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

IE Inspection Report: 50-267/81-11 License DPR-34

Docket: 50-267

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

Facility Name: Fort St. Vrain Nuclear Generation Station

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

Inspection Conducted: May 1-31, 1981

Inspectors: for D M Hunnicutt 6/24/81
M. W. Dickerson, Senior Resident Reactor Inspector Date

for D M Hunnicutt 6/24/81
G. L. Plumlee, III, Resident Reactor Inspector Date

Approved By: for D M Hunnicutt 6/24/81
T. F. Westerman, Chief, Reactor Project Section No. 1 Date

Inspection Summary

Inspection conducted on May 1-31, 1981 (Report: 50-267/81-11)

Areas Inspected: Routine, announced inspection of surveillance; maintenance; operational safety verification; plant operations; preparation for refueling; refueling activities; plant trips-safety system challenges; IE Bulletin Follow-up; Followup on previous violations; and review of periodic and special reports. The inspection involved 185 inspector-hours on site by two NRC inspectors.

Results: Within the ten areas inspected, two items of noncompliance were identified (failure to adhere to Technical Specification limitations, paragraph 3.A.; and failure to follow a procedural requirement, paragraph 3.B.).

DETAILS

1. Persons Contacted

L. Brey, QA Manager
R. Craun, Senior Engineer
W. Franek, Results Supervisor
J. Gahm, Supervisor Technical Services
W. Franklin, Shift Supervisor
E. Hill, Superintendent of Operation
W. Hillyard, Administrative Services Manager
D. Hood, Shift Supervisor
F. Mathie, Operation Manager
T. Orlin, Superintendent QA Services
L. Singleton, Superintendent Operation QA
J. Vandyke, Shift Supervisor
R. Wadas, Training Supervisor
D. Warembourg, Manager Nuclear Production

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

2. Licensee Action on Previous Inspection Findings

(Closed) Violation (50-267/8103-01): Liquid waste release resulting in release of tritium to unrestricted area in excess of LCO 4.8.2(a) limit of 3.00E-3μCi/cc. The licensee modified the system to provide a bypass around the oil separator for use during liquid releases.

(Closed) Violation (50-267/8103-02): Personnel failed to comply with requirements of RWP. All personnel involved were reprimanded and working foremen and supervisors have been instructed to emphasize RWP requirements in job briefings prior to job commencement and to continue such briefings throughout the job.

(Closed) Violation (50-267/8021-01): Two valves required to be sealed in position were missing locking devices. A new system for assuring valves required to be sealed has been placed in service and confirmed by the NRC inspector.

3. Operational Safety Verification

The NRC inspector reviewed licensee activities to ascertain that the facility is being operated safely and in conformance with regulatory requirements, and the licensee's management control system is effectively discharging its responsibilities for continued safe operation. The

review was conducted by direct obse vation of activities, tours of the facility, interviews and discussion with licensee personnel, independent verification of safety system status and Limiting Conditions for Operations, (LCO), and review of facility records.

Included in the inspection were observation of control room activities, review of operational logs, records, and tours of accessible areas. Logs and records reviewed included:

- Shift Supervisor Logs
- Reactor Operator Logs
- Equipment Operator Logs
- Auxiliary Operator Logs
- Technical Specification Compliance Logs
- Operations Order Book
- System Status Log
- Form 1 Log (Jumper Log)
- Plant Trouble Reports

During tours of accessible areas, particular attention was directed to the following:

- Monitoring Instrumentation
- Radiation Controls
- Housekeeping
- Fluid Leaks
- Piping Vibrations
- Hanger/Seismic Restraints
- Clearance Tags
- Fire Hazards
- Control Room Manning
- Annunciators

The operability of selected systems or portions of systems were verified by walkdown of the accessible portions. Observed was the feedwater heater vent and drain system. Procedures were also reviewed and implementation observed for Gaseous Effluent Releases Nos. 537 and 540. The releases appeared to have been made in a satisfactory manner.

No violations or deviations were identified.

A. Technical Specification LCO 4.8.2(a) - Exceeded

On May 14, 1981, at 1:00 p.m., the licensee reported to the Resident Inspector that the limits of Technical Specification Limiting Condition for Operation (LCO) 4.8.2(a) for the concentration of tritium in an unrestricted area had been exceeded on May 12, 1981. TS 4.8.2(a) states that "The maximum instantaneous release rate of radioactive liquid effluents from the site shall be such that the concentration of radionuclides in the cooling tower blowdown water discharge does not exceed the values specified in Table II, Column 2, 10 CFR Part 20, Appendix B, for unrestricted areas."

The specified release rate was 9.0 gpm at a dilution rate of circulation water blowdown of 2,000 gpm. A subsequent analysis indicated an average release rate of 9.2 gpm and an average dilution rate of 2,496 gpm. However, a special test was performed on release No. 460 to track liquid waste concentrations in the unrestricted area during the course of the release. This consisted of sampling on an hourly basis throughout the release. The analysis run on the sample taken at 1:00 p.m. on May 12, 1981, 25 minutes after start of the release indicated a concentration of tritium of 3.55E-3μCi/cc, in excess of the 3.00E-3μCi/cc specified by LCO 4.8.2(a).

The cause has been attributed to an interruption of blowdown at 12:55 p.m. for approximately two minutes which also caused automatic trip of the liquid waste transfer pump and closing of HV-6216, the liquid waste system isolation valve. This allowed draining of the highly concentrated liquid waste in the piping system downstream of HV-6212 and resulted in an above limits concentration.

The licensee is considering relocating another isolation valve at the junction of the liquid waste discharge line and the circulating water blowdown line to isolate the dead leg until conditions are acceptable for release.

Details on the release are available in the 14-day License Event Report 81-036 dated May 27, 1981.

Additionally, this matter was discussed with the licensee who was informed that failure to meet the requirements of the Technical Specification was a violation (8111-01).

The inspector had no additional questions in this area.

B. Systems Abnormalities Book

During a review of the Systems Abnormalities Book on May 19, 1981, the NRC inspector noted two deviation forms which were initialed by a reactor operator as "equipment normal." However, a check of the System Status Tags Nos. 2196 and 2249, assigned respectively to each of the two forms, showed them to still be in place on the equipment specified on the forms for tagging.

System Status Tag 2196 was assigned to Loop 1 Steam Water Dump Valves HV-2215, V-2213 and HS-2215. System Status Tag 2249 was assigned to the Backup Bearing Water System Valve V-21453, on HC-21417/48 and on HS-21331. A check of these tags by the NRC inspector showed that they were still in place.

Procedure P-2, "Equipment Clearance and Operation Deviation," paragraph 4.2.13, instructs the reactor operator to remove the "Operation Deviation Sheet" from the "Systems Abnormalities Book" and initial the form to indicate the system is normal and paragraph 4.2.14 states that he is to verify all subtags listed on the deviation form have been returned. Additionally, Operations Order 81-01 requires that "the responsible operator will initial the deviation form as indicated when the equipment is normal. Reactor operator will check accountability of subtags on the deviation form, and transfer all paper and tags to shift supervisor."

The review of the deviation forms by the NRC inspector indicated that for System Status Tags 2196, the equipment had been altered on December 19, 1980, and that the equipment was returned to normal on December 16, 1980 (note inconsistency in dates). For System Status Tags 2249, the tag indicated that the equipment was altered on April 18, 1981, and that the equipment was returned to normal on April 30, 1981. A check later in the day on May 19, 1981, indicated that both deviation forms had been initialed to indicate equipment altered with a new date of May 19, 1981.

The matter was discussed with the licensee who was informed that failure to comply with the procedural requirements was a violation (8111-02).

The inspector had no additional questions in this area.

C. High Vibration Turbine Trip

(1) Activities During Event

A high vibration turbine trip occurred on May 13, 1981, at 1:34 p.m. while the reactor was operating at approximately 79% reactor power.

When the turbine tripped, the hot reheat bypass valves opened. However, the low condensate header pressure switch sensed less than 234 psig pressure and in a few seconds tripped the hot reheat bypass valves closed. This plus an unexplained time lag in the opening of the hot reheat electromatics caused the turbine exhaust pressure to increase rapidly. This caused both circulators in Loop 2 to trip on drain malfunction resulting in an automatic Loop 2 shutdown.

The rapidly changing reheat pressures created instabilities in the 150 pound steam header. As a result, the feedwater flow from the steam driven feed pumps began oscillating. Compounding the oscillating feedwater flow problem was a problem with the feedwater flow rate limiter which ramped down at a rate inconsistent with the setting of 0.25%/second.

The reactor operator placed both header pressure controllers in manual position to eliminate the 150 pound header instabilities. The pressure stabilized but at low pressure, which caused the two steam driven feedwater pumps to go into the recirculating mode. The loss of the two steam driven feedwater pumps caused the flow from the motor driven feed pump to increase. Adjustments to the controller helped stabilize the feedwater flow. However, at this time the auxiliary boiler was approaching its high pressure trip point and the pressure was manually relieved. This caused the pressure in the 150 pound header to increase sharply and in turn caused the feedwater from the steam driven feed pump to increase sharply. This sharp increase in feedwater flow resulted in tripping both Loop 1 circulators on low programmed speed and the reactor scrammed from about 17% reactor power on a two loop trouble scram. The ISS switch was then placed in the "low power" position and "B" circulator restarted. This ended a one minute loss of forced circulation. "A" circulator was restarted two minutes later.

An inspection of the turbine-generator has revealed no damage other than loose integral covers on each of the two sixteenth stages of the low pressure turbine. Small portions of five of

the lugs holding the covers in place were missing. Additionally, four diaphragms, two for each of twelfth and thirteenth stages of the low pressure stages were loose. At the end of the report period the licensee was preparing to repair and reassemble the turbine.

(2) Radiological Considerations

At approximately 1:40 p.m. on May 13, 1981, activity was noted to be increasing on all of the high pressure separator monitors. This was attributed to Reactor Coolant being forced down the shaft of one or more of the helium circulators due to a buffer system upset which was caused by the circulator trips.

Air sampling in the Reactor Building was initiated along with constant monitoring of the Reactor Building exhaust stack.

At 2:01 p.m. air samples detected activity in the Reactor Building of 1.7E-9 mCi/cc and access control to the Reactor Building was established. At 2:33 p.m. the air sampling indicated an increase to 4.5E-9 mCi/cc. All persons were removed from the Reactor Building and a respiratory requirement for entry was established. By 3:01 p.m. the activity level had decreased to 2.1E-9 mCi/cc and general access was established.

During this period of time no personnel overexposures occurred nor did any of the stack monitors indicate any release of measurable radioactivity from the Reactor Building.

No violations or deviations were identified.

4. Surveillance (Monthly)

The NRC inspector reviewed all aspects of surveillance testing involving safety-related systems. The review included observation and review relative to Technical Specification requirements. The surveillance tests reviewed and observed were:

SR 5.4.1.2.1.C-M Steam Pipe Rupture (Pipe Cavity) Test

SR 5.4.1.2.2.C-M Steam Pipe Rupture (under PCRV) Test

SR 5.8.1.abc-M Radioactive Gaseous Effluent System Test (Release #537)

SR 5.4.1.1.4.b-M Linear Power Channel Scram Test

SR 5.8.1.abc-M Radioactive Gaseous Effluent System Test (Release #540)

The NRC inspector noted that during the performance on May 14, 1981, of SR 5.4.1.1.4b-M, the low level trip for channel 3, LLT-2 which should trip at 1.93±0.05V corresponding to 6% reactor power. actually tripped at 2.112v. Immediate corrective action was taken by the licensee to recalibrate the power range channel.

No violations or deviations were identified.

5. Maintenance (Monthly)

The NRC inspector reviewed records and observed work in progress to ascertain that the following maintenance activities were being conducted in accordance with approved procedures, Technical Specifications and appropriate Codes and Standards.

PRT 4-382 Repair Hydraulic oil leak on HV-2254 in accordance with MP 91.10, Hydraulic Operator Relief Valve Replacement

PRT 4-383 Repair Hydraulic oil leak on HV-2292 in accordance with MP 91.10

PRT 5-54 Repair Hydraulic oil leak on FV-2206

PTR 5-143 Noise in LP section after turbine trip and during coast down

PTR 5-286 Remove and Replace "B" Circulator C-2102 in accordance with MP 21-15, Helium Circulator Change Out Procedure

PM 21.20 Quarterly Inspection of Helium Recovery Compressor C-2107S "B" Rix

FHP - 4 Refueling

FHP - 7 Non-Routine Fuel Reflector Handling

No violations or deviations were identified.

6. Refueling Activities

The NRC inspector reviewed the licensee's Refueling Procedure FHP-4 and the procedure for Non-Routine Fuel Reflector Handling, FHP-7, to verify technical adequacy and procedure completion prior to handling of fuel in the core. The NRC inspector noted that Task 7B of FHP-4 transferring RCD's between FSC and FHM, as written requires transferring the region constraint devices from the fuel storage cask to the fuel handling machine. The actual transfer should be from the fuel handling machine to the fuel storage cask. The NRC inspector also noted in Task 20B of FHP-4 that a data tape number was incomplete. The licensee stated that deviations to the procedure where necessary would be written and approved prior to performance of the specific evolution.

The NRC inspector also verified ventilation requirements in the fuel storage areas and that the licensee was maintaining good housekeeping in the refueling area.

No violations or deviations were identified.

7. Report Reviews

The NRC inspector reviewed the following reports for content, reporting requirements and adequacy:

Monthly Operating Information Report, March 1981

Monthly Operations Report, March 1981

No violations or deviations were identified.

8. IE Bulletin

The NRC inspector verified by record review, observation and discussion with the licensee, the action taken in response to IE Bulletins.

The following Bulletin was reviewed:

81-02 - Failure of Gate Valves to Close Against Differential Pressure. The licensee has determined that neither the Borg-Warner or Westinghouse valves in question have been purchased or installed at Fort St. Vrain.

No violations or deviations were identified.

9. Review of Plant Operations

The NRC inspector reviewed aspects of facility operations to determine if they were being accomplished in accordance with regulatory requirements.

A. Procurement and Storage

The NRC inspector reviewed the following purchase orders, receipt records, storage and certification records. Additionally, observation as made of the receipt inspection for two of the purchase orders and observed several items in storage.

PO N3128	Repair of P-9105X
PO N3443B	Cage, Equal Percentage, for Fisher Valves S/N 6374792
PO N2951	Pipe 2½" CS
	Pipe 3" CR. Molly
PO N3263	Relief Valve
PO N3327	22 AWG 3 twisted pr. shielded

The NRC inspector questioned the disposition of NCR 80-27 which indicated a hold point for notification to QA prior to disassembly was not a quality hold point. This was resolved at the time of discussion and NCR 80-27A was issued which requires the motor to be insulation resistance tested prior to installation and verification of motor operability; e.g., excessive noise, vibration, overheating, and pump pressure for P-9105X (PO N3128).

The inspector had no additional questions in this area.

B. Review and Audit

The NRC inspector attended a Plant Operating Committee Meeting No. 411 to determine compliance with the Technical Specifications and other regulatory requirements. Additionally, the NRC inspector observed portions of QA Audit No. QAA 601-81-01 of the Water Chemistry and Radiochemistry areas.

C. Security

The NRC inspector attended a training lecture and verified that lesson plan objectives and the schedule were being met. Additionally, the NRC inspector observed that acceptable scores were achieved by several individuals during the conduct of weapons qualification testing.

D. Emergency Preparedness

The NRC inspector verified that the licensee's on site arrangements for medical support and treatment are implemented as described in the emergency plan. The NRC inspector also witnessed a training session for emergency preparation in which the control room operators were required to wear fresh air masks. The records of licensee personnel were also reviewed for emergency training.

No violations or deviations were identified.

10. Exit Interview

Exit interviews were conducted at the end of various segments of this inspection with Mr. D. Warembourg, Manager, Nuclear Production, and/or 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.