APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-267/89-12 Operating License: DPR-34

Docket: 50-267

Licensee: Public Service Company of Colorado (PSC)
P.O. Box 840
Denver, Colorado 80201-0840

Facility Name: Fort St. Vrain Nuclear Generating Station (FSV)

Inspection At: FSV, Platteville, Colorado

Inspection Conducted: June 1 through July 15, 1989

Inspectors: R. E. Farrell, Senior Resident Inspector
P. W. Michaud, Resident Inspector

Approved: T. F. Westerman 8-8-89
T. F. Westerman, Chief, Project Section B Date
Division of Reactor Projects

Inspection Summary

Inspection Conducted June 1 through July 15, 1989 (Report 50-267/89-12)

Areas Inspected: Routine, unannounced inspection of onsite followup of licensee event reports, operational safety verification, monthly surveillance observation, and monthly maintenance observation.

Results: Several operational events occurred during this inspection period, including a loop shutdown and a manual turbine generator trip (paragraph 4.a). The licensee's operations staff responded to each occurrence in an appropriate and competent manner.

The licensee's evaluations of Technical Specification (TS) compliance for out-of-service equipment have improved and were observed by the inspectors to be conservative and accurate (paragraph 4.a).

Procedural compliance continues to be a problem at FSV. An unanalyzed gaseous waste release occurred when a valve lineup procedure was not followed (paragraph 4.b).

DETAILS

1. Persons Contacted

*L. Brey, Manager, Nuclear Licensing and Resources
*M. Block, System Engineering Manager
*F. Borst, Nuclear Training Manager
*M. Cappello, Central Planning & Scheduling Manager
*A. Crawford, Vice President, Nuclear Operations
*M. Deniston, Superintendent of Operations
*D. Evans, Operations Manager
*C. Fuller, Manager, Nuclear Production
*J. Gramling, Supervisor, Nuclear Licensing-Operations
*M. Holmes, Nuclear Licensing Manager
*L. McBride, Strategic Planning & Resources Manager
*F. Novachek, Nuclear Support Manager
*H. O'Hagan, Outage Manager
*L. Scott, QA Services Manager
*N. Snyder, Maintenance Department Manager
*P. Tomlinson, Manager, Quality Assurance
*D. Warembourg, Manager, Nuclear Engineering

Other NRC Personnel

*B. Murray, Chief, RPB, RIV

The inspectors also contacted other licensee and contractor personnel during the inspection.

*Denotes those attending the exit meeting conducted July 19, 1989.

2. Plant Status

The plant remained at power during this inspection period. The licensee accomplished several online repairs of control systems, hydraulic valve actuators, and leaking valves. The month of June 1989 was one of the best power production months in the plant's 15-year operating history.

The licensee's management continues to advance plans for defueling and subsequent decommissioning. The licensee is continuing talks with NRR regarding the necessity of TS changes to support defueling activities.

3. Onsite Followup of Licensee Event Reports (LERs) (92700)

By letter dated April 19, 1989 (Heitner to Williams), the NRC staff accepted the licensee's disposition of specific LERs. The corrective actions associated with these LERs involved modifications which are no longer required due to the cessation of nuclear operations on or before June 30, 1990. The inspectors and regional management have reviewed these

LERs and agree that no further action associated with them is required for the remaining period of operation or for defueling. The following LERs are, therefore, considered closed:

LER 81-72 and 86-24	"PCRV Rupture Disc Found Out of Tolerance"
LER 84-02	"Inoperable Loss of Bearing Water Switch"
LER 85-10	"Automatic Actuation of Basic Plant Protective System Actions"
LER 87-11	"Loop Shutdowns"
LER 87-13	"Operation Prohibited by LCO 4.1.9"
LER 87-18	"Completion of Plant Shutdown Required by TS LCO 4.2.9"
LER 87-26	"Loss of Instrument Bus 2 Resulting in Scram Actuations"
LERs 88-03 and 88-16	"Reactor Scram Actuation on Neutron Flux Rate of Change High"

No violations or deviations were identified in the review of this program area.

4. Operational Safety Verification (71707)

a. General

On June 1, 1989, the licensee experienced rising reheat steam temperature in the B-2-6 steam generator module. An engineering evaluation indicated a blocked reheat steam attemperator nozzle as the probable cause. The licensee isolated feedwater flow to the other Loop 2 attemperator nozzles in an attempt to clear the blocked nozzle utilizing feedwater system pressure. This was attempted several times in the hope that the material plugging the nozzle was soft and would pass through, however, the results were unsuccessful. A strainer in the cold reheat piping downstream of the attemperator nozzle prevents foreign objects from entering the steam generator.

The licensee made the decision to attempt to install a new attemperator line and nozzle while the plant was on line. This would have required hot-tapping the cold reheat steam line and the feedwater line. The inspectors, in conjunction with Region IV management and NRR, were reviewing the licensee's plans when the plant experienced a shutdown of Loop 1 on June 7, 1989, due to a failed instrument fuse. Recovery from a loop shutdown requires

reducing reactor power to 2 percent. Consequently, the licensee abandoned plans to perform the hot taps on the B-2-6 steam generator lines.

The licensee reduced reactor power to 2 percent, recovered Loop 1, and took Loop 2 out of service. This allowed the licensee to disassemble the flanged connection holding the cold reheat steam attemperator nozzle in the cold reheat steam line. When this was accomplished, the licensee found a 3/8-inch diameter bolt blocking the 3/8-inch diameter attemperation nozzle. The bolt dropped out as soon as the nozzle was turned over after removal from the cold reheat steam line. There was no visible damage to the nozzle, and the system was reassembled. The loop was returned to service and has functioned satisfactorily since. The licensee performed a maintenance history search and a system walkdown but was unable to identify the bolt or source of the bolt.

On June 20, 1989, a hydraulic oil leak was discovered on Valve SV-2105, Helium Circulator Steam Turbine Speed Control Valve "A". The licensee immediately reduced power from 70 percent to less than 50 percent (limit for one circulator in a loop) and removed Helium Circulator "A" from service, isolating Valve SV-2105. The licensee shut both the upstream and downstream isolation valves, and performed an evaluation of compliance with TS LCO 4.4.1. The inspectors reviewed this evaluation, which concluded that the TS action statement which normally addresses this valve's operability was not applicable. This was due to the fact that the line was already isolated and in the configuration which Valve SV-2105 would place it on a steam line rupture detection and isolation system (SLRDIS) actuation. The licensee's evaluation of TS compliance for this condition was acceptable and no discrepancies were noted. Repairs were completed and Helium Circulator "A" was returned to service on June 22, 1989.

Following the recovery of Helium Circulator "A", power was increased to approximately 80 percent on June 22, 1989. Due to an error in the computer displayed secondary heat balance input, reactor power exceeded the authorized maximum limit of 82 percent for 4 hours on June 22-23, 1989. This was documented in Inspection Report 50-267/89-15.

On June 27, 1989, the Helium Transfer Compressor, C-2401, was severely damaged during its operation. This component is not safety related and not required for plant operation. Without C-2401, the plant must be depressurized through the reactor plant exhaust filters and the plant stack rather than to the helium storage facility. The apparent cause of the compressor's failure was a failure of piston rings which may be related to proper operating lubrication. The licensee estimates 3-6 months to acquire replacement parts. The licensee has placed an extra full helium trailer onsite while C-2401 is out of service to provide extra reactor coolant makeup capability.

An unexplained turbine runback occurred at 4:36 a.m. (MDT) on July 1, 1989. The control room operators tripped the turbine at 4:44 a.m. after load swings were observed. The reactor was stabilized at approximately 28 percent power and all systems responded as expected. Troubleshooting by the licensee determined that the load limit potentiometer in the turbine electro hydraulic control (EHC) circuitry was faulty. This component was replaced and the turbine was synchronized to the grid at 11:14 a.m. on July 1, 1989.

On July 6, 1989, at 3:10 a.m. with the plant at approximately 80 percent power, a weld broke on a 1/2-inch sensing line to a cold reheat steam pressure transmitter. This caused a minor steam leak in the reactor building and an upset in the plant control system since Pressure Transmitter PT 2243-2 provided a zero steam pressure signal. The situation was evaluated by the licensee's onshift crew and the plant was stabilized with the associated control circuits in manual control. Personnel were placed in ice vests and steam suits due to the difficult access to the area where a manual isolation valve, V-2222, was located. This valve was shut and the steam leak stopped at 5:08 a.m. The highest ambient temperature recorded in the reactor building was 115°F. The SLRDIS actuates at 171°F.

The broken weld was at the toe of a weld where the 1/2-inch pipe was inserted into a reducing insert in the 3/4-inch Valve V-2222. An initial examination indicated the cause of the break to be a fatigue crack. The licensee's materials engineering specialists are examining the section of piping which was removed to determine the exact mode of failure.

The repairs to this line changed the configuration slightly to provide less susceptibility to fatigue stress at this location. A 3/4-inch pipe now extends approximately 18 inches out of Valve V-2222, after which a reducing coupling is welded to make the transition to 1/2-inch pipe. Repairs were completed and the plant control systems returned to automatic at 3 p.m. on July 6, 1989.

The inspectors made daily tours of the control room during normal working hours and at least once per week during backshift hours. Control room staffing was verified to be at the proper level for the plant conditions at all times. Control room operators were observed to be attentive and aware of plant status and reasons why annunciators were lit. The inspectors observed the operators using and adhering to approved procedures in the performance of their duties. A sampling of these procedures by the inspectors verified current revisions and legible copies. During control room tours, the inspectors verified that the required number of nuclear instrumentation and plant protective system channels were operable. The operability of emergency AC and DC electrical power, meteorological, and fire protection systems was also verified by the inspectors. The reactor operators and shift supervisor logs were reviewed daily along with the TS compliance log, clearance log,

operations deviation report (ODR) log, temporary configuration report (TCR) log, and operations order book. Shift turnovers were observed at least once per week by the inspectors. Information flow was consistently good, with the shift supervisors soliciting comments or concerns from the reactor operators, equipment operators, auxiliary tenders, and health physics technicians. The licensee's station manager, operations manager, and superintendent of operations were observed to make routine tours of the control room.

The inspectors made tours of all accessible areas of the plant to assess the overall conditions and verify the adequacy of plant equipment, radiological controls, and security. During these tours, particular attention was paid to the licensee's fire protection program, including fire extinguishers, firefighting equipment, fire barriers, control of flammable materials, and other fire hazards.

A walkdown of the reserve shutdown system, control room ventilation system, and portions of the helium circulator bearing water and buffer helium systems was performed by the inspectors. Valve and breaker positions were verified where possible. When affected by a clearance, the valves or breakers were verified to be positioned in accordance with the clearance requirements. Power supplies for components in these systems were verified, but were also subject to clearances in some cases. During these system walkdowns, the inspectors verified the operability of standby or backup equipment when components or portions of systems were inoperable due to clearances.

b. Radiological Controls

At 1:35 a.m. on June 28, 1989, a routine gaseous waste release from Gas Waste Receiver "B" was initiated. At 1:55 a.m., the reactor operator noticed the pressure in Gas Waste Receiver "B" had not decreased from the original 250 psig, but that pressure in Gas Waste Receiver "A" had decreased from 60 psig to 50 psig. The release was secured and when the valve lineup was checked, it was found that Gas Waste Receiver "A" had erroneously been lined up to be released. Receiver "A" had not been sampled, thus making the release unanalyzed. The licensee immediately sampled Gas Waste Receiver "A". The results of the analysis showed the total activity released during the 20 minutes to be 2.51 E+4 microcuries. This represents 0.85 percent of the limits allowed by TS. The plant stack monitors were in service and did not alarm. An increase of approximately 200 cpm was recorded on the beta-particulate monitor; the alarm actuates at 2720 cpm.

The cause of this unanalyzed gaseous waste release was apparently due to a failure to adhere to Procedure NPAP-19, Issue 1, "Radioactive Gaseous Effluent Releases," Attachment 19C, step 1. This step states to "verify HS-6335 is positioned to tank 1B." When the valve lineup

was checked, HS-6335 was found positioned to Tank 1A. The licensee was informed that this is an apparent violation (267/8912-01).

The inspectors observed health physics technicians performing surveys and checking air samplers and area radiation monitors. Contamination levels and exposure rates were posted at entrances to radiologically controlled areas and in other appropriate areas and were verified to be up-to-date by the inspectors. Health physics technicians were present to provide assistance when workers were required to enter radiologically controlled areas. The inspectors observed workers following the instructions on radiation work permits concerning protective clothing and dosimetry, and observed workers using proper procedures for contamination control, including proper removal of protective clothing and whole body frisking upon exiting a radiologically controlled area.

c. Security

The inspectors randomly verified that the number of armed security officers required by the security plan were present. A lead security officer was on duty to direct security activities on each shift. The inspectors verified that search equipment, including an x-ray machine, explosive detector, and metal detector were operational or a 100 percent hands-on search was conducted.

The protected area barrier was surveyed by the inspectors to ensure it was not compromised by erosion or other objects. The inspectors observed that vital area barriers were well maintained and not compromised. The inspectors also observed that persons granted access to the site were badged and visitors were properly escorted.

5. Monthly Surveillance Observation (61726)

The inspectors reviewed the results of daily surveillance tests performed in accordance with Procedure SR 4.1.1.A.1a-x, "High Motor Temperature Partial Scram." This test is performed on the highest temperature control rod drive of any which are operating above 215°F once every 24 hours. The inspectors observed several of these tests performed on the Region 30 control rod drive, which generally operates at the highest temperature (approximately 241°F at 80 percent power). The inspectors verified the tests were performed at the required frequency and that the results showed no degradation in the performance of the control rod drive.

On June 29 at 10:45 p.m., a test of portions of the emergency lighting system was conducted to verify the adequacy of modifications made under Change Notice (CN) 2867. The inspectors witnessed the test, which was conducted in accordance with Special Test Procedure T-429. Adequate illumination levels were observed in the alternate cooling method (ACM) diesel generator control cubicle, 4160 VAC switchgear enclosure,

circulating water makeup pump house, and specific areas of the reactor and turbine buildings which had previously failed the test.

Emergency lighting battery packs for some areas in the reactor and turbine building are temporarily mounted and supplied power. The licensee has committed to have these battery packs permanently installed by October 1, 1989. The inspectors will observe a retest of these areas once the permanent installations are complete.

No violations or deviations were identified in the review of this program area.

6. Monthly Maintenance Observation (62703)

On June 8, 1989, the inspectors observed the disassembly of the cold reheat steam attemperator nozzle to Steam Generator B-2-6. The nozzle was blocked as predicted by the licensee's engineering evaluation. The blockage was due to a bolt in the nozzle the same size as the nozzle diameter. The bolt fell out when the nozzle was removed from the cold reheat steam line. Reassembly was done in accordance with approved procedures utilizing new fasteners. The presence of maintenance supervision and operations supervision was noted by the inspectors. The inspectors also noted that the activity was 100 percent witnessed by the licensee's quality control inspectors. Work was performed in accordance with Station Service Request (SSR) 89502882.

On June 17, 1989, the licensee observed high vibrations on Boiler Feed Pump "C". Power was reduced from 80 percent to less than 70 percent and Feed Pump "C" was removed from service. Each of the three feed pumps at FSV has a 33 percent capacity and has the ability to supply the emergency feedwater header.

The pump was disassembled and the outer bearing was found excessively worn. The licensee replaced the pump runner assembly (volute and impeller assembly) and returned Feed Pump "C" to service on June 22, 1989. The inspectors observed portions of these maintenance activities, which were performed under SSR 89503043 and Maintenance Procedure MP-1805, "Byron-Jackson Feed Pumps."

The inspectors observed maintenance performed on "A" Helium Circulator Speed Control Valve SV-2105 to repair a hydraulic oil leak which developed on June 20, 1989. Two attempts to repair the leak were necessary, with the second being successful. Helium Circulator "A" was returned to service on June 21, 1989.

No violations or deviations were identified in the review of this program area.

7. Exit Meeting (30703)

An exit meeting was conducted on July 19, 1989, and attended by those identified in paragraph 1. At this meeting, the inspectors reviewed the scope and findings of the inspection. The licensee did not identify any proprietary any of the information provided to, or reviewed by, the inspectors.