

September 11, 1997

Mr. James M. Levine
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING GENERIC LETTER 92-08,
"THERMO-LAG 330-1 FIRE BARRIERS" FOR THE PALO VERDE NUCLEAR
GENERATING STATION (TAC NOS. M85583, M85584 AND M85585)

Dear Mr. Levine:

By letter dated January 24, 1997, Arizona Public Service Company submitted a response to the NRC Request for Additional Information (RAI) dated November 3, 1995, related to Generic Letter (GL) 92-08, "Thermo-Lag 330-1 Fire Barriers," for Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2 and 3. The staff, in conjunction with its contractor, Sandia National Laboratories (SNL), has reviewed the January 24, 1997, response and has determined that the additional information discussed in the enclosure is needed to complete the review of the ampacity derating factor determinations.

To assist the staff in completing its review of the application of Thermo-Lag 330-1 Fire Barriers at PVNGS, please respond in writing to this request for additional information within 30 days from the date of this letter.

If you have any questions, please contact me at (301) 415-1362.

Sincerely,

Original Signed By

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529
and STN 50-530

Enclosure: Request for Additional
Information

cc w/encl: See next page

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Mr. James M. Levine

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September 11, 1997

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REQUEST FOR ADDITIONAL INFORMATION

PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2 AND 3

FIRE BARRIER AMPACITY DERATING ISSUES

1. Sandia National Laboratories (SNL) found after a review of the licensee's cable ampacity assessment methodology (i.e., Leake Methodology) which is based on permitting some credit for the diversity of power cable loads as described in an IEEE Transactions paper by H. C. Leake entitled "Sizing Cables in Randomly-Filled Tray With Consideration for Load Diversity," that the licensee did not establish a basis for deciding when the subject method is appropriate or did not have sufficient checks to ensure that unrealistic results are not credited via the analysis. SNL recommended that the following set of limitations be established to resolve any potential misapplications or concerns regarding the use of the subject methodology:

- It is recommended that in the application of the Leake method to diverse random fill cable trays, the maximum baseline capacity limit, or maximum baseline heat intensity, should under no circumstance be assumed to exceed 80% of the corresponding open air limits. That is, any calculation that estimates a baseline ampacity limit (or equivalently the corresponding heat intensity level) that exceeds 80% of the cable's open air ampacity should be discounted and disregarded.
- The Leake method for crediting diversity should not be applied to the analysis of any cable whose diameter is greater than or equal to one half the tray fill depth as calculated using the ICEA definitions of cable cross-section and fill depth.
- The Leake method should not be applied to any cable tray with a diversity of 50% or more where, in this case, diversity is defined as the ratio of the cross-sectional area of cables which are assumed to carry continuous loads to the total cable mass cross-section.

The licensee is requested to consider the incorporation of the proposed recommendations by SNL into the application of the subject methodology or alternatively, to address the applicable concerns and criticisms as identified in the attached SNL report and to provide any direct test results which validates the Leake methodology.

2. SNL noted several discrepancies in both the maintained spacing and diversity based examples provided in the licensee submittal dated January 24, 1997.



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Specifically, the following discrepancy was noted for the maintained spacing analysis:

- The licensee should ensure that for the analysis of maintained spacing installed cables, the ampacity correction factors from Table VII of the IPCEA P-46-426 standard are being applied as appropriate to each case example. It would appear from the cited example that these factors have not been included in the assessment.

The following discrepancies were noted for the maintained spacing analysis:

- SNL was unable to reproduce to licensee's cited numerical results. In particular, SNL's calculations estimated a baseline ampacity limit lower than that cited by the licensee even though the same methodology was applied. It is recommended that the licensee resolve the apparent discrepancy regarding the cited diversity case example analysis, and to ensure that no similar discrepancies have been introduced into the other in-plant applications of the methodology.
- SNL's re-analysis of the example case indicated that the specific cable under study did not have sufficient margin to allow for estimated fire barrier derating impact. It is recommended that in resolving the numerical results discrepancy described immediately above, the licensee provide a resolution of the apparently overloaded cable in the cited example tray.

The licensee is requested to resolve the subject discrepancies and ensure that applicable licensee calculations are revised as necessary.

Attachment: Letter Report by Sandia National Laboratories



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