Entergy

Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043
Tel 269 764 2000

Anthony Vitale
Site Vice President

PNP 2011-057

July 20, 2011

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Minor Errors Identified in Spent Fuel Pool Region I LAR Criticality Analysis

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Reference: 1. Entergy Nuclear Operations, Inc. letter number PNP 2011-002, License Amendment Request for Spent Fuel Pool Region I Criticality, dated January 31, 2011.

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (ENO) submitted a license amendment request (LAR) which included proprietary and non-proprietary versions of AREVA NP Inc. Technical Report, numbers ANP-2858P-003, and ANP-2858NP-003, for the Palisades Nuclear Plant spent fuel pool region I criticality evaluation with burnup credit. AREVA NP Inc. has informed ENO of a minor error that is on two pages (pages 60 and 91) of the reports. The error has no affect on the results of the analysis.

The error was made in the evaluation of the critical value of the Student's T-distribution in the trending analysis for two different code bias determinations that are described in Appendix A of the report. The error was due to misinterpretation of the Excel TINV (T inverse) function as a single-sided lookup function like most standard reference tables. The amended paragraphs report the correct critical T-values based on the correct use of the (two-sided) Excel TINV function. These corrections have no affect on the results and conclusions of the trending analysis, and therefore, the calculated code biases are not changed by these corrections.

Attachment 1 contains the errata paragraphs for page 60 and page 91 of the AREVA reports described above.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 20, 2011.

Sincerely,

ajv/jlk

Attachment: 1. Errata for AREVA Technical Report ANP-2858P-003 and ANP-2858NP-003

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC
State of Michigan

ATTACHMENT 1
ERRATA FOR AREVA TECHNICAL REPORT
ANP-2858P-003 AND ANP-2858NP-003

Page 60, first paragraph, currently states:

The r^2 value represents the proportion of the sum of the squares for the y-values about their mean that can be attributed to a linear relation between x and y. The closer that r^2 approaches a value of one, the better the fit of the data to the linear equation. Calculated T_{Values} are compared with the critical value of the Student's T-distribution with a significance level of $\alpha = 0.05/2 = 0.025$ and $n - 2 = 98$ degrees of freedom, for which the Excel TINV function returns a value of 2.276. The null hypothesis for this test (H_0), is that the slope is not statistically significant; thus, a statistically significant trend may exist if: $|T_{Value}| > 2.276$. Alternatively, the probability of obtaining a T_{Value} of larger magnitude from a two-tailed T-distribution with the same $n - 2 = 98$ degrees of freedom is calculated by the Excel TDIST function. In general, a low probability (e.g. $p < 0.05$) is necessary to confirm that a statistically significant trend exists.

Amend to:

The r^2 value represents the proportion of the sum of the squares for the y-values about their mean that can be attributed to a linear relation between x and y. The closer that r^2 approaches a value of one, the better the fit of the data to the linear equation. Calculated T_{Values} are compared with the critical value of the (2-sided) Student's T-distribution with a significance level of $\alpha = 0.05$ and $n - 2 = 98$ degrees of freedom, for which the Excel TINV function (2-sided T-distribution) returns a value of 1.984. The null hypothesis for this test (H_0), is that the slope is not statistically significant; thus, a statistically significant trend may exist if: $|T_{Value}| > 1.984$. Alternatively, the probability of obtaining a T_{Value} of larger magnitude from a two-tailed T-distribution with the same $n - 2 = 98$ degrees of freedom is calculated by the Excel TDIST function. In general, a low probability (e.g. $p < 0.05$) is necessary to confirm that a statistically significant trend exists.

Page 91, last paragraph, currently states:

Results are summarized in Table A-16 and Table A-17, for weighted and non-weighted trends, respectively. Calculated T_{Values} are compared with the critical value of the Student's T-distribution with a significance level of $\alpha = 0.05/2 = 0.025$ and $n - 2 = 171$ degrees of freedom, for which the Excel TINV function returns a value of 2.261. The null hypothesis for this test (H_0), is that the slope is not statistically significant; thus, a statistically significant trend may exist if: $|T_{Value}| > 2.261$. In cases where a statistically significant trend is indicated by the Student's T-test, then the residuals of the regression are tested to determine if the error component is normally distributed with mean zero, which confirms that the statistical test for significance is valid. The Anderson-Darling test described in Reference [18] is employed for this purpose. The null hypothesis of normality is rejected if the value of A* exceeds the critical value of 0.752, at a significance level of 0.05. Therefore, if $A^* \leq 0.752$, then the residuals are distributed normally and the statistical test for significance is valid.

Amend to:

Results are summarized in Table A-16 and Table A-17, for weighted and non-weighted trends, respectively. Calculated T_{Values} are compared with the critical value of the (2-sided) Student's T-distribution with a significance level of $\alpha = 0.05$ and $n - 2 = 171$ degrees of freedom, for which the Excel TINV function (2-sided T-distribution) returns a value of 1.974. The null hypothesis for this test (H_0), is that the slope is not statistically significant; thus, a statistically significant trend may exist if: $|T_{Value}| > 1.974$. In cases where a statistically significant trend is indicated by the Student's T-test, then the residuals of the regression are tested to determine if the error component is normally distributed with mean zero, which confirms that the statistical test for significance is valid. The Anderson-Darling test described in Reference [18] is employed for this purpose. The null hypothesis of normality is rejected if the value of A* exceeds the critical value of 0.752, at a significance level of 0.05. Therefore, if $A^* \leq 0.752$, then the residuals are distributed normally and the statistical test for significance is valid.