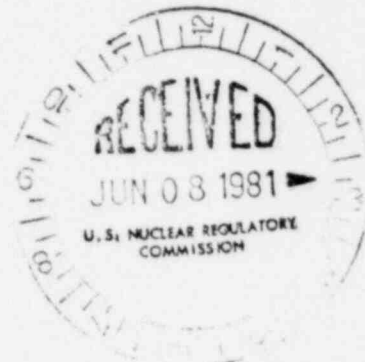




# Public Service Company of Colorado

16805 ROAD 19½  
PLATTEVILLE, COLORADO 80651

May 27, 1981  
Fort St. Vrain  
Unit No. 1  
P-81154



Mr. Karl V. Seyfrit, Director  
Nuclear Regulatory Commission  
Region IV  
Office of Inspection and Enforcement  
611 Ryan Plaza Drive  
Suite 1000  
Arlington, Texas 76012

Reference: Facility Operating License  
No. DPR-34

Docket No. 50-267

Dear Mr. Seyfrit:

Enclosed please find a copy of Reportable Occurrence Report No. 50-267/81-033, Final, submitted per the requirements of Technical Specification AC 7.5.2(b)2.

Also, please find enclosed one copy of the Licensee Annual Report for Reportable Occurrence Report No. 50-267/81-033.

Very truly yours,

*Don Warembourg*  
Don Warembourg  
Manager, Nuclear Production

DW/clb

Enclosure

cc: Director, MIPC

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REPORT DATE: May 27, 1981  
OCCURRENCE DATE: April 27, 1981

REPORTABLE OCCURRENCE 81-033  
ISSUE 0  
Page 1 of 4

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

REPORT NO. 50-267/81-033/03-L-0

Final

IDENTIFICATION OF  
OCCURRENCE:

A malfunction of a helium circulator speed modifier caused loss of 1C helium circulator Plant Protective System function of high speed trip. This resulted in operation under a degraded mode permitted by LCO 4.4.1, Table 4.4-3, and is reportable per Fort St. Vrain Technical Specification AC 7.5.2(b)2.

EVENT  
DESCRIPTION:

While operating at 30% thermal power and 70 MW electrical power, Operations personnel observed that one of three channels for the 1C circulator speed protection tripped on low speed while the circulator was operating at approximately 4500 rpm.

This resulted in loss of the speed signal and trip capability in one of the three associated high speed trip channels for the 1C circulator. The two redundant channels were available and operable.

See Figure 1. The speed modifier (SM), ②, is designed to measure the rotational speed and alignment wobble of the helium circulator shaft. This is accomplished by the use of a reluctance type detector probe (SE), ①, connected to a phase sensitive carrier type electronics system.

Precision machined slots in the rotating shaft of the helium circulator provide timing pulses whose frequency is proportional to shaft rotational speed.

The electronic system which produces this signal operates on the principle of a balanced bridge connected to probes consisting of two identical coils. In normal operation, the bridge is nulled for minimum zero phase shift output with the rotating shaft centered in the bearing.

Three separate channels monitor the speed of each helium circulator. The pulse signals are transmitted by the SM's, ②, to the speed transmitter (ST), ③, which produces a 0 to 10 volt output signal proportional to shaft RPM for use in the summer modifiers and process

trip modules. The procedure trip modules are the speed switches low (SSL), (4), and speed switches high (SSH), (5). If the circulator speed reaches either the high or low trip setting, the SSL's or SSH's initiate trip signals to the two of three solid state logic, which produces a circulator shutdown via the special control relays (XCR's).

CAUSE  
DESCRIPTION:

The speed modifier malfunction was due to a bridge unbalance caused by a change in resistance between the two leads of the cable from the speed element (1) to the speed modifier (2).

CORRECTIVE  
ACTION:

An installed spare speed element and cable were connected to the speed modifier, and the modifier was balanced, restoring the overspeed protection to the affected channel.

Nuclear Projects Department is analyzing the problem to determine if new cables should be run from the terminal box at the circulator to the Control Room.

No further corrective action is anticipated or required.



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