

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-267/86-03

License: DPR-34

Docket: 50-267

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

Facility Name: Fort St. Vrain Nuclear Generating Station

Inspection At: Fort St. Vrain Nuclear (FSV) Generating Station, Platteville,
Colorado

Inspection Conducted: January 1-31, 1986

Inspectors:

Robert E. Farrell
R. E. Farrell, Senior Resident Inspector (SRI)

2-6-86
Date

M. E. Skow
M. E. Skow, Reactor Inspector (RI), Project Section A,
Reactor Projects Branch

2/21/86
Date

Approved:

J. P. Jaudon
J. P. Jaudon, Chief, Project Section A
Reactor Projects Branch

2/21/86
Date

Inspection Summary

Inspection Conducted January 1-31, 1986 (Report 50-267/86-03)

Areas Inspected: Routine, unannounced inspection of operational safety verification, review of licensee event reports, training accreditation with INPO, I&E Notice 85-100 (Rosemount transmitters), ESF-circulator break and seal remote actuation, and water ingress incident. The inspection involved 102 onsite hours and 8 offsite hours by two NRC inspectors.

Results: Within the areas inspected, no violations or deviations were identified.

DETAILS1. Persons ContactedPrincipal Licensee Employees

- *T. Borst, Support Services Manager
- *R. Craun, Site Engineering Manager
- M. Deniston, Shift Supervisor
- T. Dice, Shift Supervisor
- D. Evans, Superintendent Operations
- *M. Ferris, QA Operations Manager
- *C. Fuller, Station Manager
- *J. Gahm, Manager Nuclear Production
- J. Hak, Shift Supervisor
- *M. Holmes, Manager, Nuclear Services
- *F. Novachek, Technical/Administrative Services Manager
- H. O'Hagan, Shift Supervisor
- *T. Prenger, QA Services Manager
- S. Shafer, Shift Supervisor
- *L. Singleton, Manager QA
- *D. Warembourg, Manager Nuclear Engineering
- S. Wilford, Superintendent of Training

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

*Denotes those attending the exit interview conducted February 5, 1986.

2. Operational Safety Verification

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

The review was conducted by direct observation of activities, tours of the facility, interviews and discussions with licensee personnel, independent verifications of safety system status and limiting conditions for operations, and review of facility records.

Logs and records reviewed included:

- . Shift supervisor logs
- . Reactor operator logs
- . Equipment operator logs
- . Auxiliary operator logs

- . Technical specification compliance logs
- . Operations deviations reports
- . Temporary configuration reports

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

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

During plant tours, the NRC inspectors noted instances of compressed gas bottles that were improperly secured. After discussions with licensee plant and engineering management, the problem appears to be due to construction personnel working in the plant. Proper securing of compressed gas bottles is covered by licensee practices and is recognized as a clear personnel and equipment safety concern. The SRI will monitor compressed gas bottle storage to determine the effectiveness of licensee corrective action.

No violations or deviations were identified.

3. Review of Licensee Event Reports

a. Miscellaneous Causes

(Closed) LER 84-008, "High reactor pressure scram and ensuing control rod automatic insertion failures."

This event resulted in a plant shutdown of over 12 months duration while the licensee, under close NRC scrutiny, rebuilt all control rod

drive mechanisms, revised control rod drive maintenance practices, and committed to new control rod drive technical specifications. All of these activities have been previously inspected and found in compliance with NRC regulations.

(Closed) LER 85-009, "Loop I automatic shutdown initiated by Plant Protective System."

The licensee's analysis, corrective action and followup testing appeared to be adequate.

(Closed) LER 85-013, "Loop II steam generator penetrations not pressurized above cold reheat pressure when reactor pressure above 100 psig."

This was an LCO violation. The incident was the subject of an NRC notice of violation which has subsequently been closed.

(Closed) LER 85-020, "Decreased primary coolant flow/loss of vacuum manual scram."

This event occurred at low power (less than 1%) when circulator drive steam and condenser vacuum was maintained by steam from oil fired auxiliary boilers. The loss of both boilers reduced primary coolant flow rate below LCO requirements and the operators when scrammed the reactor. The NRC SRI was in the control room when the event occurred and observed operator action. Operator actions were correct.

(Closed) LER 85-027, "Loop II shutdown due to operator error while racking equipment circuit breakers open and closed."

The licensee's analysis and corrective actions are in accordance with NRC regulations.

No violations or deviations were identified in this inspection area.

b. Circulator Trip Events

(Closed) LER 85-014, "A helium circulator trip on buffer-mid-buffer differential pressure."

Cycling of the main drain control valve because of a faulty controller caused the sensing lines to see a pressure spike in buffer helium, which initiated the circulator trip.

(Closed) LER 85-015, "A helium circulator trip on buffer-mid-buffer differential pressure."

Same cause as LER 85-014. LER 85-014 occurred on August 8, 1985. LER 85-015 occurred on September 3, 1985. The defective controller has been replaced.

(Closed) LER 85-016, "A helium circulator trip on buffer-mid-buffer differential pressure (two separate occasions)."

These trips were caused by water in instrument sensing lines.

(Closed) LER 85-022, "B helium circulator trip while draining buffer-mid-buffer knock-out pot."

Clean helium was vented while draining the knock-out pot causing a low buffer-mid-buffer pressure which caused the circulator trip.

(Closed) LER 85-023, "D helium circulator trip following isolation of PDT-2178-1."

PDT-2178-1 is a D circulator main drain pressure differential transmitter. It was isolated to repair a buffer helium leak. Buffer helium flow had been increased to compensate for the leak prior to isolating the leaking instrument. Isolating the leaking instrument without decreasing buffer helium flow caused remaining instrumentation to sense a high buffer helium pressure and consequently to trip the circulator.

(Closed) LER 85-026, "C helium circulator trip due to water in instrument sensing lines."

This LER is similar to LER 85-016.

c. Unplanned Scrams

(Closed) LER 85-017, "Unplanned Scram Actuation due to technician error while the reactor was shutdown."

This event was addressed in a previous report and an NRC notice of violation was issued for failure to report the event within the required time.

(Closed) LER 85-018, "Unplanned scram actuation due to technician error while the reactor was shutdown."

This was the second unplanned scram actuation within a time period of two weeks. Both events were due to technician error.

d. Rod Withdrawal Prohibits (RWPs)

(Closed) LER 85-019, "Spurious RWPs."

This LER reported 90 RWPs. 84 of these were from the startup channel fission count rates and 6 were from the rod withdrawal circuit over-current sensors. The NRC SRI was in the control room and observed many of the RWP actuations. Operator action was correct in all occasions.

(Closed) LER 85-025, "Spurious RWPs."

This LER reported 2 RWP actuations.

This LER and LER 85-019 were attributed by the licensee to noise on the signal channels. The licensee is evaluating these circuits to eliminate the noise problem and eliminate spurious actuations of the rod withdrawal prohibit circuitry. The NRC SRI is following this activity.

(Closed) LER 85-024, "Received Incorrect Rod Sequence RWPs during reactor shutdown operations."

This event resulted in 25 RWPs due to the control rod sequence select switch being in the wrong position. The sequence of rod insertion was correct. The operating personnel involved have been disciplined and retrained. However, the occurrence of 25 alarms prior to the cause being identified indicated a potential insensitivity to alarms by operating personnel and the need to expeditiously eliminate spurious alarms.

4. Institute of Nuclear Power Operations (INPO) Accreditation of FSV Training Program

The licensee is working towards INPO accreditation of all facets of the training program at FSV. Between January 1, 1985 and January 31, 1986, the licensee has expended 18,892 manhours towards this goal. The schedule for submittal of self evaluation reports (SER) on each aspect of the training program is as follows:

Target Date (SER) Submitted to INPO

Non-License	9/30/85 (submitted)
Reactor Operator	9/30/85 (submitted)
Senior Operator/Shift Supervisor	9/30/85 (submitted)
Technical Advisor	9/30/86
Technical Staff/Manager	9/30/86
Radiological Protection Tech.	9/30/86
I & C Technician (Results)	9/30/86
Maintenance Personnel	9/30/86
Electrical Maintenance Personnel	9/30/86
Chemistry Technician	9/30/86

5. I & E Information Notice 85-100

I & E Information Notice 85-100 cautioned licensees to evaluate Rosemount transmitters Model 1153, Series B, which are subject to zero setpoint drift.

The licensee performed a records search and determined that, although they do have some Rosemount transmitters installed, none of the Rosemount transmitters at FSV are the model of concern.

No violations or deviations were identified.

6. ESF-Circulator Brake and Seal Remote Actuation

Previously, in NRC Inspection Report 50-267/85-36, the NRC SRI documented walkdown inspection of the licensee's installation of a remote actuation for the helium circulators' brakes and mechanical shaft seals utilized during shutdown as a barrier to prevent primary reactor coolant leakage.

At that time, installation and functional testing was not complete. During this inspection period, installation and functional testing of the remote actuation capability was completed. The NRC SRI completed a walkdown inspection of those portions of the remote actuation equipment which were previously still under construction. Additionally, the NRC SRI verified that functional testing of this installation had been completed on all four helium circulators.

No violations or deviations were identified in this inspection area.

7. Water Ingress Incident

In the course of restoring equipment, specifically, a helium circulator, to operability in preparation for plant startup, the licensee experienced a water ingress to the core which precluded the plant from starting up for approximately 3 weeks.

This incident had no safety significance since the plant was shutdown when it occurred. If it had occurred while the plant was at power, a reactor scram would have followed. The plant has a high trip point of 500 parts per million (PPM) moisture in primary coolant which was exceeded by several thousand PPM when 150-200 gallons of water was added to the primary coolant.

This incident occurred due to operator error and failure to properly follow a procedure. The incident and the underlying cause were identified by the licensee.

The narrative of the incident follows. The licensee was restoring a helium circulator to operation following removing the circulator from operation to facilitate environmental qualification work on this circulator. When a circulator is removed from service, the auxiliary systems, such as buffer (clean) helium and bearing water, are isolated from the circulator. The procedure for removing a circulator from service includes a caution that the bearing water flow control valves fail open upon loss of electrical power and, consequently, the manual isolation valve downstream of the bearing water flow control valves must be closed prior to removing power from these fail open valves. If power is removed from the flow control valves with the manual isolation valve open, bearing water will flow to the circulator, up the circulator shaft, and into the reactor core.

The operators followed the procedure and correctly isolated the circulator from service without incident. The planned work was performed. When the operators restored the circulator to service, they were to perform the same steps as for taking the circulator out of service but to reverse the steps.

When the circulator was restored to service, the correct sequence was to replace the fuses restoring power to the fail open flow control valves (which would have closed them) and, following this closure, open the manual bearing water isolation valve.

Rather than do the above, the operators first opened the manual bearing water isolation valve. Approximately 6 minutes later, the operators replaced the fuses restoring power to the fail open bearing water flow control valves. The licensee estimates that between 150 and 200 gallons of water entered the core during the time that the flow path was open.

The NRC inspector noted that the licensee took appropriate corrective action.

No violations or deviations were identified in this inspection area.

8. Exit Interview

The SRI conducted an exit interview on February 5, 1986, attended by those indicated in paragraph 1. The SRI reviewed the scope and findings of the inspection at this meeting.