February 12, 1990

Docket No. 50-304

Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
1400 OPUS Place
Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: ZION UNIT 2 - REQUEST FOR ADDITIONAL INFORMATION ON DEGRADED TUBE R1C55 IN STEAM GENERATOR A (TAC NO. 72728)

By letter dated March 2, 1989, Commonwealth Edison Company submitted a detailed assessment of degraded tube R1C55 in Steam Generator A of Zion Unit 2. This assessment was requested by the staff to ensure that this tube, which is plugged due to a circumferential crack, will not cause damage to adjacent tubes. We have reviewed your submittal and determined that additional information, as identified in the enclosure, is needed before we can complete our evaluation. Please provide this information within 30 days from the date of this letter.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Original signed by

Chandu P. Patel, Project Manager
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 12, 1990

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Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
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Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: ZION UNIT 2 - REQUEST FOR ADDITIONAL INFORMATION ON DEGRADED TUBE R1C55 IN STEAM GENERATOR A (TAC NO. 72728)

By letter dated March 2, 1989, Commonwealth Edison Company submitted a detailed assessment of degraded tube R1C55 in Steam Generator A of Zion Unit 2. This assessment was requested by the staff to ensure that this tube, which is plugged due to a circumferential crack, will not cause damage to adjacent tubes. We have reviewed your submittal and determined that additional information, as identified in the enclosure, is needed before we can complete our evaluation. Please provide this information within 30 days from the date of this letter.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

Chandu P. Patel

Chandu P. Patel, Project Manager
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: See next page

Mr. Thomas J. Kovach
Commonwealth Edison Company

Zion Nuclear Power Station
Units 1 and 2

cc:

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

COMMONWEALTH EDISON COMPANY

ZION UNIT 2

DEGRADED TUBE R1C55 IN STEAM GENERATOR A

Reference: Commonwealth Edison letter dated March 2, 1989, to Director of Nuclear Reactor Regulation, NRC, with enclosed Westinghouse Report WCAP-12175.

1. Section 5.2 of WCAP-12175 briefly describes the qualification of the analytical turbulence excitation model using a prototypical two-phase test. Please describe how FASTVIB (see Section 6.1) was qualified to calculate fluid-elastic stability ratios for prototypical two-phase conditions. What is the expected accuracy (in terms of +/- "x" percent) of the turbulent response model and the FASTVIB model for prototypical conditions?

2. Provide an assessment of the uncertainty associated with the stability ratio results in Table 6-1 which is introduced by uncertainties in the assumed damping coefficient and stability constant and by the uncertainties in the ATHOS flow velocity, density, and void fraction distribution results.

3. Considering the scenario of a severed tube discussed in Section 6.4, confirm that the Westinghouse model considered the u-bend segment extending from the severed location to the top support on the hot leg side (rather than simply the shorter u-bend segment extending from the severed location to the top support on the cold leg side).

4. The staff notes that, dependent on the actual crossflow velocity distribution, a tube may initially undergo instability in a mode other than the lowest frequency mode. Has Westinghouse calculated the modal effective velocity (MEVEL) and associated stability ratio for several of the lowest modes, or only the lowest mode? Do the results given in Table 6-1 correspond to the lowest mode?

5. Clarification of note (3) of Table 6-1 is requested. For example, when the authors state "Actual U-bend values would be lower than the values listed for this case", are they referring to all the values or only the values for stability ratio and turbulent displacement?

6. "The linearly supported tube" (p. 35) was used for the fluidelastic instability analysis, while "nonlinear, finite element, dynamic methods" (p. 37) were used for the turbulence response of U-bends. Why were two different models used?

7. On page 38, the equation for the response to turbulence excitation is independent of damping. Is the effect of damping included in the parameter C_1?

8. There are errors in Eq. (1) [β is missing in the numerator of the right-hand-side], Eq. (2) [the slash (/) symbol in the denominator of the right-hand-side should be deleted], and the equation on page 38 [should be subscript o on ρ rather than superscript o; should be Δz_i in denominator of right-hand-side]. In the nomenclature given on page 36, n is omitted.

9. The staff believes it would be prudent to inspect the tubes adjacent to R1C55 as part of each inservice steam generator tube inspection in order to confirm the analysis prediction that damage to these tubes is not occurring. Please discuss your plans in this regard.