins, Jr., Director, Walnut Creek Field Office, NRC Region IV
 J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3
 M. B. Fields, NRC Project Manager, San Onofre Units 2 and 3

ENCLOSURE

ADDITIONAL INFORMATION, GENERIC LETTER 95-03

SAN ONOFRE UNITS 2 AND 3

ADDITIONAL INFORMATION, GENERIC LETTER 95-03
San Onofre Units 2 and 3

This Enclosure provides the response to the NRC Request for Additional Information (RAI) received by Southern California Edison (Edison) on October 30, 1995. The RAI requested additional information and/or clarification to Edison's response, dated June 27, 1995, to Generic Letter (GL) 95-03 "Circumferential Cracking of Steam Generator Tubes" dated April 28, 1995.

RAI Item 1:

In your response, areas b [Small radius U-bend circumferential cracking] and c [Dented location (including dented TSP) circumferential cracking] were not specifically addressed for both units although it was indicated that the next steam generator tube inspections will be performed in accordance with the recommendations of the Electric Power Research Institute steam generator inspection guidelines. In addition, future inspection plans for area a [Expansion transition circumferential cracking] were not provided for Unit 2.

Edison Response:

Small Radius U-bend Circumferential Cracking

To date, there has been no occurrence of circumferential cracking in the small-radius (rows 1 and 2) U-bends of any Combustion Engineering supplied steam generator. The Electric Power Research Institute's "PWR Steam Generator Examination Guidelines," which includes consideration of related industry experience, will provide guidance for inspection of this area.

Dented Location Circumferential Cracking

Denting has not been experienced at support locations in the San Onofre Units 2 and 3 steam generators. These steam generators do not have tube support plates (TSP). Lattice bar assemblies (commonly referred to as "eggcrates") provide similar support to tubing in these steam generators. A state-of-the-art chemistry program and full-flow condensate polishing demineralizer systems have contributed to this experience.

Denting has been experienced at the top of the tubesheet in a very limited area of the Units 2 and 3 steam generators. This area has a maximum number of 56 tubes in each steam generator and is adjacent to the "tie rods."

A tie rod is a carbon steel rod with a diameter similar to the tubing. Each steam generator has several tie rods at various locations in lieu of tubing. These tie rods were a manufacturing aid used to maintain the lattice bar support structure alignment prior to completion of tube installation. It is postulated that corrosion of the tie rods at the top of tubesheet, similar to the corrosion of support plates in other steam generators, results in tie rod expansion. It

is further postulated that the tie rod expansion is transmitted to adjacent tubes, resulting in the potential for denting of adjacent tubes.

No circumferential cracking has been detected at any of the dented locations. All tubes adjacent to tie rods (both dented and undented) have been tested with the rotating pancake coil probe for circumferential cracking at the hot-leg top of tubesheet. Terrain plots were used to analyze this data. The inspection plans for expansion transition circumferential cracking for Units 2 and 3, that are addressed in the Edison June 27, 1995 response to Generic Letter 95-03 and this letter, also apply to tubes adjacent to tie rods. These plans will provide for inspection of all tubes adjacent to tie rods (both dented and undented) using a rotating probe with a plus-point coil and a 0.115-inch pancake coil, and using terrain plots in analysis of the data.

**Future Inspection Plans for San Onofre Unit 2
(Area a. - Expansion transition circumferential cracking)**

Edison plans to use a rotating probe with a plus-point coil and a 0.115-inch pancake coil to inspect 100% of the Unit 2 tubes for circumferential stress corrosion cracking at the hot-leg top of tubesheet location during the next refueling outage (Cycle 9). Notably, this plan is the same as the plan for Unit 3 that was discussed in the Edison June 27, 1995 response to Generic Letter 95-03, and then used during the Unit 3 Cycle 8 refueling outage.

RAI Item 2:

... For the rotating pancake coil (RPC) examinations performed at your plant at locations susceptible to circumferential cracking during the previous inspection (i.e., previous inspection per your Generic Letter 95-03 response), discuss the extent to which terrain plots were used to analyze the eddy current data. If terrain plots were not routinely used at locations susceptible to circumferential cracking, discuss whether or not the RPC eddy current data has been reanalyzed using terrain mapping of the data. If terrain plots were not routinely used during the outage and your data has not been reanalyzed with terrain mapping of the data, discuss your basis for not reanalyzing your previous RPC data in light of the findings at Maine Yankee.

Discuss whether terrain plots will be used to analyze the RPC eddy current data at locations susceptible to circumferential cracking during your next steam generator tube inspection (i.e., the next inspection per your Generic Letter 95-03 response).

Edison Response:

Terrain plots were routinely used during the previous inspections (i.e., previous inspections as stated in the Edison Generic Letter 95-03 response) to analyze eddy current data at locations susceptible to circumferential cracking. Thus, reanalysis of data is not applicable. Terrain plots were also routinely used during the Unit 3 Cycle 8 refueling outage (post-GL 95-03). Plans for the Unit 2 Cycle 9 inspection include use of terrain plots.

In summary, the Justification for Continued Operation that was provided in the June 27, 1995 Edison response to Generic Letter 95-03 remains unchanged with the additional information provided above.