Dominion	PROCEDURE NO: 1-OPT-RX-001
SURRY POWER STATION	REVISION NO: 35
PROCEDURE TYPE: OPERATIONS PERIODIC TEST	UNIT NO: 1

PROCEDURE TITLE:

REACTOR POWER CALORIMETRIC USING PCS COMPUTER PROGRAM

REACT MGT						

REVISION SUMMARY:

Revised in response Reactor Engineering feedback

- Changed 80% 2036.8 MW_{th} to 2546 MW_{th} in Subsection 1.3.
- Delete Step 2.3.18 "ET NAF-2006-0116, Transmission of Required Actions Associated with Surry Unit 1 Cycle 21 (S1C21) Pattern RB Reload Safety Evaluation Addendum Supporting Operation with Dropped Rod.
- Changed 80 % to 100% in Subsection 4.2, Steps 6.3.4 and 7.1.1 last bullet.
- Change Step 4.5 to indicate that a code of F does not invalidate use of this procedure.

CONTINUOUS USE

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To provide instructions for performing the daily calibration of Nuclear Power Range Instruments against a heat balance standard IAW Technical Specification Table 4.1-1, Item 1.

1.2 This OPT is not required to be performed while the unit is shutdown. 1-OPT-RX-001, 1-OPT-RX-002, 1-OPT-RX-003, or 1-OPT-RX-004 must be performed daily after Reactor power exceeds 15 percent power. **(Reference 2.4.2)**

1.3 To provide instructions to ensure that Unit 1 will not be operated above 2546 MWth Reactor Power (shift average).

2.0 REFERENCES

2.1 **Source Documents**

2.1.1 UFSAR, Section 7.2.1, Reactor Protection System

2.1.2 UFSAR, Section 7.4, Nuclear Instrumentation System

2.2 **Technical Specifications Surry Power Station Unit 1 & 2**

2.2.1 Technical Specifications, Section 1.A, Rated Power

2.2.2 Technical Specifications, Table 3.7-1, Item 2, Nuclear Flux Power Range

2.2.3 Technical Specifications, Table 4.1-1, Item 1, Nuclear Power Range

2.3 Technical References

2.3.1 Phase 1 Results of Surry Unit 1 Efficiency Study

2.3.2 Phase 2 Results of Surry Unit 1 Efficiency Study

2.3.3 DCP 94-007-03, Removal of Turbine Runback on Dropped Rod

2.3.4 Technical Report NE-1076, A Review of the Secondary Calorimetric Calculation in the P-250 CALCALC Computer Program for Surry Power Station, Units 1 and 2

2.3.5 Technical Report EE-0108, Basis for the Steam Flow and Feedwater Flow Equations Used in the P-250 FLOWCALC Program

2.3.6 Technical Report NE-1084, A Standardized Model for Calculating Power Calorimetric Uncertainty, Surry and North Anna Power Stations, Units 1 and 2

2.3.7 Technical Report NE-1081, Power Calorimetric Task Team, Project Overview and Results, Summary Report for Surry Power Station, Units 1 and 2

2.3.8 Technical Report NE-1090, Power Calorimetric Input Notebook, Surry Units 1 and 2

2.3.9 Safety Evaluation 96-0102

2.3.10 ET-NAF-97-0239, Steam Flow vs. Feed Flow, impact of Calibration Tolerances

2.3.11 ET NAF 2000-003, Feedwater Flow Based Calorimetric

2.3.12 ET S-01-0122, Power Range Detector Operability Surry Power Station, Units 1 & 2

2.3.13 DCP 01-008, Instrument and Controls Upgrade Project, Unit 1

2.3.14 ET S-03-0052, Rev. 0, Use of 10 Minute Average Reactor Power for Calibration of Power Range NI

2.3.15 Primary Plant (PP) Functional Specification, NABU-FS-00072-VPA

2.3.16 Flow Corrections (FL) Functional Specification, NABU-FS-00098-VPA

2.3.17 ET NAF-03-0068, Evaluation of Plant Calorimetric Programs of the Ovation Computer System, Surry Power Station, Units 1 and 2, July 2003

2.4 **Commitment Documents**

2.4.1 CTS 1080, Unreliable Computer Points

2.4.2 CTS 1438, Revise procedures to require performance prior to applicable mode change (Technical Specifications Change 228B)

2.4.3 CTS 2753, Core Uprate

2.4.4 CTS 3423, Calorimetric Task Team

2.4.5 Plant Issue S-97-2350

2.4.6 Plant Issue S-99-2410, NIS Power Range Gain Adjustment

2.4.7 PI S-98-1461, Feedwater Temperature Bias on Power Calorimetric (ET No. NAF 98-0115, Rev. 1)

2.4.8 PI S-2004-4753, Calorimetric Invalid While on Excess Letdown

2.4.9 PI S-2005-0590, Coarse Adjustment

2.4.10 PI S-2005-1536, PCS Point Quality

2.4.11 PI S-2005-1251, Power Change When Condensate Polishing Vessel Placed in Service While on Feed Flow Calorimetric

2.4.12 PI S-2005-1511, Calorimetric Quality Downgrade

Init Verif

3.0 INITIAL CONDITIONS

_____ 3.1 Unit 1 is operating at a steady state power level of greater than or equal to 15% power.

_____ 3.2 Primary Plant Performance Program (PP) is operational.

_____ 3.3 Flow Corrections Program (FL) is operational.

_____ 3.4 Review Attachment 2 to verify that none of the PTs or Cal procedures are in progress. (If any of the listed PTs or Cal procedures are in progress, the values calculated in this calorimetric will be unreliable.)

_____ 3.5 Verify Excess Letdown is not in service.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Shift Supervision shall be notified immediately if any acceptance criteria is not met or if any malfunction or abnormal condition occurs.

4.2 Unit power shall be reduced immediately if the shift average power exceeds 100% Reactor Power, as determined by the Primary Plant Performance Program.

4.3 Changes to the NI channel indications will be made by a Licensed Reactor Operator under the supervision of a Senior Reactor Operator.

4.4 The shift average power shall be recorded no earlier than 30 minutes (for example, between 1430-1500, 2230-2300, and 0630-0700) before the end of each calorimetric period. The defined eight-hour calorimetric periods are 2300-0700, 0700-1500, and 1500-2300. The defined twelve-hour calorimetric periods are 0700-1900 and 1900-0700.

4.5 If computer indicates the calculation has POOR or BAD Quality or has any reason code, (for example, L, H, or S) reactor power must be calculated by using another method. (This does NOT include a code of F, Fair)

4.6 If an adjustment of the power range channels is required, alternate indications of power must be compared before the adjustment. If the difference is greater than 2%, Shift Supervision must be notified.

4.7 A wait of 5 minutes is required at a stable power level prior to recording Calcalc Total Thermal Pwr (U9104). A wait of 10 minutes is required at a stable power level prior to recording Calcalc 10 Min Avg Pwr (U9105).

4.8 If both compservers are rebooted, a 30 minute wait period is required prior to using any calorimetic values.

4.9 The Nuclear Regulatory Commission (NRC) Inspection Manual 61706 requires that the average power level over an eight (8) hour shift does not exceed the licensed power limit. (The NRC Inspection Manual also states that “the easiest definition is a normal shift manned by a particular “crew.”) The NRC permits excursions above the "full, steady state licensed power level" by as much as 2% for as long as 15 minutes. Lesser power excursions for correspondingly longer periods (i.e., 1 percent for 30 minutes, 1/2% for 60 minutes, etc.) are also allowed. In no case, however, is it allowable for 102% power to be exceeded. The NRC concludes that limiting shift average power to less than the reactor thermal power will preclude abuse of this tolerance.

4.10 When using Steam Flow as the basis for the calorimetric, Calcalc Total Thermal Pwr (U9104) does not have a filtered flow determination in the calculation. Its numerical value will be equal to Instantaneous Reactor Power. Calcalc 10 Min Avg Pwr (U9105) will be used when using Steam Flow as the basis for the calorimetric.

4.11 During the last 30 minutes of any shift the Steam Flow and Feedwater Flow Calorimetrics should agree within 0.57%. A deviation larger than this requires limiting Operation to the more conservative Reactor Power indication. Prior to the last 30 minutes of any shift, deviations of ≥ 0.57% are allowed.
(Ref. 2.3.10)

4.12 The initials identification block in Subsection 7.3 must be completed before the procedure is closed out.

4.13 Feedwater Flow is the preferred basis for the calorimetric. If evolutions occur during the shift that would invalidate only the Feed Flow calorimetric (e.g. opening the Feed Reg Bypass), the basis may be changed before the evolution occurs and the calorimetric will remain valid. This is accomplished using the PP display and the Select Steam Flow button. Once the evolution is complete, the Feed Flow calorimetric should be reselected. Reactor Engineering must be contacted prior to swapping to Steam Flow.

4.14 This procedure may be used both on 8 hour and 12 hour shifts.

4.15 Calorimetric indications are invalid while operating on Excess Letdown. Procedure 1-OPT-RX-007 should be initiated if Excess Letdown has been in service during this calorimetric shift.

4.16 The performance of the PTs or calibrations listed on Attachment 2 make the calorimetric unreliable. However, due to the way in which the PCS propagates point quality, the calorimetric will not necessarily go to POOR or BAD quality. (**Reference 2.4.10)**

4.17 Reactor power as indicated by calorimetric will fluctuate when a condensate polishing vessel is placed in service and feed flow is selected as the basis for the calorimetric. This does not cause the calorimetric to be invalid. (**Reference 2.4.11)**

4.18 Due to the way that the Time Average (TA) program propagates quality, short duration changes in quality may not propagate to longer period time average calorimetric PCS points. For example, when on Feed Flow, a momentary blip in Feedwater Flow quality would propagate to the instantaneous and 10-minute average, but most likely not to the hourly average. (**Reference 2.4.12)**

5.0 SPECIAL TOOLS AND EQUIPMENT

None

Init Verif

6.0 INSTRUCTIONS

6.1 Calculating Reactor Power, Using Primary Plant Performance Program

NOTE: The Primary Plant Performance program uses the corrected Steam Generator Feedwater Flows or Steam Flows as calculated by the Flow Corrections (FL) program to calculate reactor power according to the following equation.

$$\text{Reactor Power} = (h_{steam} - h_{feed}) \times \text{Flow}_{feed\ or\ steam} - \text{Added Pump Heat} - \text{Added Pressurizer Heat} + \text{(Steam) or} - \text{(Feed) Blowdown Heat Loss} + \text{Letdown Heat Loss} - \text{Added Charging Heat} + \text{Insulation Losses} - \text{Seal Water Injection Heat}$$

Where:

- Pump Heat equals 40.96×10^6 BTU/hr.
- Blowdown Flow is recorded from Control Room indications.
- Insulation losses equal 1.5 MW_{th}.

NOTE: Blowdown flow must be maintained as constant as possible. The most accurate data will be obtained by isolating blowdown, but isolation is not required.

6.1.1 Verify current blowdown flows correspond to entered constant values. IF NOT, THEN from the PCS operator's console, update the following constants on the PP Data Entry Screen (PP0200) with the current blowdown flows.

_____ a. FPP0001K SG A Blowdown Flow, from FI-BD-103A or FI-BD-104A

_____ b. FPP0002K SG B Blowdown Flow, from FI-BD-103B or FI-BD-104B

_____ c. FPP0003K SG C Blowdown Flow, from FI-BD-103C or FI-BD-104C

NOTE: The Unit 1 calorimetric should normally be based on Feedwater flow. If the deviation between Steam Flow and Feedwater Flow Calorimetrics was ≥ 0.57%, then the calorimetric may be based on Steam Flow.

NOTE: Feedwater Flow is the preferred basis for the calorimetric. If evolutions occur during the shift that would invalidate only the Feed Flow calorimetric (e.g. opening the Feed Reg Bypass), the basis may be changed before the evolution occurs and the calorimetric will remain valid. This is accomplished using the PP display and the Select Steam Flow button. Once the evolution is complete, the Feed Flow calorimetric should be reselected. Reactor Engineering must be contacted prior to swapping to Steam Flow.

_____ 6.1.2 Check the basis for Primary Plant Performance Program. (✓)

____ Steam Flow (K7030 = 1)

____ Feedwater Flow (K7030 = 0)

NOTE: Feedwater temperature can be obtained from PCS Point Review Group 118.

_____ 6.1.3 From the PCS Operator's console, check Feedwater temperatures. (✓) **(Reference 2.4.7)**

____ T0418A SG A Feedwater Temperature

____ T0438A SG B Feedwater Temperature

____ T0458A SG C Feedwater Temperature

_____ 6.1.4 IF Feedwater temperature for any loop is greater than or equal to 443°F, THEN notify Reactor Engineering. Otherwise, enter N/A. **(Reference 2.4.7)**

NOTE: Feed flow transmitter data will be invalid if feed flow transmitters are bypassed.

_____ 6.1.5 IF the calorimetric is based on feedwater flow AND the Feed Reg Bypass HCVs are NOT closed AND feedwater flow is NOT aligned through the feed flow transmitters, THEN close the Feed Reg Bypass HCVs OR align bypass flow to the feed flow transmitters to obtain Calcalc Total Thermal Power, initiate 1-OPT-RX-007, and enter N/A for Steps 6.3.1 through 6.3.4. Otherwise, enter N/A for this step.

_____ 6.1.6 IF Step 6.1.5 was performed, THEN wait 5 minutes before performing Step 6.1.7. Otherwise, enter N/A.

_____ 6.1.7 IF using Feed Flow as basis for calorimetric, THEN record the Calcalc Total Thermal Pwr (U9104). Otherwise, enter N/A.

Calcalc Total Thermal Pwr (U9104)_____%

NOTE: Turbine load must remain stable for 10 minutes prior to recording the Calcalc 10 Minute Avg Pwr.

_____ 6.1.8 IF using Steam Flow as basis for calorimetric, THEN record the Calcalc 10 Minute Avg Pwr (U9105). Otherwise, enter N/A.

Calcalc 10 Minute Avg Pwr (U9105)_____ %

_____ 6.1.9 IF the Feed Reg Bypass HCVs were closed in Step 6.1.5, THEN return the Feed Reg Bypass HCVs to desired position. Otherwise, enter N/A.

6.2 Adjusting NI Channels

_____ 6.2.1 Compare each NI channel percent power indication with the Calcalc Total Thermal Pwr (Feed Flow) or Calcalc 10-Min Avg Pwr (Steam Flow), whichever is the standard. (Each NI should be within + 2% and - 0% of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4% and - 0% of the Calorimetric value if Reactor power is less than 90%.)

CAUTION

Gain potentiometer adjustment can cause average flux deviation alarms as well as high flux rod stop alarms. This should be anticipated when adjusting gain potentiometers. **(Reference 2.4.6)**

_____ _____ SS 6.2.2 IF the NI Channel is within tolerance but adjustment will better align it with the calorimetric, THEN obtain Shift Supervision concurrence AND adjust NI Channel IAW Attachment 1 to the Calcalc Total Thermal Pwr (Feed Flow) value calculated in Step 6.1.7. or Calcalc 10-Min Avg Pwr (Steam Flow) value calculated in Step 6.1.8. Record initials on Attachment 1. IF no NI adjustment is made, OR NI is NOT within tolerance, THEN enter N/A.

_____ _____ SS 6.2.3 IF NI channel is NOT within tolerance, THEN obtain Shift Supervision concurrence AND adjust the gain potentiometer on the front panel of each NI Channel IAW Attachment 1 to the Calcalc Total Thermal Pwr (Feed Flow) value recorded in Substep 6.1.7. or Calcalc 10-Min Avg Pwr (Steam Flow) value calculated in Step 6.1.8. Record initials on Attachment 1. IF all NI channels are within tolerance, THEN enter N/A.

6.2.4 IF the front panel gain adjustment can NOT bring power of any channel within the required tolerance in Step 6.2.1 OR coarse level adjustment is desired, THEN perform all of the following. Otherwise, enter N/A.

_____ a. IF NI channel(s) is out of tolerance, THEN declare channel(s) inoperable. Otherwise, enter N/A.

_____ b. Obtain concurrence from the Reactor Engineer to adjust the Power Range NI channel using the coarse level adjustment potentiometer.

_____ c. IF channel N-43 coarse adjust is to be made, AND N-43 is the selected channel for the N-16 Radiation Monitor, THEN deselect N-43 using 1-MS-43-N16. Otherwise, enter N/A.

_____ d. IF channel N-44 coarse adjust is to be made, AND N-44 is the selected channel for the N-16 Radiation Monitor, THEN deselect N-44 using 1-MS-43-N16. Otherwise, enter N/A.

_____ e. IF channel N-44 coarse adjust is to be made, THEN place ROD CONT MOD SEL in Manual. Otherwise, enter N/A.

_____ f. Have a qualified Instrument Technician adjust the coarse level adjust potentiometer, R312, and the potentiometer on the front panel, until the front panel potentiometer is near mid-range and the Power Range NI channels are within + 2% and - 0% of the Calorimetric value if Reactor power is greater than or equal to 90%, OR within + 4% and - 0% of the Calorimetric value if Reactor power is less than 90%.

_____ g. Note in the comment section any Power Range NI channel adjusted using the coarse level adjustment potentiometer.

_____ h. IF the out-of-tolerance NI channel can NOT be properly adjusted, THEN comply with Tech Spec Table 3.7-1, Item 2.

_____ i. IF N-44 coarse adjust was performed, THEN wait a minimum of one minute AND reposition ROD CONT MOD SEL as directed by Shift Supervision.

_____ j. Reposition 1-MS-43-N16 as directed by Shift Supervision.

k. For each Power Range with a DROPPED ROD window LIT due to coarse adjust, perform the following. Otherwise, enter N/A.

_____ 1. Place the Power Range Test Switch in RESET.

_____ 2. Verify DROPPED ROD window is NOT LIT.

_____ 3. Return the Power Range Test Switch to NORMAL.

_____ 4. Verify annunciator 1G-H1, NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC, is NOT LIT.

_____ 6.2.5 IF any NI channel had been declared inoperable AND is now within tolerance, THEN declare the channel operable. Otherwise, enter N/A.

6.3 Verification of Shift Average Power

_____ 6.3.1 IF any of the following conditions occur or are initiated during the calorimetric period, THEN initiate 1-OPT-RX-007 for Shift Average Power Determination, AND enter N/A for Steps 6.3.2, 6.3.3, and 6.3.4. Otherwise, enter N/A for this step.

____ Any of the PTs or Calibration procedures listed in Attachment 2

____ The calorimetric is POOR or BAD

____ The PP program is out of service

____ Excess Letdown is or has been in service

_____ 6.3.2 Record the Calcalc Running Shift Avg Pwr.

Calcalc Running Shift Avg Pwr (U9103) _____%

NOTE: The difference between the Steam Flow and Feedwater Flow Calorimetrics should normally be less than 0.50% power. This limit only applies during the last 30 minutes of any shift.

6.3.3 IF Calcalc Running Shift Avg Power (U9103) is greater than 95%, THEN compare the Steam Flow and Feedwater Flow Calorimetric results. Otherwise, enter N/A.

_____ a. IF Steam/Feed Shift Power Diff (U1220) is ≥ 0.5%, THEN contact Reactor Engineering. Otherwise, enter N/A.

NOTE: Changing the basis for the calorimetric could render the NIs non-conservative, and the indication should be adjusted as required.

_____ b. IF Steam/Feed Shift Power Diff (U1220) is ≥ 0.57%, THEN limit Reactor Power based on the highest calorimetric AND verify or change K7030 to use the highest calorimetric (0=FF, 1=SF). Otherwise, enter N/A.

_____ 6.3.4 IF the Shift Average Reactor Power as recorded in Substep 6.3.2 is greater than 100 percent, THEN reduce the Unit power so that the Shift Average Reactor Power is at or less than 100%. IF the Shift Average Reactor Power is at or less than 100 percent, THEN enter N/A for this step.

7.0 FOLLOW-ON

7.1 Acceptance Criteria

_____ 7.1.1 Evaluate the test results by reviewing the Acceptance Criteria for the components tested. (✓)

- ___ All power range channels are found to be or are adjusted to be within +2, -0% (≥ 90% power) OR +4, -0% (< 90% power) of the Calcalc Total Thermal Pwr or Calcalc 10 Min Avg Pwr power level determined by the Primary Plant Performance program. Any adjustment shall be noted below.

  N-41 required adjustment _____ Yes _____ No

  N-42 required adjustment _____ Yes _____ No

  N-43 required adjustment _____ Yes _____ No

  N-44 required adjustment _____ Yes _____ No

- ___ Shift Average Reactor Power is at or less than 100%, as recorded in Step 6.3.2. Enter N/A if Steps 6.3.2, 6.3.3, and 6.3.4 were not performed.

_____ 7.1.2 Document the test results. (✓)

___ Satisfactory ___ Unsatisfactory

7.2 **Follow-On Tasks**

7.2.1 IF the test was unsatisfactory, THEN perform all of the following. Otherwise, enter N/A.

_____ a. Document the reason for the unsatisfactory test in Subsection 7.3, Operator Comments.

_____ b. Notify Shift Supervision and record the name.

Shift Supervision: _____

_____ c. Declare equipment inoperable.

_____ d. Notify Reactor Engineering and record the name of the person notified.

Reactor Engineer:_____

_____ e. Initiate a Condition Report and record the number.

CR No. _____

_____ f. Initiate a Work Request and record the number.

Work Request No. _____

_____ 7.2.2 IF a partial operability test was performed, THEN document the reason for the partial test in Subsection 7.3, Operator Comments. Otherwise, enter N/A.

7.3 Notification, Documentation, and Procedure Closeout

_____ 7.3.1 Notify Shift Supervision that the test is complete.

The Initials in this procedure will be identified by the Printed Name.

Initials	Printed Name

Operator Comments: _____

_____

_____

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Completed by: _____ Date: _____

7.4 **Reviewed**

Shift Supervision Comments:_____

_____

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_____

Reviewed by: _____ Date: _____
Shift Supervision

Forward original procedure to Station Records

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Attachment 1
NI CALIBRATION

CAUTION

High Flux Trip and High Flux Rod Stop setpoint changes required by the following step must be completed before any associated Gain Potentiometer adjustments are performed.

_____ 1. IF Reactor power is less than 90% AND the Gain Potentiometer on any NI will be decreased, THEN before adjusting NIs, have I & C lower the High Flux Trip and High Flux Rod Stop setpoints on all NIs based on current Reactor power level. Otherwise, enter N/A. **(Reference 2.4.5)**

Reactor Power Level	High Power Trip/Rod Stop Setpoint
≥ 55% < 90%	≤ 100% / ≤ 96%
≥ 35% < 55%	≤ 85% / ≤ 81%
≥ 25% < 35%	≤ 65% / ≤ 61%
< 25%	≤ 40% / ≤ 36%

	NI-41	NI-42	NI-43	NI-44
2) Place rod control to MANUAL. Enter N/A if NI-44 will NOT be adjusted.				
3) Record As Found NI power level for each channel to be adjusted. Enter N/A for channel(s) not being adjusted.				
4) Adjust the Gain Potentiometer on the front panel of each NI channel to the new Reactor Power value and initial appropriate block(s). Enter N/A for channel(s) not being adjusted.				
5) Record As Left NI power level for each channel adjusted. Enter N/A for channel(s) not adjusted.				
6) Allow at least one minute to pass before placing the rod control back to AUTO. Enter N/A if NI-44 was NOT adjusted.				

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Attachment 2

COMPUTER POINTS USED BY PRIMARY PLANT PERFORMANCE AND FLOW CORRECTIONS

Primary Plant Performance Constant Value Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
K0314	Insulation Heat Losses	1.5 MW_{th}	None
FPP0001K	SG A Blowdown Flow (Manual Input)	gpm	1-CAL-224 and 1-CAL-227
FPP0002K	SG B Blowdown Flow (Manual Input)	gpm	1-CAL-225 and 1-CAL-228
FPP0003K	SG C Blowdown Flow (Manual Input)	gpm	1-CAL-226 and 1-CAL-229
K2051	psig to psia conversion constant	14.7 psi	None
K7029	Alarm Inhibit	=1	None
	Print Alarm	≠1	None
K7030	Primary Plant Performance Based on Steam Flow	=1	None
	Primary Plant Performance Based on Feed Flow	=0	None

Primary Plant Performance and Flow Corrections Analog Inputs

Computer Point IDs	Description	Value/Units	PT/CAL
P0403A	SG A Feedwater Inlet Pressure (P-100A)	psig	1-IPM-FW-P-100A
P0423A	SG B Feedwater Inlet Pressure (P-100B)	psig	1-IPM-FW-P-100B
P0443A	SG C Feedwater Inlet Pressure (P-100C)	psig	1-IPM-FW-P-100C
Q0400A	Pressurizer Heater Power	KW	None
P0480A	Pressurizer Pressure Ch 1(P-455)	psig	1-IPT-FT(CC)-RC-P-455
T0418A	SG A Feed Water Temperature (RTD-111A)	°F	0-IPM-FW-RTD-001
T0438A	SG B Feed Water Temperature (RTD-111B)	°F	0-IPM-FW-RTD-001
T0458A	SG C Feed Water Temperature (RTD-111C)	°F	0-IPM-FW-RTD-001
F0128A	Charging Header Flow (F-122)	gpm	1-PT-2.13 (F-1-122)
P0142A	Charging Pump Disch Header Pressure (P-121)	psig	1-CAL-286
T0126A	Regen Hx Charging Outlet Temp (T-123)	°F	1-CAL-238
F0134A	NRHX Letdown Flow (F-150)	gpm	1-CAL-519
P0135A	Low Pressure Letdown Line Press (P-1-145)	psig	1-CAL-324
T0406A	RC Loop A Cold Leg Temp (T-410)	°F	1-IPT-RC-T-410
T0140A	Volume Control Tank Outlet Temp (T-116)	°F	1-CAL-237
T0145A	NRHX Letdown Line Outlet Temp (T-144)	°F	1-CAL-574

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Attachment 2
COMPUTER POINTS USED BY PRIMARY PLANT PERFORMANCE AND FLOW CORRECTIONS

Computer Point ID	Description	Value/Units	PT/CAL
F0405Y	SG A Steam Flow Ch 3 (F474)	volts	1-IPT-FT(CC)-MS-F-474
F0406Y	SG A Steam Flow Ch 4 (F475)	volts	1-IPT-FT(CC)-MS-F-475
F0425Y	SG B Steam Flow Ch 3 (F484)	volts	1-IPT-FT(CC)-MS-F-484
F0426Y	SG B Steam Flow Ch 4 (F485)	volts	1-IPT-FT(CC)-MS-F-485
F0445Y	SG C Steam Flow Ch 3 (F494)	volts	1-IPT-FT(CC)-MS-F-494
F0446Y	SG C Steam Flow Ch 4 (F495)	volts	1-IPT-FT(CC)-MS-F-495
F0403Y	Feedwater Flow Ch 4 (F476)	volts	1-IPT-FT(CC)-FW-F-476
F0404Y	Feedwater Flow Ch 3 (F477)	volts	1-IPT-FT(CC)-FW-F-477
F0423Y	Feedwater Flow Ch 4 (F486)	volts	1-IPT-FT(CC)-FW-F-486
F0424Y	Feedwater Flow Ch 3 (F487)	volts	1-IPT-FT(CC)-FW-F-487
F0443Y	Feedwater Flow Ch 4 (F496)	volts	1-IPT-FT(CC)-FW-F-496
F0444Y	Feedwater Flow Ch 3 (F497)	volts	1-IPT-FT(CC)-FW-F-497
P0400A	SG A Steam Pressure Ch 2 (P474)	psig	1-IPT-FT(CC)-MS-P-474
P0401A	SG A Steam Pressure Ch 3 (P475)	psig	1-IPT-FT(CC)-MS-P-475
P0402A	SG A Steam Pressure Ch 4 (P476)	psig	1-IPT-FT(CC)-MS-P-476
P0420A	SG B Steam Pressure Ch 2 (P484)	psig	1-IPT-FT(CC)-MS-P-484
P0421A	SG B Steam Pressure Ch 3 (P485)	psig	1-IPT-FT(CC)-MS-P-485
P0422A	SG B Steam Pressure Ch 4 (P486)	psig	1-IPT-FT(CC)-MS-P-486
P0440A	SG C Steam Pressure Ch 2 (P494)	psig	1-IPT-FT(CC)-MS-P-494
P0441A	SG C Steam Pressure Ch 3 (P495)	psig	1-IPT-FT(CC)-MS-P-495
P0442A	SG C Steam Pressure Ch 4 (P496)	psig	1-IPT-FT(CC)-MS-P-496