

FORT ST. VRAIN UNIT NO. 1Fluctuation Test SummaryRT-500Prepared By: R. A. Heller Date: 9-14-79Test No. One Date: 8-30-79 Time: 1630 HoursPlant Conditions Beginning of TestReactor Power 40 %Core Resistance 45.8Core ΔP 1.72 psiHelium Flow 55 %Avg. Core Outlet Temp. 1,189 °FAvg. Core Inlet Temp. 652 °FAvg. Main Steam Temp. 933 °FPrimary Coolant Activity 2.5×10^5 cpmFluctuation ConditionsMethod of inducing fluctuation Orifice valve adjustments to obtain region outlet differential temperatures required by RT-500F, Figure 1.Reactor Power Level 40 %

Largest Fluctuation Amplitude on Nuclear Channels (Peak to Peak)

Channel I 1* %Channel II 1* %Channel III 1* %Channel IV 1* %Channel V 1* %Channel VI 1* %

*Preliminary indications are that power level fluctuations of 1% can be correlated to regulating rod movement.

1070 339

Core Outlet Temperature (Identify Specific Regions) Preselcted Regions on Trend Recorders

Region 35 1,140 °F to 1,176 °FRegion 36 1,130 °F to 1,150 °F

A 7910020432

Steam Generator Modules

	<u>Largest Change, Module Main Steam Temp</u>	<u>Maximum Main Steam Temp Observed</u>
B-1-1	<u>910 °F to 945 °F</u>	<u>945</u>
B-1-2	<u>910 °F to 955 °F</u>	<u>955</u>
B-1-3	<u>915 °F to 950 °F</u>	<u>955</u>
B-1-4	<u>920 °F to 945 °F</u>	<u>955</u>
B-1-5	<u>925 °F to 960 °F</u>	<u>960</u>
B-1-6	<u>885 °F to 920 °F</u>	<u>920</u>
B-2-1	<u>930 °F to 950 °F</u>	<u>950</u>
B-2-2	<u>930 °F to 945 °F</u>	<u>945</u>
B-2-3	<u>925 °F to 945 °F</u>	<u>945</u>
B-2-4	<u>920 °F to 940 °F</u>	<u>940</u>
B-2-5	<u>900 °F to 925 °F</u>	<u>925</u>
B-2-6	<u>915 °F to 935 °F</u>	<u>935</u>

Time Fluctuation Started 1630 Time Fluctuation Terminated 1910

Method of fluctuation termination Reactor power reduction

Plant Conditions When Fluctuation Terminated

Reactor Power 35 %

Core Resistance 45.39

Core ΔP 1.51 psi

Avg. Core Outlet Temp. 1,150 °F

Avg. Core Inlet Temp. 659 °F

Primary Coolant Activity 2.5×10^5 cpm

1070 340

Remarks: (Provide a general description of the fluctuation including average periods, apparent areas of core involvement and any test limits that may have been exceeded.)

The time between start of fluctuation and termination of the fluctuation was a result of uncertainty as to whether or not fluctuations were taking place.

1070 341

FORT ST. VRAIN UNIT NO. 1Fluctuation Test SummaryRT-500

Prepared By: R.A. Heller Date: 9-14-79
 Test No. Two Date: 8-31-79 Time: 0313 Hours

Plant Conditions Beginning of Test

Reactor Power 40 %
 Core Resistance 44.84
 Core ΔP 1.62 psi
 Helium Flow 54 %
 Avg. Core Outlet Temp. 1,188 °F
 Avg. Core Inlet Temp. 647 °F
 Avg. Main Steam Temp. 930 °F
 Primary Coolant Activity 2.2×10^5 cpm

Fluctuation Conditions

Method of inducing fluctuation Reactor power increase.

Reactor Power Level 44 %

Largest Fluctuation Amplitude on Nuclear Channels (Peak to Peak)

Channel I 1* %
 Channel II 1* %
 Channel III 1* %
 Channel IV 1* %
 Channel V 1* %
 Channel VI 1* %

*Preliminary indications are that power level fluctuations of 1% can be correlated to regulating rod movement.

Core Outlet Temperature (Identify Specific Regions) Preselected Regions on Trend Recorders

Region 35 1,160 °F to 1,180 °F
 Region 36 1,160 °F to 1,180 °F

1070 342

Steam Generator Modules

	<u>Largest Change, Module Main Steam Temp</u>	<u>Maximum Main Steam Temp Observed</u>
B-1-1	<u>925 °F to 960 °F</u>	<u>960</u>
B-1-2	<u>920 °F to 950 °F</u>	<u>950</u>
B-1-3	<u>930 °F to 955 °F</u>	<u>955</u>
B-1-4	<u>925 °F to 945 °F</u>	<u>960</u>
B-1-5	<u>930 °F to 955 °F</u>	<u>955</u>
B-1-6	<u>925 °F to 940 °F</u>	<u>945</u>
B-2-1	<u>925 °F to 950 °F</u>	<u>950</u>
B-2-2	<u>930 °F to 940 °F</u>	<u>940</u>
B-2-3	<u>895 °F to 930 °F</u>	<u>930</u>
B-2-4	<u>910 °F to 930 °F</u>	<u>930</u>
B-2-5	<u>930 °F to 945 °F</u>	<u>945</u>
B-2-6	<u>905 °F to 945 °F</u>	<u>945</u>

Time Fluctuation Started 0337 Time Fluctuation Terminated 0354

Method of fluctuation termination Reactor power reduction

Plant Conditions When Fluctuation Terminated

Reactor Power 41 %

Core Resistance 44.13

Core ΔP 1.67 psi

Avg. Core Outlet Temp. 1,177 °F

Avg. Core Inlet Temp. 647 °F

Primary Coolant Activity 2.2×10^5 cpm

1070 343

Remarks: (Provide a general description of the fluctuation including average periods, apparent areas of core involvement and any test limits that may have been exceeded.)

1070 344

FORT ST. VRAIN UNIT NO. 1Fluctuation Test SummaryRT-500

Prepared By: R. A. Heller Date: 9-14-79
 Test No. Three Date: 9-1-79 Time: 0355 Hours

Plant Conditions Beginning of Test

Reactor Power 49 %
 Core Resistance 36.08
 Core ΔP 1.79 psi
 Helium Flow 64 %
 Avg. Core Outlet Temp. 1,247 °F
 Avg. Core Inlet Temp. 660 °F
 Avg. Main Steam Temp. 968 °F
 Primary Coolant Activity 2.8×10^5 c/m

Fluctuation Conditions

Method of inducing fluctuation Orifice valve adjustments to obtain region outlet differential temperatures required by RT-500F, Figure 1.

Reactor Power Level 49 %

Largest Fluctuation Amplitude on Nuclear Channels (Peak to Peak)

Channel I 1* %
 Channel II 1* %
 Channel III 1* %
 Channel IV 1* %
 Channel V 1* %
 Channel VI 1* %

*Preliminary indications are that power level fluctuations of 1% can be correlated to regulating rod movement.

1070 345

Core Outlet Temperature (Identify Specific Regions) Preselcted Regions on Trend Recorders

Region <u>35</u>	<u>1,170</u> °F	to <u>1,200</u> °F	Region <u>37</u>	<u>1,150</u> °F to <u>1,186</u> °F
Region <u>36</u>	<u>1,200</u> °F	to <u>1,214</u> °F	Region <u>20</u>	<u>1,080</u> °F to <u>1,100</u> °F

Steam Generator Modules

	<u>Largest Change, Module Main Steam Temp</u>	<u>Maximum Main Steam Temp Observed</u>
B-1-1	<u>945 °F to 970 °F</u>	<u>970</u>
B-1-2	<u>940 °F to 975 °F</u>	<u>975</u>
B-1-3	<u>945 °F to 975 °F</u>	<u>975</u>
B-1-4	<u>965 °F to 985 °F</u>	<u>985</u>
B-1-5	<u>945 °F to 975 °F</u>	<u>975</u>
B-1-6	<u>950 °F to 970 °F</u>	<u>970</u>
B-2-1	<u>960 °F to 970 °F</u>	<u>970</u>
B-2-2	<u>960 °F to 970 °F</u>	<u>970</u>
B-2-3	<u>955 °F to 965 °F</u>	<u>965</u>
B-2-4	<u>955 °F to 965 °F</u>	<u>965</u>
B-2-5	<u>950 °F to 965 °F</u>	<u>965</u>
B-2-6	<u>955 °F to 965 °F</u>	<u>965</u>

Time Fluctuation Started 0415 Time Fluctuation Terminated 0455Method of fluctuation termination Reactor power reductionPlant Conditions When Fluctuation Terminated

Reactor Power 41 %
 Core Resistance 37.6
 Core ΔP 1.63 psi
 Avg. Core Outlet Temp. 1,199 °F
 Avg. Core Inlet Temp. 648 °F
 Primary Coolant Activity 2.8×10^5 cpm

1070 346

Remarks: (Provide a general description of the fluctuation including average periods, apparent areas of core involvement and any test limits that may have been exceeded.)

1070 347

FORT ST. VRAIN UNIT NO. 1Fluctuation Test SummaryRT-500Prepared By: R. A. Heller Date: 9-14-79Test No. Four Date: 9-1-79 Time: 0907Plant Conditions Beginning of TestReactor Power 46 %Core Resistance 37.3Core ΔP 1.88 psiHelium Flow 64 %Avg. Core Outlet Temp. 1,197 °FAvg. Core Inlet Temp. 661 °FAvg. Main Steam Temp. 949 °FPrimary Coolant Activity 2.8×10^5 cpmFluctuation ConditionsMethod of inducing fluctuation Reactor power increaseReactor Power Level 48 %Largest Fluctuation Amplitude on Nuclear Channels (Peak to Peak)Channel I 1* %Channel II 1* %Channel III 1* %Channel IV 1* %Channel V 1* %Channel VI 1* %

*Preliminary indications are that power level fluctuations of 1% can be correlated to regulating rod movement.

1070 348

Core Outlet Temperature (Identify Specific Regions) Presampled Regions on Trend Recorders

Region 35 1,160 °F to 1,184 °F Region 37 1,129 °F to 1,149 °FRegion 36 1,170 °F to 1,185 °F Region 20 1,054 °F to 1,068 °F

Steam Generator Modules

	<u>Largest Change, Module Main Steam Temp</u>	<u>Maximum Main Steam Temp Observed</u>
B-1-1	<u>945 °F to 965 °F</u>	<u>965</u>
B-1-2	<u>930 °F to 960 °F</u>	<u>960</u>
B-1-3	<u>935 °F to 955 °F</u>	<u>955</u>
B-1-4	<u>945 °F to 960 °F</u>	<u>960</u>
B-1-5	<u>935 °F to 955 °F</u>	<u>955</u>
B-1-6	<u>935 °F to 950 °F</u>	<u>950</u>
B-2-1	<u>945 °F to 955 °F</u>	<u>955</u>
B-2-2	<u>950 °F to 965 °F</u>	<u>965</u>
B-2-3	<u>945 °F to 960 °F</u>	<u>960</u>
B-2-4	<u>945 °F to 960 °F</u>	<u>960</u>
B-2-5	<u>945 °F to 960 °F</u>	<u>960</u>
B-2-6	<u>940 °F to 950 °F</u>	<u>955</u>

Time Fluctuation Started 0928 Time Fluctuation Terminated 1017Method of fluctuation termination Reactor power reductionPlant Conditions When Fluctuation Terminated

Reactor Power 39 %
 Core Resistance 37.6
 Core ΔP 1.63 psi
 Avg. Core Outlet Temp. 1,199 °F
 Avg. Core Inlet Temp. 648 °F
 Primary Coolant Activity 2.8 x 10⁵ cpm

1070 349

Remarks: (Provide a general description of the fluctuation including average periods, apparent areas of core involvement and any test limits that may have been exceeded.)

1070 350