APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-267/85-03 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 (FSV) Site, Platteville, Colorado

Inspection Conducted: February 1-28, 1985

Inspectors: for R. E. Ireland 3/27/85
G. L. Plumlee III Date
Senior Resident Inspector (SRI)

Other Accompanying Personnel: Harold Miller, EG&G Consultant

Approved: R. E. Ireland 3/27/85
R. E. Ireland, Chief Date
Special Projects and Engineering Section

Inspection Summary

Inspection Conducted February 1-28, 1985 (Report 50-267/85-03)

Areas Inspected: Routine/reactive, unannounced inspection of control rod drive event, Fort St. Vrain assessment report, helium circulator bolting, licensee event report, maintenance, operational safety verification, periodic special report, and surveillance. The inspection involved 53 inspector-hours onsite by one NRC inspector and 84 inspector-hours by one NRC consultant.

Results: Within the eight areas inspected, one violation (failure to follow procedures, paragraph 2) was identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

D. Alps, Security Supervisor
L. Bishard, Maintenance Supervisor
*T. Borst, Support Services Manager
D. Brown, I&C Supervisor
*B. Burchfield, Superintendent Nuclear Betterment Engineering
W. Craine, Superintendent of Maintenance
*R. Craun, Supervisor Nuclear Site Engineering
J. Eggebroten, Technical Services Engineering Supervisor
*W. Franek, Superintendent Operations
*C. Fuller, Station Manager
*J. Gahm, Manager Nuclear Production
*J. Gramling, Supervisor of Nuclear Licensing - Operations
*M. Holmes, Nuclear Licensing Manager
J. Jackson, QA/QC Supervisor
J. McCauley, Results Engineering Supervisor
*P. Moore, QA Technical Support Supervisor
*M. Niehoff, Site Engineering Manager
*F. Novachek, Technical/Administrative Services Manager
*T. Orlin, Superintendent QA Services
J. Petera, Electrical Supervisor
*G. Powers, Senior Maintenance Scheduler
*T. Prenger, QA Engineering Supervisor
G. Redmond, MQC Supervisor
G. Reigel, Shift Supervisor
*D. Rogers, Staff Assistant
*T. Schleiger, Health Physics Supervisor
*L. Singleton, Manager QA
H. Starner, Coordinator Nuclear Site Construction
J. Van Dyke, Shift Supervisor Administration
*D. Warembourg, Manager Nuclear Engineering

The SRI also contacted other plant personnel including administrative electrical, maintenance, reactor operators, and technicians.

*Denotes those attending the exit interview.

2. Control Rod Drive (CRD) Event

Resulting from previous CRD refurbishment activities, the licensee has now entered into a 100% CRD refurbishment program as out 'ned in the licensee's February 3, 1985, letter P-85046. The following is a chronological summary of the SRI's observations for this reporting period:

- February 4 - From a review of the station logs, the SRI noted that during back-EMF testing on February 1-2, 1985, the Regions 31 and 32 CRDs again failed to scram from the fully withdrawn position. Similar events were identified in NRC Inspection Report 84-34. In each case the CRDs were manually inserted.

- February 14 - The SRI reviewed special tests T-260 and T-261 developed to investigate static torque characteristics of the shim motor when not connected or when connected to the 200 assembly. SRI comments were addressed in procedure deviation reports 85-357 and 85-358.

- February 14 - The SRI determined that the licensee's Material Receipt Inspection Manual MRIM-2.4, "Special Receiving Inspection for Control Rod Drive Parts," and MRIM-2.11, "Special Receiving Inspection for Control and Orificing Assemblies," were not being used as required. NRC Inspection Report 85-01 identified this as a violation.

- February 14 - The SRI verified that numerous CRD parts were on hold at the FSV warehouse due to a lack of documentation. In some cases neither a purchase order nor a design document had been issued against which a receipt inspection could be performed by QC. Followup on this problem indicated that conforming orders to General Atomic Technologies for CRD parts had been placed over the phone by the PSC nuclear engineering division (NED) without a purchase requisition reviewed by NED and QA. As a result, CRD parts were arriving onsite without the necessary documentation. This placed the licensee in a mode of issuing purchase orders and design documents to address the parts on hold. Administrative Procedure Q-4, "Procurement Document Control," requires that prior to confirming quality-related purchase orders to the vendor, the purchase requisition is to be routed to NED and then QA for review. The licensee was informed that the failure to follow their QA program requirements is considered a violation (8503-01).

- February 25 - The SRI reviewed Core Management Guide CMG-13, "Verification of the Shutdown Margin During In-Core Maintenance," Issue 5, dated February 15, 1985. Clarification type comments were provided to the licensee for inclusion into the next revision currently in progress.

- February 25 - The SRI noted a loss of traceability for new quality-related CRD parts. A slinger and locknut were laying loose in the parts bin located on the refueling floor without the required documentation for traceability. The maintenance QC inspector subsequently disposed of these parts as trash.

- February 26 - The SRI reviewed the following design documents:

  CN 1933 - This CN was written to justify changing the control rod cable material from AISI 347 stainless steel to Inconel 625. The material for other bolts, tubing, and fittings will also be changed to avoid stress corrosion problems. Two CRD components will also involve geometry changes for better limit switch operation.

  CN 1933A - Justification of deviations from previous plant procedures and practices from previous CRD refurbishment.

  CN 1933B - Authorizes the use of the existing bolt material for the control rod clevis bolts. The bolts made of Inconel X-750 should be used to replace the old bolts when available.

  CN 1933C - Incorporates documents that were changed by General Atomic change notices that reflect changes to parts in the CRD assembly.

- February 28 - The SRI initiated a review of the numerous nonconformance reports (NCR) issued to date against the CRD refurbishment activities. Findings will be documented in NRC Inspection Report 85-07.

During the period February 11-26, 1985, a NRC consultant was onsite reviewing the CRD refurbishment activities. Some of his observations are documented in NRC Inspection Report 85-01. His remaining observations are as follows:

- Observed, monitored, and provided recommendations to improve the licensee's parts control problems, tool control, and procedure problems.

- Recommended a more accurate and simpler procedure to obtain bearing measurements during bearing preloading.

- During procedure reviews, the NRC contractor noted the most common problems to be: (1) steps not signed, (2) steps not checked, and (3) second check-off not dated.

- Noted that drawings used as reference during 200 assembly refurbishment were noncontrolled and had notes written on them. This has subsequently been corrected by the licensee by removing the questioned drawings.

- Determined that a modification was being made to a safety-related part (i.e. bolt heads drilled for lockwire) without drawings or QC inspection. This was corrected by the licensee via attachment of a drawing having the acceptance criteria and subsequent QC verification to the NCR that authorized the modification.

The SRI had no further observations in this area.

3. Fort St. Vrain Assessment Report

The SRI reviewed the following items for possible violation of license requirements:

- On page 2-9 of the report the summary of the control rod problem suggests that the failures could have been prevented or mitigated had routine preventive maintenance been performed. The SRI verified that preventive maintenance requirements were not required for the CRDs.

- Section 4.2.5.2 (page 4-6) lists two deficiencies in procedural controls for licensed operators to review various logs when returning to watch standing duties after an extended absence and for the conduct of required plant tours. The lack of a shift turnover procedure was addressed as a violation in NRC Inspection 84-16. Conduct of periodic plant tours by PSC management was addressed in NRC Inspection Report 84-29 under followup to Open Item 50-267/8415-03.

- Section 4.2.5.4 (page 4-7) lists two problems with tagging. The SRI confirmed that procedural controls were lacking. The licensee is revising their administrative procedure P-2, "Equipment Clearances and Operation Deviations," Issue 10, dated July 10, 1984, to address the problems.

- Section 4.2.5.6 (page 4-8) discusses the licensee's program for double verification of safety-related maintenance activities and lifted or jumped leads and points out potential problems. As documented in NRC Inspection Report 82-27, the licensee's response to the independent verification requirements of NUREG 0737, Article I.C.6 was found acceptable.

No violations or deviations were identified.

4. Helium Circulator Bolting

On February 15, 1985, and subsequently on February 19, 1985, nonemergency 4-hour reports were made by the licensee concerning helium circulator C-2102 bolting stress corrosion cracking. This circulator, previously removed from the PCRV due to an interspace penetration moisture

in leakage problem, was undergoing repair by General Atomic Technologies (GA). Inspection of this circulator and a spare circulator (C-2104) already undergoing refurbishment by GA revealed the following information:

- PRIMARY CLOSURE BOLTS - 300-40 (Reference GA Drawing C-2101-300)

  Material - H-11, high strength ferrific, Cd plated
  Properties - 260,000 ultimate; 215,00 yield
  Number of Bolts - 24 bolt circle
  Size - 3/4" diameter

  INSPECTION RESULTS

  Circulator 2102

  Six bolts inspected (one initial failure in torque, five selected at random)
  Results - 1 failed in initial torque
  2 exhibit stress corrosion cracks
  3 no problems identified
  23 Bolts - Fluorescent Liquid Penetrant (L.P.) checked with no indications

  Circulator 2104

  Six bolt inspected, selected at random
  Results - no indications
  24 Bolts - Fluorescent L.P. - no indications

- STATOR BOLTS - 380-10

  Material - A-286, precipitation hardened austenitic stainless silver plated
  Properties - 135,000 - 160,000 ultimate; 65,000 - 115,000 yield
  Number of Bolts - 12 bolt circle
  Size - 6/16" diameter

  INSPECTION RESULTS

  Circulator C-2102

  Six bolts inspected (selected at random)
  Results - 4 - Linear indications on top three (3) threads essentially 360 degrees. Top three (3) threads not engaged. Cracking in cold worked area (40 to 50 mils typically)
  2 - No defects identified

Circulator C-2104

Six bolts inspected
Results - No indications

- DUCT HOLD DOWN BOLTS - 340-9

Material - A286
Properties - 135,000 - 160,000 ultimate; 65,000 - 115,000 yield
Number of Bolts - 12 bolt circle
Size - 5/8" diameter

INSPECTION RESULTS

Circulator C-2102

Two bolts inspected
Results - no indications

Circulator C-2104

Two bolts inspected
Results - no indications

- ROTOR BOLTS - 300-5

Material - Inconel 718
Properties - 185,000 ultimate; 150,000 yield
Number of Bolts - 8 bolt circle
Size - 3/8" diameter

INSPECTION RESULTS

Circulator C-2102

Two bolts inspected
Results - no indications

Circulator C-2104

No inspection performed

The licensee's planned actions are as follows:

- Replace the following bolting in circulators 2102 and 2104 with Inconel 718:

300-40 primary closure bolts
380-10 stator bolts
340-9 duct hold down bolts

- Pull "B" helium circulator to evaluate 300-40, 380-10, and 340-9 bolting.

- Further actions will be evaluated pending results of "B" helium circulator investigation.

5. Licensee-Event Report (LER)

The SRI reviewed licensee event reporting activities to verify that they 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 LERs were reviewed for adequacy:

(OPEN) 84-011 Supplemental, Revision 1
(OPEN) 85-001 Final

No violations or deviations identified.

6. Maintenance (Monthly)

The SRI reviewed records and observed work in progress to ascertain that the following maintenance activities were being conducted as required by approved procedures, Technical Specifications, and appropriate Codes and Standards. The following maintenance activity was reviewed and observed:

- SSR 85501772 - Lift-off testing of PCRV Tendon TIL-M2 in accordance with MP 11-6, "PCRV Prestressing Tendon Lift-Off Procedure"

During performance of the tendon visual inspection required by the above procedure, the SRI determined that visual inspection was inconclusive in determining the extent of corrosion since the grease applied to the previously inspected side penetrated to the side being inspected. Procedure Deviation Report (PDR) 85-397 was subsequently issued requiring the addition of grease not to interfere with visual examinations. The SRI also noted corrosion on the threads of a washer for Tendon TOR-M2. Nonconformance Report 85-066 indicated that the threads should support the load associated with the lift-off.

No violations or deviations were identified.

7. 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:

- Auxiliary Operator Logs
- Clearance Log
- Equipment Operator Logs
- Operations Deviations Reports
- Operations Order Book
- Reactor Operator Logs
- Shift Supervisor Logs
- Shift Turnover Checklists
- Station Service Requests (SSR)
- Technical Specification Compliance Logs
- Temporary Configuation Reports

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

- Annunciators
- Clearance Tags
- Control Room Manning
- Fire Hazards
- Fluid Leaks
- Hanger/Seismic Restraints

- Housekeeping
- Monitoring Instrumentation
- Piping Vibrations
- Radiation Controls

The procedure was reviewed and implementation observed for Radioactive Liquid Effluent Release 870.

No violations or deviations were identified.

8. Periodic-Special Report

The SRI reviewed the following report for content, reporting requirement, and adequacy:

- Monthly Operations Report for the month of January 1985

No violations or deviations were identified.

9. Surveillance (Monthly)

The SRI reviewed aspects of surveillance testing involving safety-related systems. The review included observation and review of Technical Specification requirements. The surveillance test reviewed and observed was:

- ESR 8.1.2bcd-M - "Radioactive Liquid Effluent System Instrumentation Function Test" (Release 870)

During a review of the above surveillance, the SRI noted an error on Attachment P-3B, "Radioactive Liquid Release Authorization," regarding the minimum dilution rate entered on lines 6 and 9. This was subsequently corrected by the reactor operator.

No violations or deviations were identified.

10. Exit Interview

Exit interviews were conducted at the end of various segments of this inspection with Mr. J. W. Gahm, Manager Nuclear Production, and/or other members of the PSC staff as identified in paragraph 1. At the interviews, the SRI discussed the findings indicated in the previous paragraphs. The licensee acknowledged these findings.