**Public Service Company of Colorado**

16805 ROAD 19½
PLATTEVILLE, COLORADO 80651

February 17, 1981
Fort St. Vrain
Unit No. 1
P-81056

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. 50-267/81-013, Final, submitted per the requirements of Technical Specification AC 7.5.2(a)2.

Also, please find enclosed one copy of the Licensee Event Report for Reportable Occurrence Report No. 50-267/81-013.

Very truly yours,

Don Warembourg
Manager, Nuclear Production

DW/cls

Enclosure

cc: Director, MIPC

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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

REPORT NO. 50-267/81-013/01-T-0

Final

IDENTIFICATION OF OCCURRENCE:

On Tuesday, February 3, 1981, at 1115 hours, it was determined that the concentration of tritium in an unrestricted area following liquid waste release number 429, which was made on January 23 and 24, 1981, exceeded the limit specified in LCO 4.8.2(a). At the time of the occurrence, the reactor was operating at approximately 46% thermal power and 130 MW electrical.

This event is reportable per Fort St. Vrain Technical Specification AC 7.5.2(a)2.

CONDITIONS PRIOR TO OCCURRENCE:

The conditions prior to occurrence or at the time of reportability determination are not germane to this report.

DESCRIPTION OF OCCURRENCE:

During an analysis by plant personnel of the results of samples associated with radioactive liquid waste release number 429, it was determined that the concentration of tritium in an unrestricted area exceeded the limit specified in LCO 4.8.2(a).

Refer to Figure 1. Effluents from the reactor building sump ( (A) ) and the liquid waste system ( (B) ) are discharged to a common line ( (C) ) leading to the Goosequill Ditch ( (D) ). Circulating water blowdown ( (E) ) is admitted for dilution purposes prior to the effluent reaching the Goosequill Ditch. Radiation monitors RIS-6212 and RIS-6213 ( (1) and (2) ) in the common discharge line alarm at preset values on high activity in effluent discharged from either the reactor building sump or the liquid waste system and provide a signal to trip the liquid waste transfer pumps ( (3) ), close HV-6212 ( (4) ), and if the release is from the reactor building sump, close HV-7204-2 ( (5) ), thus terminating the release.

DESCRIPTION OF
OCCURRENCE: (Cont'd)

Circulating water blowdown flow is monitored by flow switch FSL-4101 ( (6) ) and at a preset value of low blowdown flow provides a signal to close HV-6212 and to trip the liquid waste transfer pumps and reactor building sump pumps ( (7) ) ( a on Figure 1).

Under normal conditions, discharge from the reactor building sump (System 72) is at a flow rate less than or equal to 10 gpm. However, discharges at a rate in excess of 10 gpm (up to a maximum of approximately 50 gpm with one reactor building sump pump in service) can be made, provided the sump contents are previously analyzed to assure compliance with LCO 4.8.2 and 4.8.3. Flow rate is then increased by opening a bypass ( (8) ) in parallel with the radiation monitors. Under these conditions, a proportionate sample flow continues to pass through the radiation monitors to provide a means for termination of the release on high activity by closing HV-6212 and HV-7204-2 and directing the effluent to the liquid waste system via HV-7204-1 ( (9) ).

Releases from the liquid waste system (System 62) are governed by the requirements of Technical Specification LCO 4.8.2. Prior to release, a maximum discharge rate is established based on radionuclide concentrations in the liquid waste effluent. Based on the calculated release rate, it may be necessary to increase the blowdown flow to greater than the nominal 1100 gpm to provide sufficient dilution to assure that radionuclides in concentrations greater than MPC are not released to unrestricted areas. It may also be necessary to change the trip setpoints of the radiation monitors or to reduce the allowable release rate to assure that the discharge is within the specified limits.

However, the design of the liquid waste system did not take into account the effects of an oil separator ( (10) ) in the discharge line common to the reactor building sump and liquid waste discharge system. The oil separator has a capacity of approximately 3200 gallons; the normal volume of a liquid waste release is in the range of 2200 to 2300 gallons. As detailed in Reportable Occurrence 80-52, it is conceivable that a good portion of the volume of a liquid waste release could be held up in the oil separator downstream of the monitoring equipment.

Furthermore, if a release from the reactor building sump were to be made following a liquid waste release at a release rate higher than that allowable for the liquid waste release, the radioactive liquid which had been held up in the oil separator would be released at an unacceptable release rate. This higher release rate would result in a smaller dilution factor than originally calculated for the liquid waste release. This reduced dilution could result in discharges to the unrestricted area in excess of the allowable radionuclide concentrations contained in LCO 4.8.2(a).

DESCRIPTION OF
OCCURRENCE: (Cont'd)

In order to ensure against a possible violation of the limits of LCO 4.8.2(a) as a result of the above-mentioned circumstances, Deviation #80-445 to Surveillance Procedure SR 5.8.2bc-M, "Radioactive Liquid Effluent System Instrumentation Functional Test" was prepared and was subsequently approved by the Plant Operations Review Committee on October 10, 1980. This deviation calls for initiating a 6000 gallon release from the reactor building sump immediately after terminating a liquid waste release. (See corrective action #1 of RO 80-52.) The release rate from the sump is to be less than or equal to the release rate authorized for the liquid waste release. This procedure has been followed on liquid waste releases made subsequent to October 10.

In addition to the above flush of the oil separator, on October 21, 1980, an order was placed in the Health Physics Order Book calling for the collection of cooling tower blowdown samples once per two hours during the last half of the liquid waste release and for the entire duration of the reactor building sump release (see corrective action #2 of RO 80-52).

Liquid waste release number 429 was initiated at 1911 hours on January 23, 1981. The recommended release rate was 3.0 gpm, with a cooling tower blowdown (dilution) rate of 2300 gpm. Subsequent analysis indicated a calculated average release rate of 1.5 gpm and a calculated average blowdown rate of 2548 gpm. The 6000 gallon reactor building sump release was begun at 1920 hours on January 24, 1981, and secured at 0220 hours on January 26, 1981. The reactor building sump flow rate was adjusted by operations personnel so that the sump flow rate recorder, FR-7216, read approximately 3 gpm.

Health physics personnel collected liquid samples per the Health Physics Order during the liquid waste release and on an hourly basis during the subsequent reactor building sump release. Analysis of the samples taken during the sample release indicated the following results:

| Sample Date/Time | Sample Number | $^{3}H$ µCi/cc |
|---|---|---|
| 1-23-81/1910 | RC 17358 | 1.25E-4 |
| 1-23-81/2010 | RC 17359 | 2.90E-3 |
| 1-23-81/2110 | RC 17360 | 3.39E-3* |
| 1-23-81/2210 | RC 17361 | 3.29E-3* |
| 1-23-81/2310 | RC 17362 | 3.57E-3* |
| 1-24-81/0010 | RC 17363 | 3.23E-3* |
| 1-24-81/0111 | RC 17364 | 1.48E-3 |

The results of subsequent samples indicated compliance with LCO 4.8.2(a).

*Results in excess of LCO 4.8.2(a) $^{3}H$ limiting concentration in an unrestricted area (3.0E-3 µCi/cc).

DESCRIPTION OF
OCCURRENCE: (Cont'd)

It should be noted that the samples indicating a concentration of tritium exceeding the limit of LCO 4.8.2(a) were taken from the Goosequill Ditch, considered to be in the unrestricted area although located on Public Service Company of Colorado property. The Goosequill Ditch flows into a 25 acre farm pond, also on Company property, the overflow of which drains into the South Platte River. The additional dilution provided by the pond ensures that the concentration of liquid flowing into the South Platte River is within the limits of LCO 4.8.2(a).

APPARENT CAUSE
OF OCCURRENCE:

The design of the Fort St. Vrain liquid waste discharge system was inadequate to preclude problems of this nature from arising.

ANALYSIS OF
OCCURRENCE:

Deviation #80-445 to Surveillance Procedure Number SR 5.8.2bc-M was written in October, 1980, to address the concerns raised in Reportable Occurrence RO 80-52 with respect to the possibility of exceeding the limits of LCO 4.8.2(a), concentrations of radioactive liquid in an unrestricted area. The deviation calls for a 6000 gallon flush of the oil separator in the discharge line common to the reactor building sump and liquid waste discharge systems, following a radioactive liquid waste release, at a rate less than or equal to the recommended liquid waste release rate.

Following liquid waste release number 429, operations personnel correctly followed the requirements of SR 5.8.2bc-M and left HV-6212 ( (4) ) in the open position. Upon initiation of the reactor building sump release, operations personnel again correctly followed SR 5.8.2bc-M and attempted to control the release rate by throttling the controller for HV-6212, HC-6212, located on the 4771' elevation of the Reactor Building, by hand, while a Reactor Operator in the Control Room observed the flow rate meter FR-7216. FR-7216 is a linear flow rate recorder with a range of 0 - 125 gpm, incremented by 2.5 gpm. Accurate confirmation of a small (less than 5 gpm) release rate using FR-7216 is not possible. An analysis of the FR-7216 recorder subsequent to the occurrence confirmed that no useful information can be obtained for release rates less than 5 gpm. FIQ-7216 indicated an hourly average flow rate from the sump of 1.2 gpm from 1910 to 2010 hours on January 24, 1981, and an hourly average of 1.9 gpm from 2010 to 2110 hours. The fact that the results of the liquid sample taken at 2110 hours on January 24, 1981, indicated a concentration of tritium in excess of LCO 4.8.2(a) limits, shows that spikes in reactor building sump flow rates existed in the early stages of the sump release. FR-7216 and FIQ-7216 are inadequate to ensure a low (less than 5 gpm) release rate from the reactor building sump using the 50 gpm sump pumps. This inability to accurately establish the 3.0 gpm allowable release rate from the reactor building sump contributed to exceeding the limit of LCO 4.8.2(a).

CORRECTIVE ACTION:

1) Liquid waste releases from Fort St. Vrain were immediately suspended upon discovery of the occurrence. The suspension was effective until definitive corrective action was taken to prevent recurrence.

2) Change Notice 1299 was approved and issued. The Change Notice provides for the installation of a bypass around the oil separator to be utilized during a liquid waste release. Installation was completed on February 8, 1981.

3) The liquid waste system operating procedure and associated surveillance requirement were revised to remove the 6000 gallon reactor building sump release and provide for the use of the oil separator bypass. The remaining dead leg in the liquid waste discharge system piping, approximately 150 gallons, is to be flushed with clean water subsequent to liquid waste releases, at the recommended liquid waste release rate.

No further corrective action is anticipated or required.

FAILURE DATA/SIMILAR REPORTED OCCURRENCES:

Reportable Occurrence 80-52 and Reportable Occurrence 80-67 deal with related subject areas.

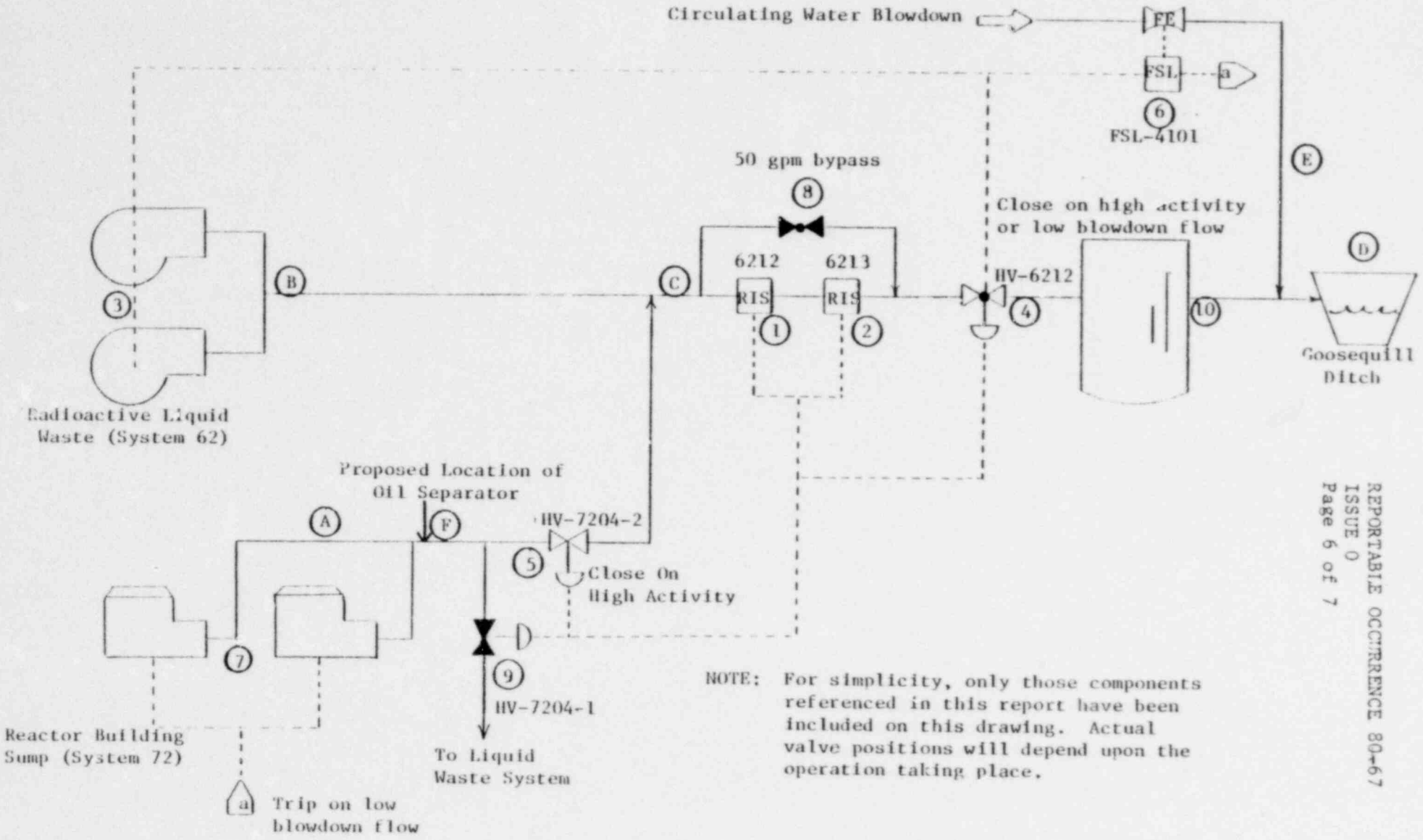
PROGRAMMATIC IMPACT:

None

CODE IMPACT:

None

FIGURE 1




NOTE: For simplicity, only those components referenced in this report have been included on this drawing. Actual valve positions will depend upon the operation taking place.

REPORTABLE OCCURRENCE 80-67
ISSUE 0
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Prepared By: Frederick A. Borst
Frederick J. Borst
Senior Plant Engineer

Reviewed By: M J Harris for
J. W. Gahm
Technical Services Supervisor

Reviewed By: M.M. Lloyd, Jr. for
Frank M. Mathie
Operations Manager

Approved By: M.M. Lloyd, Jr. for
Don Warembourg
Manager, Nuclear Production