

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

IE Inspection Report No. 50-267/79-15

Docket No. 50-267

License No. DPR-34

Licensee: Public Service Company of Colorado
P. O. Box 840
Denver, Colorado 80201

Facility Name: Fort St. Vrain Nuclear Generating Station

Inspection At: Fort St. Vrain Site, Platteville, Colorado

Inspection Conducted: September 29 - October 26, 1979

Inspector:

T. F. Westerman for
M. W. Dickerson, Reactor Inspector

11-6-79
Date

R. Spangler for
R. Smith, Reactor Inspector

11-7-79
Date

Robert Spangler for
S. R. Dean, Reactor Inspector

11-7-79
Date

Approved By:

T. F. Westerman
T. F. Westerman, Chief, Reactor Projects
Section

11-6-79
Date

Inspection Summary

Inspection September 29 - October 26, 1979 (Report No. 50-267/79-15)

Areas Inspected: Routine, announced inspection of design changes and modifications; maintenance; physical security; plant operations; training; requalification training and follow-up on inspector identified and unresolved problems. The inspection involved 157 inspector-hours on-site by three (3) NRC inspectors.

Results: One item of noncompliance relative to the failure to make proper valve lineups as required by procedure and failure to issue a Plant Trouble Report as required by procedure (paragraphs 2a and 2b).

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128

DETAILS1. Persons ContactedPublic Service Company of Colorado

D. Alexander, Senior Health Physicist
G. Billings, Shift Supervisor Operations
L. Brey, QA Manager
M. Ferris, Engineer Technical Services
W. Franek, Results Supervisor
W. Franklin, Shift Supervisor Operations
J. Gamm, Supervisor Technical Services
C. Holland, Lead Security Officer
D. Hood, Shift Supervisor Operations
T. Howard, Superintendent Operations, QA
J. Liebelt, Maintenance Supervisor, electrical
F. Mathie, Operations Manager
G. Reigel, Shift Supervisor Operations
T. Schleiger, Health Physicist
J. Solakiewicz, QA Engineer
G. Turner, Supervisor of Security
D. Waremborg, Manager, Nuclear production

The inspectors also contacted other plant personnel, including reactor operators, maintenance men, electricians, technician, and administrative personnel.

2. Plant OperationsA. Review of Plant Operations

A review of plant operations was conducted to ascertain whether facility operation was in conformance with the requirements established in 10 CFR, Technical Specifications, administrative procedures or licensee commitments discussed in correspondence to the NRC.

The inspectors reviewed plant operating logs and records, discussed plant operation with management and shift personnel, observed routine plant operation from the control room and within the plant, and toured accessible areas of the plant.

Below is a list of the operational logs and records reviewed:

Shift Supervisor's Log (July 11, 1979 - October 19, 1979).

1665 277

Technical Specification Compliance Log (July 11, 1979 - October 19, 1979).

Surveillance Logs 1-4 (July 11, 1979 - October 19, 1979)

Form 1 Log (jumper log)

Plant Trouble Report

The inspectors toured accessible areas of the plant paying particular attention to the following:

Monitoring Instrumentation

Radiation Controls

Housekeeping

Fluid Leaks

Piping Vibrations

Hanger/Seismic Restraints

Clearance Tags

Annunciators

Control Room Manning

During this aspect of the inspection the inspectors noted several discrepancies as discussed below:

- (1) Snubber HRS-194 was found to be inoperable due to low reservoir oil level. The snubber was subsequently returned to service by the licensee within Technical Specification limitations.
- (2) On October 1, 1979 lock wires were found missing from valves V11302 and V11652. The overall plant operating procedure Section B contained the Sealed Valve List which was completed September 13, 1979 specifying that these valves were in a locked open position. The licensee, after notification by the resident inspector, sealed the valves in the open position as required by O.P.O.P I Section B.

- (3) On October 2, 1979 valves V11138, V11139, and V11140 were found to be closed while System Operating Procedure 11, Revision 8, requires that these valves be in the open position. The licensee, after notification by the resident inspector, repositioned these valves to open as required by SOP 11, Revision 8.

The licensee's failure to verify that valves required to be sealed open are in fact locked open and failure to verify that valves are in their proper position in compliance with approved procedures is considered an item of noncompliance. The item of noncompliance being failure of plant operating personnel to follow approved operational procedures. Since the inspectors verified that valves V11302 and V11652 were lock wired open and valves V1138, V11139, and V11140 were open, the licensee's response to these items need only address the corrective steps which will be taken to avoid further noncompliances.

B. Circulator Buffer Helium System Upset.

(1) Introduction

On October 14, 1979, at approximately 0700, a Circulator Buffer Helium System upset occurred which resulted in the release of contained helium to the reactor building and subsequently to the stack. The activities preceding the release as determined from review of logs, instrument, charts, records and discussion with personnel were as follows.

(2) Activities Preceding and During Release

The reactor was operating at 63% power with all systems indicating normal. At 0315 the buffer helium dryer swapped from "A" to "B" Tower and Cross-Tower leakage was indicated by an increase in the low pressure separator pressure. At 0400, power reduction was begun in preparation for bypassing the buffer helium dryer to prevent moisture/oxidant problems within the reactor. This reduction in power continued until 0600 at which time the reactor power was 50%.

At 0630 the buffer helium supply and return flows were reduced and the buffer helium dryer was bypassed. Isolation of the dryer was completed at approximately 0645. Upon completion of the isolation, simultaneously the vent valve on the dryer knock-out pot line and the dryer bypass block valve were opened and closed respectively. Then PDV-2367-2 (buffer helium from purification system) and PDV-23111 (purified helium to PCRV) and FV-2339 (Purified Helium Compressor recirculation flow) both

began to hunt. PDV-2367-2 was hunting through its full cycle. There valves were placed in manual control in an attempt to stop the hunting but the system did not stabilize and the valves were then returned to automatic control.

At 0649 the buffer supply to "A" circulator was placed in manual to stabilize the flow. "A" circulator tripped shortly afterward on buffer-mid-buffer high at 80 inches water. The brake and seal were automatically set. "D" circulator also tripped on buffer-mid-buffer high two minutes later and the brake and seal were automatically set. Five minutes later (0656) all buffer helium supply was lost due to tripping of the purified helium compressor. This has been attributed to cycling of PDV 2367-2 and PDV-23111 which either carried a low purified helium flow or a higher compressor differential. The standby purified helium compressor also did not start since it was inhibited if the purified helium compressor differential is greater than 10 psid. Repeated attempts to start the compressor were not successful. During this time (since the failure of the buffer helium supply until approximately 0658) primary coolant was coming down the shafts of "B" and "C" circulator and entering the circulator auxiliaries.

When the purified compressors would not stay on (0700), the high pressure helium bottles were valved opened to supply buffer helium. This did not appear to re-establish a stable supply and the high pressure bottles were secured.

At 0705 the inlet block valve to the dryer bypass was opened and the vent valve on the dryer knockout pot line was closed which returned the buffer helium lineup to normal, except that the dryer was being bypassed. Three minutes later the purified helium compressor was started and the buffer helium supply and return stabilized for "B" and "C" circulators.

At 0700 the reactor power was down to 39.7%. By 0720 reactor power had reached 26% power and was being further reduced to less than 2%. At 1130 the helium dryer was returned to service utilizing "B" tower. The reduction in reactor power continued until 1300 at which time it had been reduced to 1.9%.

(3) Discharge Paths

a. To Reactor Building

Contaminated water in the low pressure separators caused RT-21251 (See section 2.B.(3)c) to trip, stopping the

bearing water removal pumps and diverting low pressure separator drains to the liquid waste sump via a 1 inch drain line. The liquid waste sump was pumped to the liquid waste tank. Because the draining capacity via the 1 inch line is limited, the level in the low pressure separator began to increase, causing gas in the low pressure separator to compress and lift the interstage reliefs on the RIX compressor at approximately 15 psig. This released contaminated helium to the reactor building. Persons in the area observed the TRITON monitor respond as the RIX interstage reliefs lifted.

b. To the Stack

It is not known for certain if the low pressure separator gas relief lifted at the setpoint of 50 psig, since at this time the relief is temporarily vented to the reactor building stack. The low pressure separator is in a common line with the helium dryer outlet knockout pot which also has a 50 psig relief. This relief valve also relieves through a temporary line to the reactor building stack. The possible pressurization path of the low pressure separator would be from the purge line from the buffer helium dryer as follows:

- . When the buffer helium dryer swapped from tower "A" to tower "B", the "B" tower purge valves shut (HV-21348 and HV-21352). Leakage past the seat of HV-21352 flowed through cooler E-2102X to the dryer knockout pot, and then to the low pressure separator increasing the low pressure separator pressure.
- . These leakage paths were occurring since low pressure separator pressure indication is one of the methods that is used to verify cross-tower leakage and was verified in the control room. It was also noted that at about 0630 RT-31193, on the steam jet air ejector began to increase, indicating contaminated low pressure separator water. This increase slowly continued until the low pressure separator drains were directed to the liquid waste sump at about 0700.
- . Helium/water discharged from the circulator to the high pressure separator, to the buffer helium recirculators, through vent valve V-211413 (vent valve on dryer knockout pot line) to the reactor building stack.

c. Radiation Monitoring Instrument Reading

<u>Instrument</u>	<u>Time</u>	<u>Highest Count</u>	<u>Alarmed & (Set point)</u>	<u>Location</u>
21251	0700	10^5	Yes (10,000)	Low Pressure Separator drain to liquid waste sump
2263	0700	2000	Yes (600)	Pump low pressure separator to deaerator
2264	0700	300	No (570)	Pump low pressure separator deaerator
6212	0700	500	No (1,050)	Dissolved noble gases
6213	0700	900	Yes (800)	Dissolved noble gases
31193	0700	800	Yes (500)	Pump low pressure separator to deaerator

(4) Radiological Considerations

- a. Noble gas release from the stack as calculated from indication on the "Ping" monitor of 1,300 cpm was 60.4% of the Technical Specification limit and Iodine 131 as calculated from the stack charcoal filter cartridges was $1.06\text{E}-5\%$ of the Technical Specification limit.
- b. The maximum concentration in the reactor building as recorded on the constant air monitor located at elevation 4740 was $4.15\text{E}-8$ microcuries/cc.
- c. Environmental sampler analyzed on October 16, 1979 showed no significant activity above background.
- d. A calculation of the maximum dose received by any one individual during the release indicated a total dose equal

to 6.38E-1 mR. Additionally the pocket dosimeter worn by this individual during this period showed 0 mR.

(5) Recommendations and Corrective Action

- a. A review of plant drawing P&I 21-3 by the licensee indicated omissions.
- b. Noted by both the inspector and the licensee was the need to provide continuous recording for radiation monitoring instrumentation (presently plots each point at 5 minute intervals).
- c. Hard pipe in pressure relief valves to the reactor building stack.
- d. The model verification computer currently rewinds the disc every 24 to 26 hours and erases. Extra discs should be provided for daily changing.
- e. Noted by both the inspector and the licensee was a means of providing isolation of the quench water to low pressure separator or providing increased draining capacity.

The above problems and other means of preventing the buffer helium upset are being investigated by PSC engineering. The results will be incorporated in Change Notice No. 990 which will be installed during the next outage currently scheduled to start October 26, 1979.

(6) Findings

An item of noncompliance was identified by the inspector during the initial review of the "Ping" monitor, RT 4801, 4802 and 4803 in that recorder RR 4801 for the monitor was not operating at the time of the release. Review of the recorder chart indicated that the recorder had not been working since September 22, 1979, although the chart had been moved ahead each day, dated and the instrument checked with the source. A check of the PTR's issued indicated that no PTR had been issued for this problem, although discussions with several of the licensee's personnel indicated that they believed that there was a long standing PTR on the recorder which had not been closed out. A check of this did not indicate there was a PTR outstanding (see section 3).

The failure to write a PTR is contrary to the requirements of Administrative Procedure No. 28, section 3.2, which states

in part that "When the person responsible . . . if the recorder or integrator is not working properly, write a plant trouble report (PTR)." Section 5.2 contains a list of recorder charts and those responsible personnel in attachment 5.2. On page 22 of their attachment is listed RR 4801. The licensee was informed that failure to write a PTR was considered an item of noncompliance.

The failure of the recorder resulted in there being no chart record of the radiation activity released versus time over the period when the reading of 1300 cpm was encountered. This made it difficult to estimate immediately the magnitude of the release. The same difficulty was noted in the use of other radiation monitoring instruments which are now provided with a once every 5 minute recording. Although in the latter case RT-7324-1, stack monitor noble gases, was noted to trip (Trips at 77,000 cpm) within 30 seconds. The reactor operator walked to the instrument recorder and observed that it was reading less than 100 cpm and reset the monitor. This resulted in a very conservative initial estimate of the release by the licensee.

3. Maintenance

The inspector reviewed selected maintenance activities to determine that these activities met acceptable maintenance practices, the licensee's applicable administrative and maintenance procedures, and where applicable were in accordance with Technical Specification. Additionally, the inspector observed portions of maintenance activities to verify that procedural requirements were met, personnel were qualified, and QC hold points were provided. Tagging procedures were observed by the inspector as appropriate and no reportable occurrences were identified.

The maintenance activities reviewed were:

PTR-10-282 Repair of HV-21352

PTR-8-649 Chart not running

WA-783-98 Modification of Hanger 11A-H-46890

The repair to HV-21352 (the leaking valve in the helium dryer on 10/14/79) was completed on October 15, 1979. A review of the maintenance history for this valve indicated that the teflon disc had been replaced eight times (2/16/77, 1/30/78, 6/16/78, 12/24/78, 1/4/79, 1/27/79, 10/5/79 and 10/15/79). Discussions with a representative of the licensee indicated that the last two failures were identical in that the disc had a portion of it broken out. A discussion with the licensee on the

maintenance history of this valve indicated that replacement of the valve is long-term (lead time is approximately 1 year) and that splitting of the helium circulator auxiliary system is scheduled to be completed by January 1, 1981. However, the licensee in looking into the reasons for the differences in the maintenance histories of two of the same types of valves used in the helium dryer. The other valve, HV-21350, used for the same purpose as HV-21352 has had a relatively maintenance free history, the tefton disc being replaced only on two occasion, February 16, 1977 and November 17, 1977. Additionally, the licensee has indicated that a trend analysis type of equipment history will now be utilized to try to avoid equipment failures of this type.

Malfunction of the recorder on the "Ping" monitor RR4801 (See additional information under Section 2B) was reported on PTR-8-649. Observation of the chart made for four consecutive days, August 31 - September 3, 1979, indicated that the recorder was operating properly. The PTR was signed off on September 4, 1979 as completed.

The Work Authorization (WA-783-98) for repair of hanger 11A-H-46890 which had been declared impaired under the provisions of IE Bulletin 79-02 was repaired (installed new base plate) within the 72 hour Technical Specification provision and the hanger was considered no longer impaired. The base plate for this hanger was found to have a missing anchor bolt and was pulled away from the wall.

4. Design, Design Changes and Modifications

The inspector reviewed the licensee's administrative procedures for control of design, and design change and modification implementation. The following is a list of Change Notices (CNs) that were selected for review:

- CN 251 Installation of Unloaders on Three Instrument Air Compressor and One Service Air Compressor.
- CN 263 Install Supports for Pressurized Gas Bottles to Reduce Missile Hazzards.
- CN 449 Remove Solenoid Valve to Reduce Failure Probability of Overheating Diesel.
- CN 457 Add Manual Isolation Valves to Prevent Radioactive Leakage from Recirculator Inlet Piping.
- CN 677 Install Snubber 22/MSS 248.
- CN 703 Change Design of Circuit Breaker for Alternate Cooling Method System to Prevent Trip on System Startup.

- CN 784 Relocate TSH 93448 - to reduce Temperature Error.
- CN 957 Installation of Shielding on Reactor Top Head Area to Reduce Radiation Streaming. This change notice is still in review and has not been approved.

The sample of design changes reviewed indicated that they were controlled in accordance with procedures, and that they were reviewed, approved and verified by acceptance tests where necessary. These design changes were evaluated as required by 10 CFR 50.59. Procedures and drawings were reviewed and revised where necessary.

During a review of Plant Trouble Report No. 9-272 dated September 15, 1979, entitled Wide Range Channel V, it was determined that the actual work performed was not specified by this plant trouble report, nor was it documented. From interviews with technicians involved with the repairs of the Channel V Wide Range Nuclear Instrumentation, the inspector determined that the actual repair and testing was accomplished satisfactorily. The Administrative Procedure for the use of the plant trouble report/work requests form does not clearly define requirements for identifying the repair and testing method/procedure to be utilized. In discussions with plant management it was stated that this procedure would be revised by January 1, 1980. This item will remain open pending procedure revision.

No items of noncompliance or deviations were identified.

5. Review of Licensee Event Reports

The inspector verified that licensee event reporting activities were in accordance with Technical Specification, Section 7, including identification details, corrective action, review and evaluation of aspects relative to operations and accuracy of reporting.

The following reports were reviewed by the inspector:

U.E. 76-08	R.O. 79-17
U.E. 76-09	R.O. 79-20
A.O. 76-19	R.O. 79-21
R.O. 77-14	R.O. 79-23

1665 286

R.O. 79-15

R.O. 79-24

R.O. 79-16

No items of noncompliance or deviations were identified.

6. Training

The inspector verified by direct questioning of licensee personnel and by attendance at selected training lectures that the training required by the Technical Specifications or the licensee's commitments is being performed. However, as a result of the discussions with licensee personnel it appears that training in the area of administrative procedures is inadequate. This matter was discussed with the licensee who indicated that this had been recognized and that plans were being formulated for a revision to the training program concerning administrative procedures. This matter remains as an open item.

7. Requalification Training

The inspector attended selected training lectures and witnessed control manipulation to verify the content of the information presented and to determine the sufficiency of the control manipulation.

No items of noncompliance or deviations were identified.

8. Physical Protection

The inspector reviewed portions of the licensee's physical protection program by review of selected records and observation of the activities of access control, search, escorting, and communications.

No items of noncompliance or deviations were identified.

9. Exit Interviews

Exit interviews were conducted at the end of various segments of this inspection with Mr. D. Warembourg (Manager, Nuclear Production) and other members of the Public Service Company staff. At the interviews, the inspector discussed the findings indicated in the previous paragraphs. The licensee acknowledged these findings.

1665 287