

Title: MODEL D-3 PREHEATER
TEMPERATURESCalculated by: A. J. BRECHNERDate: 1-27-83Checked by: Ed BudDate: 1-28-83Reviewed by: L. M. BUCKDate: 1/28/83

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Page 1 of _____PURPOSE:

The purpose of this calculation is to compare the measured temperatures in the D-3 steam generator preheater to those calculated by the TRAFLO computer program.

SUMMARY OF RESULTS:

In each of the three preheater passes for which measured temperature data is available the measured values bound the calculated values. The average of the measured values are somewhat higher than the calculated values away from the inlet pass of the preheater.

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The comparison between calculated and measured values is summarized in Table 1, below.

TABLE 1
COMPARISON OF CALCULATED AND MEASURED TEMPERATURES

| LOCATION | POWER | TRAFLO CALCULATION | RINGHALS MEASUREMENT |
|-------------------------|-------|-----------------------|-------------------------|
| Inlet Pass | ~ 98% | 451.0 | 446.5 ± 13.9 |
| 3rd Counterflow Pass | ~ 98% | 505.9 | 526.0 ± 16.3 |
| 1st Parallel Pass | ~ 98% | 477.4 | 491.8 ± 13.2 |
| Inlet Pass | ~ 84% | 452.1 | 436.8 ± 12.8 |
| 3rd Counterflow Pass | ~ 84% | 508.5 | 526.3 ± 15.6 |
| 1st Parallel Pass | ~ 84% | 479.7 | 490.2 ± 14.2 |

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MEASURED VALUES

The measured temperature values are presented in Table 2, below and were obtained from the Model D-3 steam generator RINGHALLS data forwarded by G. Lilly (NTD) letter dated April 30, 1982, by scaling from Figures 1 and 2 of that document.

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TABLE 2

PRE HEATER TEMPERATURE MEASUREMENTS AT RINGHALS

| PASS | POWER | | | | | |
|------------------------------|-------|-------|--------------------|------|-------|--------------------|
| | 98% | | | 84% | | |
| | DATA | MEAN | STANDARD DEVIATION | DATA | MEAN | STANDARD DEVIATION |
| INLET | 447 | 446.5 | 13.9 | 432 | 436.8 | 12.8 |
| | 453 | | | 441 | | |
| | 459 | | | 452 | | |
| | 427 | | | 422 | | |
| THIRD COUNTERFLOW PASS | 535 | 526.0 | 16.3 | 535 | 526.3 | 15.6 |
| | 537 | | | 535 | | |
| | 530 | | | 532 | | |
| | 502 | | | 503 | | |
| FIRST PARALLEL PASS | 497 | 491.8 | 13.2 | 498 | 490.2 | 14.2 |
| | 498 | | | 496 | | |
| | 500 | | | 498 | | |
| | 472 | | | 469 | | |

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CALCULATED VALUES

The calculated values were obtained from the 100% power and 86% power steady state runs with the TRAFLO programs included at the end of this Appendix. The model of the D-3 steam generator used for this calculation is described in Appendix B of this report. The nodes chosen for this comparison are as follows: Each set of 4 temperature measurements were located in the half of the preheater closest to the feed nozzle, i.e. away from the vertical divider plate. Thus the TRAFLO model under most representative

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of the measurements in the inlet pass is node 57. The TRANFLO node most representative of the measurements in the first parallel pass is node 56. Finally, since the third counterflow pass is represented by a single TRANFLO node, 49, this node was used to compare with the Ringhals measurements. In this case it is expected that the calculated temperature may be somewhat lower than measured (flow in this pass is outward from the divider plate toward the wrapper).