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ACCESSION NBR:9705190121 DOC.DATE: 97/05/09 NOTARIZED: NO DOCKET #
FACIL:STN-50-529 Palo Verde Nuclear Station, Unit 2, Arizona Publi 05000529
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LEVINE,J.M. Arizona Public Service Co. (formerly Arizona Nuclear Power
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk) See Lpt.

SUBJECT: Forwards non-proprietary & proprietary "Batwing Support Induced Wear Degradation of SG Tubing During Cycle 7" & "Prediction of Tube Water in Batwing Stay Cylinder Region for PVNGS SG 22 Operating Cycle 7.Proprietary rept withheld.

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CATEGORY 1 DOCUMENT

MA2

Commitment. Innovation. Energy.

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102-03931- JML/AKK/JRP
May 9, 1997

U. S. Nuclear Regulatory Commission
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Reference: Letter 102-03849-JML/AKK/JRP, dated January 19, 1997, from J. M. Levine, APS to NRC "Cycle 7 Steam Generator Evaluation Report"

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. 50-529
Operational Assessment

Accelerated steam generator heat transfer tube wear in the stay cylinder batwing region of steam generator 3-2 was discovered during the Unit 3 refueling 6 (U3R6) outage. The accelerated wear is attributed to increased central cavity fluid flow rates resulting from the installation of 26 flow distribution plate (FDP) by-pass holes in the tube bundle shroud during U3R5 outage. Steam generator 3-2 was subsequently modified to a 45 shroud hole configuration during U3R6, which will result in a higher central cavity flow for U3 Cycle 7 (U3C7) and potentially a corresponding increase in tube wear rate in the stay cylinder batwing region. The same configuration exists in steam generators 3-1 and 2-2. The possibility of accelerated tube wear in the stay cylinder batwing region due to increased central cavity flow was not recognized by ABB/CE, or APS prior to the modifications being installed in the steam generators in each unit. Tube wear in this region was first noticed in a Combustion Engineering plant following its first operating cycle in 1984. The original design PVNGS steam generators were less susceptible to accelerated wear rates in the stay cylinder batwing region due to lower central cavity flow rates than the earlier designed steam generators which had exhibited accelerated wear.

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APS has implemented a policy of plugging and, when appropriate, staking tubes susceptible to stay cylinder batwing flow induced wear. As a conservative measure, pending completion of a long term wear progression analysis, susceptible tubes in SG 3-1 and 3-2 have also been plugged as a preventative measure. Approximately 69 tubes were staked or plugged in each steam generator. However, if a leak should develop, an improved leak rate monitoring program and administrative limits on primary-to-secondary leakage provide additional confidence that an orderly shutdown would be conducted prior to a tube rupture occurring. In addition, APS has taken measures to provide operations personnel with diagnostic tools and improvements in leakage diagnostics via equipment upgrades, and protocol upgrades to the Emergency Operating Procedures. These actions permit faster identification and isolation of the affected steam generator should a steam generator tube rupture event occur.

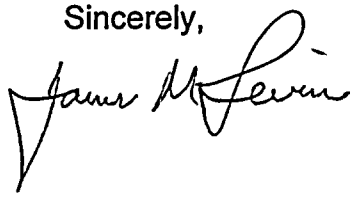
The accelerated tube wear rate in the stay cylinder batwing region is transportable only to Unit 2 SG 2-2. Based on the transportability of this condition to Unit 2, an evaluation of the significance of increased tube wear rates on the structural integrity of the steam generator tubing in SG 2-2 was performed by APS. The enclosed operational assessment for Unit 2 Cycle 7 demonstrates that the structural integrity margins specified by Regulatory Guide 1.121 are satisfied for the planned 16.5 month operating cycle. This assessment combined with the information presented in reference letter indicates that operation of the Unit 2 until the next scheduled refueling presents no significant risk to the health and safety of the general public.

Pursuant to section 2.790 (b) (1) of the regulations of the NRC, APS herewith submits an affidavit for consideration by the commission in determining whether information sought to be withheld from public disclosure, included in the enclosed report as Appendix A and B, should be withheld.

Also enclosed is a nonproprietary version of the report for your use in docketing the material.

Should you have any questions, please call Scott A. Bauer at (602) 393-5978. We will be pleased to meet with you at your convenience to discuss this report.

Sincerely,



JML/AKK/JRP/mah

Enclosure:

cc: E. W. Merschoff
K. E. Perkins
J. W. Clifford
K. E. Johnson
I. Barnes

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

I, I. C. Rickard, depose and say that I am the Director, Operations Licensing, of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conjunction with the application of Arizona Public Service Company, and in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations.

The information for which proprietary treatment is sought is contained in the following document:

> A-PVNGS-9416-1165, Rev. 0 - "Prediction of Tube Wear in the Batwing Stay Cylinder Region for Palo Verde Steam Generator 22, Operating Cycle 7," April, 1997

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure, is owned and has been held in confidence by Combustion Engineering. It consists of

information concerning tube wear predictions for tubes in the batwing central cavity wear region of the Unit 22 steam generator at Palo Verde.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F. M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject document herein is proprietary.

4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.

5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

   a. A similar product is manufactured and sold by major pressurized water reactor competitors of Combustion Engineering.

   b. Development of this information by Combustion Engineering required hundreds of thousands of dollars and thousands of

manhours of effort. A competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience to develop and validate analytical methods to predict steam generator tube wear.

d. The information consists of tube wear predictions for tubes in the batwing central cavity wear region of the Unit 22 steam generator at Palo Verde, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

e. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

f. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion

Engineering's potential for obtaining or maintaining foreign licensees.

Further the deponent sayeth not.

I.C. Rickard, Director
Operations Licensing

Sworn to before me
this 9th day of May, 1997

Carol L. Veilleux

Notary Public

My commission expires: _____

CAROL L. VEILLEUX
NOTARY PUBLIC
My Commission Expires Aug. 31, 2001

bcc: W. E. Ide
R. F. Schaller
K. M. Sweeney
S. A. Bauer
A. K. Krainik

CONCURRENCE

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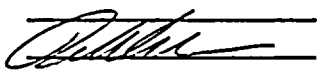
R. F. Schaller		(7696)
K. M. Sweeney	_____	(7696)
S. A. Bauer	_____	(7636)
A. K. Krainik	_____	(7636)

UFSAR CHANGES

None

COMMITMENTS

None

VERIFICATIONS OF ACCURACY

None