

PUBLIC SERVICE COMPANY OF COLORADO  
FORT ST. VRAIN NUCLEAR GENERATING STATION

MONTHLY OPERATIONS REPORT

NO. 91

JULY, 1981

FORM 288 2-2 0218

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PDR ADOCK 05000267  
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This report contains the highlights of the Fort St. Vrain Unit No. 1, activities operated under the provisions of the Nuclear Regulatory Commission Operating License DPR-34. This report is for the month of July, 1981.

## 1.0 NARRATIVE SUMMARY OF OPERATING EXPERIENCE AND MAJOR SAFETY RELATED MAINTENANCE

### 1.1 Summary

The refueling efforts continued until July 6, when the last load of fuel was put in region 32. The installation of the new "B" circulator and other shutdown maintenance activities prevented start-up until July 13th.

The reactor was brought critical on July 13th in preparation for the training starts by the reactor operator candidates. These starts were administered by the NRC beginning July 14th. The reactivity discrepancy between the observed and predicted criticality was  $.006 \Delta\rho$  which exceeded the  $\pm .003 \Delta\rho$  administrative limit. The reason for the unusually large discrepancy has been resolved.

A scram on high moisture was received on July 16th when a high level moisture monitor spuriously tripped. The reactor was brought critical again in 4 1/2 hours.

The reactor power was increased to about 25% on July 22nd. The turbine generator was synchronized for testing to verify that the repairs made during the shutdown had solved the vibration problem. Power was then reduced to facilitate clean-up of the reactor primary coolant.

A loop 1 shutdown occurred on July 23rd when all of the loop 1 normal bearing water pumps tripped due to low surge tank level. The back-up bearing water system was fully operational and the resultant bearing water accumulator firing introduced moisture into the vessel. The reactor was pumped down through the purification system to remove as much moisture as possible.

The high moisture levels in the PCRV prevented increasing reactor power enough to roll the turbine generator until July 26th. The turbine was on line for the remainder of the month at about 85 MW with moisture concentration precluding any further power increase.

### 1.2 Operations

The last load of fuel was put in region 32 on July 6th. This completed the actual fuel loading but further

preparations remained before the vessel could be pressurized.

Clean-up of water chemistry for the secondary side was started on July 7th. Both steam generator loops were dumped later that day in an attempt to improve the water quality. During the process of dumping there was a short 30 minute period where all cooling was stopped because both loops were draining simultaneously. It was necessary to drain the steam generators several more times before the correct water chemistry was obtained.

The PCRV was evacuated July 8th with the purge vacuum pumps and backfilled with helium to a pressure of 85 psi on July 10th. A purification system train was put in service at that time to improve primary coolant clean up.

The liquid nitrogen system was purged with gaseous nitrogen and then cooled down with liquid on July 13 following repairs on the system. Both high level monitors were put in service after filling the dewars using the initial fill piping. The reactor was then brought critical at 2202 that day in preparation for operator qualification training starts. The observed reactivity discrepancy between the calculated and predicted rod heights represented  $0.0067 \Delta\rho$  which exceeded the  $0.003 \Delta\rho$  allowed without management authorization. This permission was then obtained and the reactor remained critical. General Atomic and Public Service Company had been in discussions about the predicted rod height calculation. The conclusion was drawn that the discrepancy was primarily due to utilizing estimated core burn-up figures in calculating the base reactivity rather than the actual burn-up figure.

Operator training starts for the reactor operator qualification procedure were administered by the NRC beginning July 14, and the reactor remained less than 2%. The written and walk around portions of this qualification procedure were completed later in July.

A two loop trouble scram caused by a spurious trip of a high level moisture monitor occurred at 1515 on July 16th. The reactor power level at the time was 1% and the reactor was again critical at 1952.

The reactor power was gradually increased as allowed by moisture limitations until July 22nd when the turbine generator was synchronized at 0008. The turbine testing was completed in 2 1/2 hours and test results verified that the vibration problem had been resolved by the repairs made to

the low pressure turbine blading. The power increase to synchronize the turbine caused the moisture to increase and the power was reduced to 14% after the testing was completed.

Reactor power was increased on July 23rd and the turbine synchronized at 2025. All the bearing water pumps in loop 1 tripped at 2232 due to low level in the surge tank. This caused both circulators to trip and resulted in a loop 1 shutdown.

The bearing water accumulators fired during the circulator shutdown and moisture was introduced into the vessel. The trip of the bearing water pumps on low surge tank level occurred when P-2105 was taken out of service and there was inadequate pressure available on the emergency feedwater header to supply sufficient make-up to maintain normal level in the surge tank. Reactor power was then reduced to 2% to put loop 1 in service.

The reactor was pumped down to storage through the purification train on July 24th and repressurized on July 25th in an attempt to remove the moisture introduced during the circulator trips on July 23rd.

The reactor power was again gradually increased till 1834 on July 26th when turbine was synchronized and loaded to 68 MW. The load was gradually increased to 83 MW on July 26th and was held there due to moisture limitations.

"D" circulator tripped on July 29th when PDV-2192, a back-up bearing water control valve, inadvertently opened. A buffer system upset caused the circulator to trip. "C" circulator properly compensated for the loss of "D" and no significant change in power was observed. "D" circulator was then restarted without any problems.

"B" circulator tripped on buffer/mid buffer on July 30th when the knock out pots on the sensing line for buffer instrumentation were being blown down. No significant change in reactor power was observed after the trip and the circulator was immediately restarted.

The reactor power at month's end was being held at 31.8%, 87 MW because of high moisture in the primary coolant and the limitation of LCO 4.2.11.

2.0 SINGLE RELEASES OF RADIOACTIVITY OR RADIATION EXPOSURE IN EXCESS  
OF 10% OF THE ALLOWABLE ANNUAL VALUE

None

3.0 INDICATION OF FAILED FUEL RESULTING FROM IRRADIATED FUEL  
EXAMINATIONS

None

4.0 MONTHLY OPERATING DATA REPORT

Attached

OPERATING DATA REPORTDOCKET NO. 50-267DATE 810803COMPLETED BY L. M. McBri'leTELEPHONE (303) 785-2224OPERATING STATUS

## NOTES

1. Unit Name: Fort St. Vrain
2. Reporting Period: 810701 through 810731
3. Licensed Thermal Power (Mwt): 842
4. Nameplate Rating (Gross MWe): 342
5. Design Electrical Rating (Net MWe): 330
6. Maximum Dependable Capacity (Gross MWe): 342
7. Maximum Dependable Capacity (Net MWe): 330
8. If Changes Occur in Capacity Ratings (Items Number 3 Through 7) Since Last Report, Give Reasons:
- None
9. Power Level To Which Restricted, If Any (Net MWe): 231
10. Reasons for Restrictions, If Any: NRC restriction 70% pending resolution of  
temperature fluxuations.

	This Month	Year to Date	Cumulative
11. Hours in Reporting Period	<u>744</u>	<u>5,087</u>	<u>18,288</u>
12. Number of Hours Reactor Was Critical	<u>391.2</u>	<u>3,056.7</u>	<u>12,191.9</u>
13. Reactor Reserve Shutdown Hours	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
14. Hours Generator On-Line	<u>130.0</u>	<u>2,261.5</u>	<u>7,954.8</u>
15. Unit Reserve Shutdown Hours	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
16. Gross Thermal Energy Generated (MWH)	<u>56,828.1</u>	<u>1,159,414.9</u>	<u>3,867,507.7</u>
17. Gross Electrical Energy Generated (MWH)	<u>10,443</u>	<u>410,888</u>	<u>1,282,682</u>
18. Net Electrical Energy Generated (MWH)	<u>4,172</u>	<u>373,477</u>	<u>1,172,778</u>
19. Unit Service Factor	<u>17.5</u>	<u>44.5</u>	<u>43.5</u>
20. Unit Availability Factor	<u>17.5</u>	<u>44.5</u>	<u>43.5</u>
21. Unit Capacity Factor (Using MDC Net)	<u>1.7</u>	<u>22.2</u>	<u>19.4</u>
22. Unit Capacity Factor (Using DER Net)	<u>1.7</u>	<u>22.2</u>	<u>19.4</u>
23. Unit Forced Outage Rate	<u>34.3</u>	<u>35.7</u>	<u>36.9</u>

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of Each): Maintenance/modification  
shutdown September 1, 1981 lasting 4 months.

25. If Shut Down at End of Report Period, Estimated Date of Startup: N/A

26. Units In Test Status (Prior to Commercial Operation):

INITIAL CRITICALITY

INITIAL ELECTRICITY

COMMERCIAL OPERATION

Forecast

Achieved

N/AN/AN/AN/AN/AN/A



## DOCKET NO. 50-267

UNIT NAME  
Fort St. Vrain

DATE 810803

COMPLETED BY L. M. McBride

TELEPHONE (303) 785-2224

REPORT MONTH July, 1981

[illegible]

# AVERAGE DAILY UNIT POWER LEVEL

Docket No. 50-267

Unit Fort St. Vrain

Date 810803

Completed By L. M. McBride

Telephone (303) 785-2224

Month July, 1981

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

1	<u>0.0</u>
2	<u>0.0</u>
3	<u>0.0</u>
4	<u>0.0</u>
5	<u>0.0</u>
6	<u>0.0</u>
7	<u>0.0</u>
8	<u>0.0</u>
9	<u>0.0</u>
10	<u>0.0</u>
11	<u>0.0</u>
12	<u>0.0</u>
13	<u>0.0</u>
14	<u>0.0</u>
15	<u>0.0</u>
16	<u>0.0</u>

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

17	<u>0.0</u>
18	<u>0.0</u>
19	<u>0.0</u>
20	<u>0.0</u>
21	<u>0.0</u>
22	<u>0.0*</u>
23	<u>0.0*</u>
24	<u>2.88</u>
25	<u>0.0</u>
26	<u>0.0</u>
27	<u>61.96</u>
28	<u>71.92</u>
29	<u>70.33</u>
30	<u>74.71</u>
31	<u>79.54</u>

\*Generator on line but no net generation.



# REFUELING INFORMATION

1. Name of Facility.	Fort St. Vrain Unit No. 1
2. Scheduled date for next refueling shutdown.	October 1, 1982
3. Scheduled date for restart following refueling.	December 1, 1982
4. Will refueling or resumption of operation thereafter require a technical specification change or other license amendment?	No
If answer is yes, what, in general, will these be?	-----
If answer is no, has the reload fuel design and core configuration been reviewed by your Plant Safety Review Committee to determine whether any unreviewed safety questions are associated with the core reload (Reference 10CFR Section 50.59)?	The Plant Operations Review Committee will review any questions associated with the reload.
If no such review has taken place, when is it scheduled?	May 1, 1981
5. Scheduled date(s) for submitting proposed licensing action and supporting information.	-----
6. Important licensing considerations associated with refueling, e.g., new or different fuel design or supplier, unreviewed design or performance analysis methods, significant changes in fuel design, new operating procedures.	-----
7. The number of fuel assemblies (a) in the core and (b) in the spent fuel storage pool.	1482 HTGR fuel elements 250 spent HTGR fuel elements
8. The present licensed spent fuel pool storage capacity and the size of any increase in licensed storage capacity that has been requested or is planned, in number of fuel assemblies.	Capacity is limited in size to about one-third of core (approximately 500 HTGR elements). No change is planned.

REFUELING INFORMATION (CONTINUED)

9. The projected date of the last refueling that can be discharged to the spent fuel pool assuming the present licensed capacity.	1986 under the Three Party Agreement (Contract AT (04-3)-633) between DOE, Public Service Company of Colorado (PSCo), and General Atomic Company.*
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\*The 1986 date is based on the understanding that spent fuel discharged during the term of the Three Party Agreement will be shipped to the Idaho National Engineering Laboratory for storage by DOE at the Idaho Chemical Processing Plant (ICPP). The storage capacity has evidently been sized to accommodate fuel which is expected to be discharged during the eight year period covered by the Three Party Agreement.