



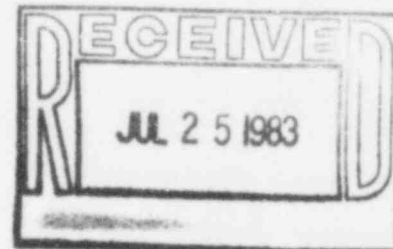
Public Service Company of Colorado

50-267

16805 Road 19 1/2, Platteville, Colorado 80651-9298

July 21, 1983
Fort St. Vrain
Unit No. 1
P-83251

Mr. John T. Collins, Regional Administrator
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011



Reference: Facility Operating License
No. DPR-34

Docket No. 50-267

Dear Mr. Collins:

Enclosed please find a copy of Reportable Occurrence Reports No. 50-267/77-043, 50-267/80-007, 50-267/80-020, 50-267/81-024, and 50-267/83-022, Revised Finals, submitted per the requirements of Technical Specification AC 7.5.2(b)2.

Also, please find enclosed one copy of the Licensee Event Report for Reportable Occurrence Reports No. 50-267/77-043, 50-267/80-007, 50-267/80-020, 50-267/81-024, and 50-267/83-022.

Very truly yours,

Don Warembourg by Milt McBride
Don Warembourg
Manager, Nuclear Production

DW/djm

Enclosures

cc: Director, MIPC

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REPORT DATE: July 21, 1983

REPORTABLE OCCURRENCE 77-43

ISSUE 1

OCCURRENCE DATE: November 26, 1977

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FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO
16805 WELD COUNTY ROAD 19 1/2
PLATTEVILLE, COLORADO 80651-9298

REPORT NO. 50-267/77-43/03-X-1

Final

IDENTIFICATION OF
OCCURRENCE:

During rise-to-power testing, while at approximately 63% thermal power, the reactor was operated with an individual region outlet temperature greater than the limit of LCO 4.1.7(a) for continuous operation. This constitutes operation in a degraded mode permitted by LCO 4.1.7(a) and is reportable per Fort St. Vrain Technical Specification AC 7.5.2(b)2.

EVENT
DESCRIPTION:

During power ascension testing, it was discovered that at reactor power levels in excess of about 53%, the power output of some core regions began to oscillate. Although individual core regions appeared to be oscillating in power, the average core power remained essentially constant. One result of the oscillations was observed to be an apparent corresponding variation in region gas outlet temperature. Prior to the event described in this report, no LCO limit had been exceeded during the region power oscillations.

Region power oscillations had been seen and documented for later analysis on three previous occasions at 53%, 55%, and 59% thermal power. At the time of this event, reactor power level was increased from 53% at 1248 hours to 68% at 1510 hours. The reactor operated at 68% power until 1550 hours when oscillations began. At approximately 1600 hours, the operator initiated a reduction in reactor power to 63% which was reached at 1610 hours. Reactor power level was held at 63% until 1650 hours while primary coolant flow through the entire core and then through a single region was increased to record the effect of this change on the oscillations. When the observations of the effect of the flow changes were completed, a reactor power reduction to 53% power was initiated, and 53% power was reached at 1843 hours. Oscillations stopped at 1930 hours.

During operation between 1610 hours and 1715 hours, the Region 28 outlet temperature exceeded the region outlet temperature limit of LCO 4.1.7(a) on several occasions (see Table 1). For a region whose control rod is inserted more than two feet (applicable to Region 28 at this time), LCO 4.1.7(a) limits the outlet temperature of the

region to core average outlet temperature plus 50 degrees fahrenheit. The LCO, however, also specifies that if the limit is exceeded at less than 50 degrees fahrenheit, the violation must be corrected or the reactor shutdown within 24 hours.

CAUSE

DESCRIPTION:

The cause of the operation in a degraded mode of LCO 4.1.7(a) was the region power oscillations which resulted in Region 28 exceeding the LCO limit by a few degrees for short periods of time.

| The temperature fluctuations affected the nuclear channels, region outlet temperatures, and steam generator module temperatures. During fluctuations, however, the total core coolant flow and core thermal power remained essentially constant.

| A comprehensive program to evaluate and resolve the power oscillations and temperature fluctuations was begun in late 1977. The program revealed that small (approximately 0.10 inch) lateral movements of fuel columns caused changes in gap distribution, helium crossflow, and (for the seven northwest boundary regions, Regions 20 and 32 through 37) changes in the amount of cool transverse helium flow along the sleeves surrounding the region outlet temperature thermocouples.

CORRECTIVE

ACTION:

The corrective action for the excess region outlet temperature of region 28 was to reduce reactor power, which in turn reduced the magnitude of the region power oscillations and brought Region 28 into compliance with LCO 4.1.7(a).

| Core region constraint devices (RCDs) were installed in November, 1979. These mechanical links limit the small lateral movements of fuel columns to which the fluctuations were attributed. Fluctuation testing up to 100% power with the RCDs installed was completed in November, 1981, and clearly demonstrated that the RCDs were successful in inhibiting the oscillations or fluctuations. The results of these tests were formally submitted to the Nuclear Regulatory Commission in July, 1982.

| On October 5, 1982, the Nuclear Regulatory Commission issued Amendment No. 28 to the Fort St. Vrain Operating License. In this amendment, the Nuclear Regulatory Commission concluded, based upon a review of the test data submitted in July, 1982, that the fluctuation issue is resolved.

| No further corrective action is anticipated or required.

TABLE 1

Time	Core Average Outlet Temperature	Maximum Region Outlet Temperature Allowed By LCO 4.1.7(a)	Region 28 Outlet Temperature
1503	1281	1331	1312
1508	1283	1333	1314
1514	1285	1335	1314
1519	1287	1337	1317
1524	1288	1338	1316
1530	1289	1339	1319
1535	1289	1339	1317
1541	1287	1337	1317
1546	1287	1332	1317
1550	1282	1332	1306
1552	1282	1332	1306
1555	1280	1330	1296
1557	1280	1330	1294
1558	1280	1330	1301
1601	1273	1323	1309
1606	1268	1318	1317
1607	1268	1318	1318
1610	1262	1312	1315*
1615	1261	1311	1312*
1616	1261	1311	1312*
1619	1261	1311	1309
1621	1261	1311	1313*
1626	1261	1311	1297
1627	1261	1311	1300
1630	1261	1311	1297
1635	1250	1300	1294
1641	1259	1309	1306
1642	1265	1315	1311
1644	1265	1315	1315
1646	1265	1315	1310
1651	1247	1307	1310*
1657	1267	1317	1319*
1658	1267	1317	1320*
1702	1259	1309	1313*
1705	1259	1309	1312*
1710	1262	1312	1314*
1715	1257	1307	1314*
1720	1258	1308	1307
1722	1258	1308	1307
1748	1254	1304	1294

*Indicates region outlet temperature in excess of applicable limit of LCO 4.1.7(a).

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