Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

February 14, 2001
LIC-01-0018

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

References:
1. Docket No. 50-285
2. Operating License DPR-40 Amendment No. 158
3. Letter from OPPD (W. G. Gates) to NRC (Document Control Desk) dated June 23, 1993 (LIC-93-0119)
4. Letter from OPPD (W. G. Gates) to NRC (Document Control Desk) dated August 12, 1993 (LIC-93-0200)
5. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk) dated January 30, 1998 (LIC-98-0009)
6. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk) dated November 15, 1999 (LIC-99-0107)
7. Letter from NRC (L. R. Wharton) to OPPD (S. K. Gambhir) dated November 30, 1999
8. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk) dated January 24, 2000 (LIC-00-0005)
9. Letter from OPPD (W. G. Gates) to NRC (Document Control Desk) dated August 3, 2000 (LIC-00-0064)
10. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk) dated November 17, 2000 (LIC-00-0096)

**SUBJECT: Supplemental Information to Support an Application for Amendment of Operating License**

This letter provides supplemental information requested by the NRC Staff to assist in the review of the licensing action described below. In the Reference 9 letter, Omaha Public Power District (OPPD) submitted an *Application for Amendment of Operating License* which seeks to delete Section 3.D, *License Term* from the Fort Calhoun Station (FCS) Unit No. 1 Operating License No. DPR-40. The application included report CEN-636, Rev. 2, from Westinghouse Electric-CE Nuclear Power, *Evaluation of Reactor Vessel Surveillance Data Pertinent to the Fort Calhoun Reactor Vessel Beltline Materials – Basis for Prediction of $RT_{PTS}$ for the Fort Calhoun RPV,* dated July 19, 2000.

A001



Employment with Equal Opportunity

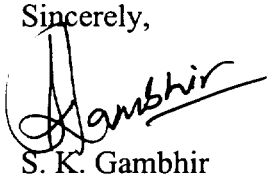
In Reference 10, OPPD provided supplemental proprietary information (Westinghouse - CE Nuclear Power Report CENPSD-1204-P, Revision 00, *Review of Mihama Unit 1 Surveillance Program Weld Metal Data,* dated October 23, 2000) required by the NRC Staff to support the review of the Reference 9 application.

In the course of reviewing the documents noted above, the NRC Staff raised questions concerning the details of the temperature adjustment procedure. To address these questions, OPPD provides the attached Westinghouse - CE Nuclear Power Report CE NPSD-1223, Rev. 00, *Additional Information Concerning Temperature Adjustment Procedure for Analysis of Surveillance Data,* dated February 2001.

The Reference 9 application is not included in the priority group of licensing actions needing approval to support the upcoming refueling outage or next operating cycle; however, OPPD requests approval of the Reference 9 application as soon as possible to support preparation of the Fort Calhoun Station License Renewal Application.

I declare under penalty of perjury under the laws of the United States of America that I am authorized by Omaha Public Power District to provide this information and that the foregoing is true and correct. Please contact me if you have any questions.

Sincerely,



S. K. Gambhir
Division Manager
Nuclear Operations

SKG/TCM/tcm

Attachment

c: E. W. Merschoff, NRC Regional Administrator, Region IV (w/o Attachment)
L. R. Wharton, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector (w/o Attachment)
B. E. Casari, Director - Environmental Health Division, State of Nebraska (w/o Attachment)
Winston & Strawn

# LIC-01-0018

# Attachment

CE NPSD-
1223, Rev 00

# Additional Information Concerning Temperature Adjustment Procedure for Analysis of Surveillance Data

## Report Prepared for Omaha Public Power District, Fort Calhoun Station

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**CE NPSD-1223, Rev 00**

# Additional Information Concerning Temperature Adjustment Procedure for Analysis of Surveillance Data

**February 2001**

Author: Stephen T. Byrne

Reviewer: C. L. Hoffmann

Approved: B. M. Hinton

**Verification Status: Complete**

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| REV. NO. | DATE | PAGES AFFECTED | PREPARED BY: | APPROVED BY: |
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| 00 | 2/9/01 | All | S. T. Byrne | C. L. Hoffmann<br>B. Hinton |

## INTRODUCTION

In Reference 1 relevant surveillance data were reviewed in order to evaluate the Fort Calhoun reactor pressure vessel (RPV) beltline materials with the purpose of demonstrating that the RPV materials will not exceed the pressurized thermal shock (PTS) screening criteria (Reference 2). As part of the analysis, surveillance data for evaluation of the Fort Calhoun RPV were analyzed using a temperature adjustment procedure in conjunction with the chemistry factor adjustment procedure in Position 2.1 of Regulatory Guide 1.99, Revision 2. In the course of reviewing Reference 1 questions were raised concerning the details of the temperature adjustment procedure. The questions are paraphrased below:

*Independent calculations are being done in order to verify the data analysis. Reference 1 states that the licensee used the TTS equation in NUREG/CR-6551 to calculate the predicted shift at both temperatures of interest, then the irradiation temperature effect is the difference in the two shifts that is added or subtracted from the measured shift (whichever is appropriate).*

*This is a new approach that is still under development and has several parameters. One of the inputs is phosphorous, which is not monitored as closely as copper and nickel. Please provide the calculation, with all of the inputs, for the comparison with Mihama and Ft. Calhoun (heat 12008/27204) and the calculation from the 27204/27204 irradiation temperature adjustment (Palisades, Diablo Canyon, Ft. Calhoun). If all of the calculations that were done using the NUREG equation are easily available, please provide those too, but the ones that were mentioned above are critical. The submittal has the end results of the temperature adjustments but not the details of how they got there.*

## DATA EVALUATION

Equations 4.1a through 4.1d from NUREG /CR-6551 (Reference 3) were used to compute shift at two different temperatures. The first temperature is that of the surveillance capsule from which the shift measurement was obtained. The second temperature is that of the reactor vessel (Fort Calhoun) for which the shift measurements are being used to refine the chemistry factor for use in 10CFR50.61 predictions of $RT_{PTS}$. Equations 4.1a through 4.1d differ from the equations in 10CFR50.61 in both format and variables. The unique variables in Equations 4.1a through 4.1d are as follows:

1- irradiation temperature
2- phosphorus content
3- irradiation time

Details concerning the format differences are available in Reference 3 and are not discussed further here.

Information regarding the irradiation temperature for each of the surveillance material measurements used in Reference 1 is presented in that document. Information regarding the phosphorus content and irradiation time for each of the surveillance materials and associated shift measurements were reported in the database associated with Reference 1 or were obtained as described in Tables 1 and 2.

For the Mihama 1 surveillance capsules, the irradiation time was estimated using the reported fluence and information from comparable capsules. In Reference 4, it was stated by Westinghouse (the designer of Mihama 1) that the surveillance capsules are similar to six other 2-loop Westinghouse plants. The reported neutron flux values (from Reference 3) for capsules from those six 2-loop plants are provided in Table 3. Each of the reported fluence values for the Mihama 1 capsules was divided by the average flux from the set of similar capsules to obtain the irradiation times reported in Table 2.

The reported fluence for Palisades SA-60 was 1.62 E19 n/cm$^2$. The reported flux in Reference 3 for a comparable capsule from Palisades, A-240 was 8.42 E11 n/cm$^2$/sec. The irradiation times reported above for Palisades SA-60 were estimated using these values of fluence and flux.

The data input for the results as cited in Reference 1 (CEN-636, Revision 2) are summarized in Table 4. The alternate data input are summarized in Table 5. (The "alternate data input" set represents different assumptions including the bases for the irradiation times described in the preceding paragraphs and Tables 2 and 3. It can be seen below that the assumptions about time and chemical content have at most a second order effect on the outcome of the temperature effect.) The output of spreadsheets showing the temperature adjustment process and results are provided in Tables 6 and 7. Table 6 labeled "Fort Calhoun Tcold Adjustment" gives the results as cited in Reference 1. Table 7 labeled "Fort Calhoun Tcold Adjustment Using Alternate Inputs" gives the same analysis but uses the phosphorus contents and irradiation times given in Table 5. The alternate phosphorus and time values were used to repeat the computation of chemistry factors done in Tables 4A and 6A of Reference 1. The chemistry factors were within 0.1°F (less than 0.05%). For heat 27204, the chemistry factors were 215.4°F versus 215.5°F, and for heat 12008/27204 were 206.7°F versus 206.6°F for the alternate and original assumptions, respectively. This difference is well within the uncertainty of the input data.

In the two sets, results of the temperature adjustment are given for the Mihama 1, Diablo Canyon 1 and Palisades data as reported in Reference 1. Results are also given for the Cook 1 and Salem 2 data for additional information, but the temperature adjustment method was not applied for these data in Reference 1.

For Tables 4 through 7 the following key is provided:

Plant- Reactor vessel and surveillance capsule identification.
Fluence- Fast fluence for capsule.
Phos- Phosphorus content, %.
Cu- Copper content, %.
Ni- Nickel content, %.
Temp- Irradiation Temperature, F Flux- Fast flux for capsule.
Time- irradiation time for capsule in hours.
SMD- Shift value based on Stable Matrix Defect (SMD) term (A=1.10E-7 for welds) using Ref. 3.
CRP- Shift value based on Copper Rich Precipitate (CRP) term (B=209) using Ref. 3.
Total- Sum of shift values from SMD and CRP terms using Ref. 3.
Delta Tc- Change in predicted shift based on difference in capsule versus vessel irradiation temperature using Ref. 3.
Meas. Shift- Measured Shift.
CF Ratio- Ratio of chemistry factors for vessel and surveillance weld per RG 1.99, Rev. 02, Position 2.1.
Shift at 543°F- Temperature adjusted shift, sum of measured shift and Delta Tc.
Adj. shift- Adjusted shift (CF Ratio multiplied by sum of measured shift and Delta Tc).

## SUMMARY & CONCLUSIONS

Information is provided concerning the data input assumptions used for the temperature adjustment procedure employed in Reference 1. The sensitivity of the temperature adjustment to the data input assumptions was addressed using an alternate set of data. The alternate set resulted in adjusted chemistry factors that were within 0.05% of those reported in Reference 1.

## REFERENCES

1) "Evaluation of Reactor Vessel Surveillance Data Pertinent to the Fort Calhoun Reactor Vessel Beltline Materials: Basis for Prediction of $RT_{PTS}$ for the Fort Calhoun RPV," CEN-636, Rev. 02, July 2000.

2) 10 CFR 50.61, "Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events," Federal Register, Vol. 60, No. 243, December 19, 1995.

3) E.D. Eason, et. al., "Improved Embrittlement Correlations for Reactor Vessel Steels", NUREG /CR-6551, November 1998.

4) S.L. Anderson, Westinghouse Report LTR-REA-00-618, June 22, 2000.

5) "Best Estimate Copper and Nickel Values in CE Fabricated Reactor Vessel Welds", CE NPSD 1039, Rev. 2, June 1997

**Table 1**
**Phosphorus Content of Surveillance Welds**

| Vessel Name | Phosphorus Content (w/o) | Source |
|---|---|---|
| Mihama 1 | 0.012 | Kansai |
| Diablo Canyon 1 | 0.013 | Reference 3 database |
| Palisades (Supplemental Capsule)* | <0.013 | Reference 5 |
| D. C. Cook 1 | 0.023 | Reference 3 Database |
| Salem 2 | 0.015 | Reference 3 Database |

*Weld Heat 27204 from Fort Calhoun nozzle drop-out.

**Table 2**
**Irradiation Time for Surveillance Capsules**

| Surveillance Capsule | Irradiation Time (hrs) | Source |
|---|---|---|
| Mihama 1 capsule 1 | 14140 | See Text and Table 3 |
| Mihama 1 capsule 2 | 30600 | See Text and Table 3 |
| Mihama 1 capsule 3 | 52300 | See Text and Table 3 |
| DC-1 capsule S | 11056 | NUREG /CR-6551 database |
| DC-1 capsule Y | 51389 | NUREG /CR-6551 database |
| Palisades SA-60 | 5348 | See Text |
| CK-1 capsule T | 11111 | NUREG /CR-6551 database |
| CK-1 capsule X | 29722 | NUREG /CR-6551 database |
| CK-1 capsule Y | 43333 | NUREG /CR-6551 database |
| CK-1 capsule U | 80556 | NUREG /CR-6551 database |
| SA-2 capsule T | 10444 | NUREG /CR-6551 database |
| SA-2 capsule U | 23667 | NUREG /CR-6551 database |
| SA-2 capsule X | 54444 | NUREG /CR-6551 database |

**Table 3**
**Basis for Mihama 1 Surveillance**
**Capsule Neutron Flux Estimate**

| Plant and Capsule Identification | Neutron Flux ($n/cm^2/sec$) |
|---|---|
| Kewaunee – P | 8.09E+10 |
| Kewaunee – R | 1.30E+11 |
| Kewaunee – V | 1.50E+11 |
| Pt. Beach 1 - R | 1.47E+11 |
| Pt. Beach 1 - S | 7.00E+10 |
| Pt. Beach 1 - T | 8.10E+10 |
| Pt. Beach 1 - V | 1.12E+11 |
| Pt. Beach 2 - R | 1.54E+11 |
| Pt. Beach 2 - S | 8.06E+10 |
| Pt. Beach 2 - T | 9.22E+10 |
| Pt. Beach 2 - V | 1.22E+11 |
| Prairie Island 1 - P | 8.09E+10 |
| Prairie Island 1 - R | 1.46E+11 |
| Prairie Island 1 - V | 1.28E+11 |
| Prairie Island 2 - T | 8.38E+10 |
| Prairie Island 2 - R | 1.46E+11 |
| Prairie Island 2 - V | 1.31E+11 |
| Ginna – V | 1.31E+11 |
| Ginna – R | 1.36E+11 |
| Ginna – S | 6.55E+10 |
| Ginna – T | 8.81E+10 |
| Average Flux | 1.12E+11 |

**Table 4- Input Data for Fort Calhoun Tcold (Original)**

| Plant | Fluence | Phos | Cu | Ni | Temp | Flux | Time (Hrs) |
|---|---|---|---|---|---|---|---|
| MH1-1 | 6.00E+18 | 0.013 | 0.19 | 1.08 | 552 | 3.00E+10 | 55550 |
| MH1-1 | 6.00E+18 | 0.013 | 0.19 | 1.08 | 543 | 3.00E+10 | 55550 |
| MH1-2 | 1.00E+19 | 0.013 | 0.19 | 1.08 | 552 | 3.00E+10 | 92600 |
| MH1-2 | 1.00E+19 | 0.013 | 0.19 | 1.08 | 543 | 3.00E+10 | 92600 |
| MH1-3 | 2.00E+19 | 0.013 | 0.19 | 1.08 | 552 | 3.00E+10 | 185000 |
| MH1-3 | 2.00E+19 | 0.013 | 0.19 | 1.08 | 543 | 3.00E+10 | 185000 |
| DC1-S | 2.84E+18 | 0.013 | 0.196 | 1.00 | 539 | 4.27E+10 | 18500 |
| DC1-S | 2.84E+18 | 0.013 | 0.196 | 1.00 | 543 | 4.27E+10 | 18500 |
| DC1-Y | 9.41E+18 | 0.013 | 0.196 | 1.00 | 540 | 4.27E+10 | 61200 |
| DC1-Y | 9.41E+18 | 0.013 | 0.196 | 1.00 | 543 | 4.27E+10 | 61200 |
| Palisades | 1.62E+19 | 0.013 | 0.194 | 1.08 | 533 | 2.43E+11 | 18500 |
| Palisades | 1.62E+19 | 0.013 | 0.194 | 1.08 | 543 | 2.43E+11 | 18500 |
| Cook 1-T | 2.69E+18 | 0.023 | 0.27 | 0.74 | 537 | 2.43E+11 | 3075 |
| Cook 1-T | 2.69E+18 | 0.023 | 0.27 | 0.74 | 543 | 2.43E+11 | 3075 |
| Cook 1-X | 8.13E+18 | 0.023 | 0.27 | 0.74 | 537 | 2.43E+11 | 9290 |
| Cook 1-X | 8.13E+18 | 0.023 | 0.27 | 0.74 | 543 | 2.43E+11 | 9290 |
| Cook 1-Y | 1.23E+19 | 0.023 | 0.27 | 0.74 | 537 | 2.43E+11 | 14100 |
| Cook 1-Y | 1.23E+19 | 0.023 | 0.27 | 0.74 | 543 | 2.43E+11 | 14100 |
| Cook 1-U | 1.77E+19 | 0.023 | 0.27 | 0.74 | 537 | 2.43E+11 | 20200 |
| Cook 1-U | 1.77E+19 | 0.023 | 0.27 | 0.74 | 543 | 2.43E+11 | 20200 |
| Salem 2-T | 2.75E+18 | 0.015 | 0.254 | 0.726 | 539 | 2.43E+11 | 3145 |
| Salem 2-T | 2.75E+18 | 0.015 | 0.254 | 0.726 | 543 | 2.43E+11 | 3145 |
| Salem 2-U | 5.50E+18 | 0.015 | 0.254 | 0.726 | 539 | 2.43E+11 | 6290 |
| Salem 2-U | 5.50E+18 | 0.015 | 0.254 | 0.726 | 543 | 2.43E+11 | 6290 |
| Salem 2-X | 1.07E+19 | 0.015 | 0.254 | 0.726 | 539 | 2.43E+11 | 12200 |
| Salem 2-X | 1.07E+19 | 0.015 | 0.254 | 0.726 | 543 | 2.43E+11 | 12200 |

**Table 5- Alternate Input Data for Fort Calhoun Tcold**

| Plant | Fluence | Phos | Cu | Ni | Temp | Flux | Time (Hrs) |
|---|---|---|---|---|---|---|---|
| MH1-1 | 5.70E+18 | 0.012 | 0.19 | 1.08 | 552 | 1.12E+11 | 14140 |
| MH1-1 | 5.70E+18 | 0.012 | 0.19 | 1.08 | 543 | 1.12E+11 | 14140 |
| MH1-2 | 1.23E +19 | 0.012 | 0.19 | 1.08 | 552 | 1.12E+11 | 30600 |
| MH1-2 | 1.23E +19 | 0.012 | 0.19 | 1.08 | 543 | 1.12E+11 | 30600 |
| MH1-3 | 2.11E+19 | 0.012 | 0.19 | 1.08 | 552 | 1.12E+11 | 52300 |
| MH1-3 | 2.11E+19 | 0.012 | 0.19 | 1.08 | 543 | 1.12E+11 | 52300 |
| DC1-S | 2.84E+18 | 0.013 | 0.196 | 1.00 | 539 | 7.15E+10 | 11056 |
| DC1-S | 2.84E+18 | 0.013 | 0.196 | 1.00 | 543 | 7.15E+10 | 11056 |
| DC1-Y | 9.41E+18 | 0.013 | 0.196 | 1.00 | 540 | 5.09E+10 | 51389 |
| DC1-Y | 9.41E+18 | 0.013 | 0.196 | 1.00 | 543 | 5.09E+10 | 51389 |
| Palisades | 1.62E+19 | 0.013 | 0.194 | 1.08 | 533 | 8.42E+11 | 5348 |
| Palisades | 1.62E+19 | 0.013 | 0.194 | 1.08 | 543 | 8.42E+11 | 5348 |
| Cook 1-T | 2.69E+18 | 0.023 | 0.27 | 0.74 | 537 | 6.72E+10 | 11111 |
| Cook 1-T | 2.69E+18 | 0.023 | 0.27 | 0.74 | 543 | 6.72E+10 | 11111 |
| Cook 1-X | 8.13E+18 | 0.023 | 0.27 | 0.74 | 537 | 7.60E+10 | 29722 |
| Cook 1-X | 8.13E+18 | 0.023 | 0.27 | 0.74 | 543 | 7.60E+10 | 29722 |
| Cook 1-Y | 1.23E+19 | 0.023 | 0.27 | 0.74 | 537 | 7.86E+10 | 43333 |
| Cook 1-Y | 1.23E+19 | 0.023 | 0.27 | 0.74 | 543 | 7.86E+10 | 43333 |
| Cook 1-U | 1.77E+19 | 0.023 | 0.27 | 0.74 | 537 | 6.11E+10 | 80556 |
| Cook 1-U | 1.77E+19 | 0.023 | 0.27 | 0.74 | 543 | 6.11E+10 | 80556 |
| Salem 2-T | 2.75E+18 | 0.015 | 0.254 | 0.726 | 539 | 7.32E+10 | 10444 |
| Salem 2-T | 2.75E+18 | 0.015 | 0.254 | 0.726 | 543 | 7.32E+10 | 10444 |
| Salem 2-U | 5.50E+18 | 0.015 | 0.254 | 0.726 | 539 | 6.45E+10 | 23667 |
| Salem 2-U | 5.50E+18 | 0.015 | 0.254 | 0.726 | 543 | 6.45E+10 | 23667 |
| Salem 2-X | 1.07E+19 | 0.015 | 0.254 | 0.726 | 539 | 5.45E+10 | 54444 |
| Salem 2-X | 1.07E+19 | 0.015 | 0.254 | 0.726 | 543 | 5.45E+10 | 54444 |

**Table 6- Fort Calhoun Tcold Adjustment**

| Plant | SMD | CRP | Total | Delta Tc | Meas. Shift | CF Ratio | Shift at 543°F | CF Adj. Shift |
|---|---|---|---|---|---|---|---|---|
| MH1-1 | 23.34 | 159.40 | 182.74 | 4.30 | 187.2 | 1.0170 | 191.50 | 194.8 |
| | 27.64 | 159.40 | 187.04 | | | | | |
| MH1-2 | 29.11 | 173.42 | 202.52 | 5.36 | 205.2 | 1.0170 | 210.56 | 214.1 |
| | 34.46 | 173.42 | 207.88 | | | | | |
| MH1-3 | 40.09 | 182.70 | 222.80 | 7.38 | 226.8 | 1.0170 | 234.18 | 238.2 |
| | 47.48 | 182.70 | 230.18 | | | | | |
| DC1-S | 22.14 | 116.54 | 138.69 | -1.62 | 113 | 1.0226 | 111.38 | 113.9 |
| | 20.52 | 116.54 | 137.06 | | | | | |
| DC1-Y | 35.51 | 164.65 | 200.16 | -1.97 | 233 | 1.0226 | 231.03 | 236.3 |
| | 33.54 | 164.65 | 198.20 | | | | | |
| Palisades | 52.01 | 184.33 | 236.34 | -9.06 | 250 | 0.9903 | 240.94 | 238.6 |
| | 42.95 | 184.33 | 227.28 | | | | | |
| Cook 1-T | 29.96 | 116.08 | 146.03 | -3.24 | 70 | 0.9162 | 66.76 | 61.2 |
| | 26.72 | 116.08 | 142.79 | | | | | |
| Cook 1-X | 46.90 | 167.28 | 214.18 | -5.07 | 146 | 0.9162 | 140.93 | 129.1 |
| | 41.83 | 167.28 | 209.11 | | | | | |
| Cook 1-Y | 56.47 | 176.18 | 232.65 | -6.10 | 184 | 0.9162 | 177.90 | 163.0 |
| | 50.37 | 176.18 | 226.55 | | | | | |
| Cook 1-U | 66.75 | 180.90 | 247.64 | -7.21 | 109 | 0.9162 | 101.79 | 93.3 |
| | 59.53 | 180.90 | 240.43 | | | | | |
| Salem 2-T | 23.31 | 109.21 | 132.51 | -1.71 | 145 | 0.9543 | 143.29 | 136.7 |
| | 21.60 | 109.21 | 130.81 | | | | | |
| Salem 2-U | 30.67 | 143.32 | 173.99 | -2.25 | 180 | 0.9543 | 177.75 | 169.6 |
| | 28.42 | 143.32 | 171.74 | | | | | |
| Salem 2-X | 40.81 | 161.30 | 202.11 | -2.99 | 188 | 0.9543 | 185.01 | 176.6 |
| | 37.82 | 161.30 | 199.12 | | | | | |

**Table 7- Ft. Calhoun Tcold Adj. Using Alternate Inputs**

| Plant | SMD | CRP | Total | Delta Tc | Meas. Shift | CF Ratio | Shift at 543°F | CF Adj. Shift |
|---|---|---|---|---|---|---|---|---|
| MH1-1 | 22.10 | 156.16 | 178.26 | 4.07 | 187.2 | 1.0170 | 191.27 | 194.5 |
| | 26.17 | 156.16 | 182.33 | | | | | |
| MH1-2 | 30.94 | 176.58 | 229.97 | 5.70 | 205.2 | 1.0170 | 210.90 | 214.5 |
| | 36.63 | 176.58 | 222.64 | | | | | |
| MH1-3 | 39.79 | 182.85 | 213.21 | 7.33 | 226.8 | 1.0170 | 234.13 | 238.1 |
| | 47.12 | 182.85 | 207.51 | | | | | |
| DC1-S | 22.14 | 115.70 | 137.85 | -1.62 | 113 | 1.0226 | 111.38 | 113.9 |
| | 20.52 | 115.70 | 136.23 | | | | | |
| DC1-Y | 35.51 | 164.54 | 200.05 | -1.97 | 233 | 1.0226 | 231.03 | 236.3 |
| | 33.54 | 164.54 | 198.08 | | | | | |
| Palisades | 52.04 | 184.29 | 236.33 | -9.06 | 250 | 0.9903 | 240.94 | 238.6 |
| | 42.97 | 184.29 | 227.27 | | | | | |
| Cook 1-T | 29.95 | 117.07 | 147.01 | -3.24 | 70 | 0.9162 | 66.76 | 61.2 |
| | 26.71 | 117.07 | 143.78 | | | | | |
| Cook 1-X | 46.90 | 167.64 | 214.54 | -5.07 | 146 | 0.9162 | 140.93 | 129.1 |
| | 41.83 | 167.64 | 209.47 | | | | | |
| Cook 1-Y | 56.32 | 176.30 | 232.61 | -6.09 | 184 | 0.9162 | 177.91 | 163.0 |
| | 50.23 | 176.30 | 226.53 | | | | | |
| Cook 1-U | 66.83 | 181.11 | 247.94 | -7.22 | 109 | 0.9162 | 101.78 | 93.2 |
| | 59.61 | 181.11 | 240.72 | | | | | |
| Salem 2-T | 23.31 | 110.08 | 133.39 | -1.71 | 145 | 0.9543 | 143.29 | 136.7 |
| | 21.60 | 110.08 | 131.68 | | | | | |
| Salem 2-U | 30.65 | 143.91 | 174.56 | -2.25 | 180 | 0.9543 | 177.75 | 169.6 |
| | 28.41 | 143.91 | 172.31 | | | | | |
| Salem 2-X | 40.82 | 161.70 | 202.53 | -2.99 | 188 | 0.9543 | 185.01 | 176.6 |
| | 37.83 | 161.70 | 199.54 | | | | | |

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