APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION REGION IV

NRC Inspection Report: 50-267/84-29 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 Conductad: October 1-31, 1984

Inspector:

Senior Resident Inspector (SRI)

Special Projects & Engineering Section

2/22/85 Date

Inspection Summary

Inspection Conducted October 1-31, 1984 (Report 50-267/84-29)

Areas Inspected: Routine/reactive, unannounced inspection of licensee action on previous inspection findings; operational safety verification; maintenance; surveillance; IE bulletin followup; control rod drive event followup; design control; independent inspection; and review of periodic and special reports. The inspection involved 135 inspector hours onsite by one NRC inspector.

Results: Within the nine areas inspected, two violations (failure to follow procedures, paragraphs 7 and 8), one violation (design verification, paragraph 8), one unresolved item (inadequate high range radiation detector calibration, paragraph 9), one open item (revision to Administrative Procedure P-2, paragraph 3), and an addition to a previous open item (8420-04) were identified.

DETAILS

1. Persons Contacted

Principal Licensee Employees

- L. Bishard, Maintenance Supervisor
- *T. Borst, Support Services Manager/Radiation Protection Manager

*D. Brown, I&C Supervisor

*B. Burchfield, Superintendent Nuclear Betterment Engineering

*W. Craine, Superintendent of Maintenance

R. Craun, Supervisor Nuclear Site Engineering

*M. Deniston, Shift Supervisor

*J. Eggebroten, Technical Services Engineering Supervisor

D. Evans, Shift Supervisor

- *M. Ferris, QA Operations Manager
- *W. Franek, Superintendent Operations

*C. Fuller, Station Manager

- *J. Gahm, Manager Nuclear Production
- *M. Holmes, Nuclear Licensing Manager

J. Hunter, Shift Supervisor 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

H. O'Hagen, Shift Supervisor

- *T. Orlin, Superintendent QA Services
- *G. Powers, Senior Maintenance Scheduler
- T. Prenger, QA Engineering Coordinator

*G. Redmond, MQC Supervisor

J. Reesy, Nuclear Design Manager

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 reactor operators, maintenance men, electricians, technicians, and administrative personnel.

*Denotes those attending the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item(50-267/8231-01): Change to LCO 4.4.5 (CAAR-594). Amendment 43 to the Facility Operating License DPR-34 allowed the use of alternate moisture monitoring instrumentation at low power levels.

(Open) Open Item (50-267/8401-02): Revision to APM 0-7 and Submittal of CRDOA Component Information (CAAR-602 and 603). Administrative Procedure Q-7, "Control of Procured Materials and Services," Issue 6, dated August 27, 1984, and Procedure MRIM-1, "General Receiving Inspection," Issue 3, dated November 21, 1983, now require referencing nonconformance report (NCR) numbers and limited use instructions on the quality related nuclear parts tag to ensure proper control of quality related material. The second part of this open item will remain open pending placement of memorandum PPC-84-0778, dated March 22, 1984, into records storage as a quality record documenting control rod drive and orificing assemblies (CRDOA) locations by serial number, absorber serial number and type, and reserve shutdown (RSD) material type to serve as the basis for the existing configuration as of October 1, 1983. All CRDOA manipulations subsequent to the above configuration report will be documented by Procedure CMG-12 and retained to allow control rod movement management by official records.

(Closed) Open Item (50-267/8413-02): MQC Training Program Documentation (CAAR-814). Procedures TASMAP-2, "Maintenance Quality Control Program," Issue 8, dated July 16, 1984, and TPAM, "Training Programs Administrative Manual," Issue 25, dated July 18, 1984, corrected the problems identified.

(Open) Open Item (50-267/8413-03): Identification of Safety-Related Work on PTRs (CAAR-815): The licensee has identified the underlying cause to be the reactor operators' lack of knowledge in the use of the Specification SR-6-2 in order to identify safety-related structures. This item will remain open until completion of formal retraining in this area.

(Closed) Open Item (50-267/8413-04): Revision to MP 11-8 (CAAR-816). MP 11-8, "Retentioning PCRV Tendons," Issue 2, dated August 9, 1984, corrected the deficiencies.

(Closed) Open Item (50-267/8414-06): Revision to FSAR Section 8.2 (CAAR-824). The July 1984, Revision 2 to the licensee's FSAR corrected the deficiencies.

(Closed) Open Item (50-267/8414-10): Label ACM Exhaust Fan Damper and Revise TASMAP-7, Attachment 7C (CAAR-828). The labeling problem was corrected and with the transfer of the MQC organization to the QA division as identified in NRC Inspection Report 84-22, revision to TASMAP-7 is not required.

(Open) Open Item (50-267/8415-03): Site Tour Problem and Housekeeping (CAAR-831). PSC letter P-84169, dated June 8, 1984, described the licensee's program to improve the level of housekeeping at FSV. The SRI verified that this program is being implemented. In order to maintain a sufficient level of houseke ring, the licensee is implementing other items such as: (1) management of supervision tours of plant areas, (2) division of housekeeping responsibilities between operations, maintenance, and regard the trements, (3) technical advisor weekly tour with the equipment of crate of identify equipment/housekeeping

deficiencies, and (4) shift supervisor weekly tours for "D" shift. This item will remain open until formalization of this program has been completed.

(Closed) Unresolved Item (50-267/8422-05): Use of "Engineering Judgement" as a DR Justification. This item has been made the subject of a Notice of Violation.

3. Operational Safety Verification

The SRI 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 observation of activities, tours of the facility, interviews and discussions with licensee personnel, independent verification 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 Order Book
- · Operations Deviation Reports
- Clearance Log
- · Temporary Configuration Reports
- · 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

Items of concern identified during plant tours were reported to the licensee for correction and consisted of items such as instrument indicator lights burnt out, flexible conduit pulled loose, paint on valve stems, a broken valve stem, poor housekeeping in the steam water dump tank (SWDT) room, apparent lack of preventive maintenance on the SWDT pump, valve handwheels loose at the hydraulic unit, uncontrolled and outdated manuals in the control room and on the refueling floor, poor housekeeping in areas of the turbine building, bent steam pipe movement detection device, temporary copper tubing not removed after use, auxiliary system status tag laying on the deck, and junction box not securely fastened.

During a tour of the control room and the plant on October 1, 1984, the SRI verified that plant drawings PI-21-9 and 21-10 had been updated to reflect plant modifications to the Loop 2 high pressure separator in accordance with the PSC's moisture ingress committee's recommendation as implemented by CN 1707. However, the sections of the drawings that were revised were not legible. This was reported to the senior reactor operator and followup corrective actions resulted in replacement of the drawings.

On October 23, 1984, during an operation to flush a radioactive liquid waste receiver, a misunderstanding of instructions from the shift supervisor resulted in potentially radioactive liquid overflowing from a drain and spilling over into the reactor building sump (RBS). Automatic releases from the RBS were immediately terminated until the RBS could be sampled. This drain was apparently connected to the liquid waste system but was not identified on the plant drawings. The concern regarding drains not being identified on plant drawings was previously identified in NRC Inspection Report 84-20.

On October 24, 1984, during a review of the clearance log, the SRI determined that previously issued standard clearances were being modified (i.e., either valves added or removed) without the shift supervisor's documented approval. The licensee's Administrative Procedure P-2, "Equipment Clearances and Operation Deviation," Issue 11, dated October 10, 1984, requires the shift supervisor to approve a clearance order but is silent on revisions to these orders which might have a

significant affect on the plant line-up authorized by the clearance. Operations Order 84-12, dated October 25, 1984, was issued requiring any correction on the standard clearance point form to be initialed by a shift supervisor. The licensee was informed that this is considered an open item (8429-01) pending review by the NRC inspector of the revision to Procedure P-2 implementing this requirement.

The procedure was reviewed and implementation observed for Radioactive Liquid Effluent Release 844.

No violations or deviations were identified.

4. Maintenance (Monthly)

The SRI 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. The following maintenance activities were reviewed and observed:

FHPWP-84	Fuel Handling Procedures Work Package for the Inspection and Removal of CRDOA 25 Cable/Cable Seal
CN 1639/CWPs 84-146, 84-150, 84-151, 84-152, & 84-153	Install New Lines to System 61 from System 23 (the Purification Coolers) and System 62. Developed to: (1) recycle T-6101 through F6101 via P-6101, (2) pump T-6101 to liquid waste receiver via F-6101, (3) drain the regeneration system front-end coolers to T-6101, and (4) recycle liquid waste through F-6101 and/or the System 62 demineralizers
CN 1909/CWP 84-234	Addition of Cable Seal Access Windows to CRD S/N 25

No violations or deviations were identified.

Surveillance (Monthly)

The SRI reviewed 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 5.2.3.b-A	Tendon Load Cell Alarm Check
SR 5.4.10-SA/BiA	Seismic Instrumentation Functional and Calibration Test
SR 5.4.1.3.2.b-M	Feedwater Flow Test
ESR 8.1.2.bcd-M	Radioactive Liquid Effluent System Instrumentation Functional Test (Release 844)

As a result of an earthquake that occurred at 9:30 a.m. MDT on October 18, 1984, centered about 60 miles south of Casper, Wyoming, and the subsequent report that FSV's seismic recorders did not register any activity, the NRC's recommendation to check the calibration of this instrumentation was followed by the SRI. The SRI determined from a review of SR 5.4.10-SA/BiA, Issue 15, dated August 5, 1983, and from discussions with the licensee, that surveillance procedures check the electronics but not the mechanical portion of the seismic sensors. The sensors were subsequently returned to the manufacturer and were verified to be functional and in specification.

No violations or deviations were identified.

6. IE Bulletins

The SRI verified by record review, observation, and discussion with the licensee the actions taken in response to IE Bulletins.

(Open) IE Bulletin 80-11: Masonry Wall Design. An update of unresolved item 8422-05, previously identified in NRC Inspection Report 84-22, concerning findings during followup on this bulletin is discussed in paragraph 8 of this report. The SRI also reviewed CN 1280C/CWP 84-219, "Repair Some Masonry Block Walls." This CN is in progress and consists of (1) repairs to masonry block walls which had been modified from their original state (e.g., blocks removed or loosened, abandoned holes drilled through walls, mortar removal, etc.), and (2) performance of an engineering evaluation on discrepancies between CNs 1280 and 1280A and as-built construction. The CN evaluation concluded that none of the discrepancies jeopardized the structural integrity of the wall.

No violations or deviations were identified.

7. Control Rod Drive (CRD) Event Followup

Due to the safety significance of the event which occurred on June 23, 1984, as documented in NRC Inspection Reports 84-18, 84-22, and 84-26, the SRI spent considerable inspection effort in this area. The following is a summary of the SRI's observations for this reporting period:

On October 6, 1984, CRD 26 was removed from the west port of the hot service facility (HSF) and placed in equipment storage well (ESW) 6. Attempts to ultrasonically clean its shim motor bearings were unsuccessful. A spare shim motor (from CRD 11) was installed and the subsequent back-EMF test failed. This motor was replaced by another spare (from CRD 25) and again failed the back-EMF test. The 200 assembly was then removed and gear train refurbished. The original shim motor was subsequently refurbished using new bearings. RTDs were installed and the orifice position potentiometer was replaced. The orifice valve was found to be stuck. A back-EMF test was acceptable, but additional testing was to be conducted later.

- On October 11, 1984, the SRI observed placement of CRD 25 onto a special work stand in preparation for removal of the cable seal containing the damaged cable section.
- On October 12, 1984, the SRI reviewed CN 1909/CWP 84-234 which was developed to cut access windows in CRD 25 in preparation for cable seal removal.
- On October 15, 1984, the CRD 25 cable seal assemblies were removed by cutting the cable at both sides of the cable seals and removing the seals. Temporary cables were then attached by swage to the remaining cable that was attached to the rods to enable retraction of the absorber strings.
- On October 16, 1984, the SRI visually inspected the cable seals from CRD 25. The seal containing the damaged cable appeared to have one broken cable strand bound up inside the cable seal. The SRI also noted and informed the licensee that the containment for CRD refurbishment continued to reflect poor housekeeping as evidenced by the presence of a crushed high density masonry block and its debris as well as dirt, metal shavings, safety wire, and trash on the deck and work areas.
- On October 17, 1984, CRD 25 was removed from the east port of the HSF and placed in ESW 3. Reassembly was to preclude loss of parts during storage. No as-found as-left data were taken. Refurbishment of the gear train will require bearing preload and shim size verification.
- On October 18, 1984, CRD 26 was removed from ESW 6 and placed in the west port of the HSF. The SRI observed and verified that this movement was performed in accordance with Procedure FHPWP-22, "Fuel Deck Equipment Rearrangement." Shim motors from CRDs 11 and 25 were installed and back-EMF tests were performed. One shim motor (from CRD 25) failed the back-EMF test and the other shim motor (from CRD 11) was determined acceptable.
- October 19, 1984, the original shim motor was installed on CRD 26 and found to have bad brakes. It was replaced by a spare (from CRD 11).
- On October 20, 1984, CRD 26 was removed from the HSF and placed in ESW 6. Extensive cable examinations had been conducted using a stereo microscope from which corrosion products and pitting of the cable were identified. The orifice valve problem still has to be resolved for this CRD.
- On October 22, 1984, CRD 21 was removed from ESW 5 and placed in the west port of the HSF for stereo microscope examination of the cables and refurbishment of its shim motor.
- On October 23, 1984, the shim motor for CRD 21 was refurbished inside the CRD refurbishment containment.

On October 24, 1984, the SRI reviewed a note from the swing shift crew, which refurbished the CRD 21 shim motor, to the day shift crew stating, in part, "Started assembly, got to the point it is now and found the washers that go between the double bearings. . . P.S. Next disassembly keep track of the little dowels, we finally found them on the floor, the key on the shaft was misplaced too . . . " On questioning the quality of this maintenance activity, the SRI reviewed MP 12-12, "Maintenance and Repair of Control Rod Drive," Issue 2, Section 4.4, "Assembly of Shim Motor and Brake Assembly," that had been issued for this activity and verified that none of the MQC hold and witness points as well as the workman's steps had been signed/checked. The SRI informed the licensee of this apparent loss of quality control. MQC issued a nonconformance report (NCR 84-305) documenting the loss of quality control.

The shim motor was taken to another area (a hooded clean area where refurbishment of shim motors normally takes place) to disassemble and properly reassemble the motor and brake assembly.

During disassembly the epoxy on the stator was found badly chipped with windings showing through. NCR 84-307, documenting this, indicated a possible cause to be the use of force to seat the end bell. Disposition of the NCR was to replace the stator. A spare stator of unknown condition was used resulting in NCR 84-309 due to uncontrolled storage and the inability to verify its operability.

- On October 25, 1984, the SRI observed a portion of the CRD 21 shim motor assembly, during which the slinger nut was galled to the shaft of the rotor. NCR 84-310 documented this and stated the cause to be reuse of the slinger nut apparently without the use of a tap and die to clean the threads. Apparently this was a repeat occurrence. A sample (148 grams) of reserve shutdown (RSD) material was removed from this CRDOA.
- On October 26, 1984, CRD 21 was removed from the west port of the HSF and temporarily stored in ESW 5 without a shim motor installed because no replacement slinger nuts were available. CRD 26 was removed from ESW 6 and placed in the west port of the HSF to obtain a RSD material sample. CRD 26 was then returned to ESW 6.

Followup to the loss of quality control problem above indicated the following:

The licensee stated that refurbishment of the shim motor was accomplished by two maintenance apprentices inside the containment with their foreman and the MQC inspector observing from outside. The apprentices supposedly were using a copy of MP 12-12 inside the containment and checking off the steps as they performed them. Subsequent followup by the licensee indicated that only the first 4 steps out of approximately 26 were found checked. At the end of the shift apparently both the maintenance crew and the MQC inspector

realized, upon finding the washers, that the apprentices had overlooked the step requiring insertion of the washers and had failed to sign the original copy of MP 12-12 for the work they had performed. Their decision was to not sign the steps since disassembly and reassembly would again be required.

• The licensee also informed the SRI that the MQC inspector involved had previously been involved in a similar problem for which disciplinary action had been taken (i.e., Violation 8414-04). He has subsequently been removed from inspection efforts in this area.

The licensee was informed that the failure to follow procedures for this quality related activity is considered a violation (8429-02).

The licensee was also informed of the SRI's concerns about the quality of maintenance during the CRD refurbishment program. A number of indications of poor quality maintenance activities were discussed.

- a. The WRI reviewed specific instances involving NCRs:
 - Problems with CRD 44 during disassembly/assembly that finally resulted in identifying the need for a new procedure as documented in NRC Inspection Report 84-22. CRD 44 had apparently been disassembled four times. NCRs 84-240 and -241 were written to address loss of component control for CRDs 14, 44, and 18.
 - NCR 84-245 documenting over torqueing of guide pulley locknuts.
 - · NCRs 84-277, -278 documenting peening over of shim motor shafts.
 - NCR 84-305 documenting loss of QC during shim motor assembly.
 - NCR 84-307 documenting stator damage during reassembly.
 - NCR 84-309 documenting use of spare stator whose storage was uncontrolled and operability questioned.
 - NCR 84-310 documenting slinger nut galling on the rotor shaft caused by re-use without cleaning the threads.
- b. The SRI noted instances of poor housekeeping:
 - Nuts, bolts, washers, lockwire, etc., scattered around on the deck and work areas.
 - Excessive amounts of dirt and debris noted and reported to the licensee at different times.
 - The event reported above involving the crushed masonry block.

- c. The SRI noted observations of poor work practices:
 - Congested work space caused in part by the failure to suspend air hoses and remove unused equipment from the work area.
 - Use of the CRD assembly itself for tool storage during work activities. (e.g., screwdrivers, safety-wire, safety-wire pliers, solder, solder gun, etc., stuck on top of and in the 600 assembly while working on refurbishment of the 200 assembly.)
 - Refurbishment being performed on top of an unprotected painted work bench with evidence that paint had been scratched off by the component for which cleanliness control was critical.
 - Loss of parts during disassembly.

The SRI pointed out that problems such as these could impact the quality of CRD refurbishment.

8. Design Control

This section documents the SRI's findings concerning unresolved item 8422-05, identified previously in NRC Inspection Report 84-22, concerning the use of "engineering judgement" as a deviation report (DR) or field change justification without supportive design and design verification documentation.

The licensee's plant modifications are controlled by a change notice (CN). The approval and release of CN authorizes preparation of a CWP. The CWP is a work plan that reflects the requirements of the job and includes detailed work instructions for such items as prefabrication, fabrications, welding, nondestructive examinations, inspections, cleaning, testing, installation, and other pertinent work activities. If during CN implementation, it was determined that a deviation from the design or installation instructions was required, a DR could be processed using a CWP-DR provided that:

- The materials and components as specified in the CN are not compromised. Materials and components may be substituted if the substitutions meet or exceed the requirements set forth in the CN.
- The design intent, process flows, and/or safety evaluation as specified in the CN are not altered.

The SRI reviewed a sample of eight closed CNs some of which included numerous reissues.

The SRI also reviewed the licensee's computer listing of CNs which indicated that 255 CNs had been implemented but were open pending completion of the as-built verification (ABV), the licensee's process used

to determine if the as-built condition met the original design intent of the CN. Out of the 255 CNs, 113 were identified as having had field changes made during implementation of the CWP.

The review of a sample of closed CNs was performed to verify adherence to administrative procedures and QA program requirements.

Licensee procedures ENG-1, "Procedure for Control of Changes and Modifications," Q-3, "Design Control System," and G-9, "Controlled Work Procedures," each describe various elements of the design change process and the administrative requirements for controlling design changes. The SRI determined that the following administrative requirements contained in these procedures were not met:

- The construction completion notification form for one design change (CN 1629/1629A) did not reference the NCRs issued during the modification process;
- The cover page for one reissued design change (CN 1444A) did not indicate a change to the design background information package; in addition, this CN contained documentation of a change to two hangers (90-HA-3076 and 3077) which were not specifically authorized under this CN, although subsequent reinspection verified the hangers to be of an appropriate design;
- No records could be located of the CWP (82-58) which was used in one design change (1436B); and
- Reissues of one CN (1436) did not update information that was changed by field changes (DR-81-19-1 and DR-82-45-1-c).

These failures to observe administrative requirements for design changes constitutes an apparent violation of NRC requirements (8429-03).

In his review, the SRI also determined that QA requirements were not followed for modifications performed under CN 1629 and CN 1436 in that field design changes (DR-83-150-1-I and DR-82-19-1-B) were allowed based on engineering judgement and no independent design verification was performed. This constitutes an apparent violation of NRC requirements (8429-04).

Of particular concern in this area is that the QA requirement for design/design verification had previously been identified as a possible item of noncompliance by the licensee's own QA organization as early as 1982. The PSC QA department had previously required FSV contractors working on major modifications, such as the Loop Split Outage and construction of Building 10, to perform design/design verifications prior to the return to service of systems modified by the loop split and prior to declaring Building 10 complete. However, this requirement, previously identified by the PSC QA department, had not been resolved with the PSC nuclear engineering department. As identified in previous NRC inspection

reports, this inability to quickly resolve quality problems with NED is an indicator of an apparent weakness in the effectiveness of the QA organization.

The SRI had no further questions in this area.

9. Independent Inspection

a. QA Program on Transport Packages

From a review of IE Information Notice 84-50, "Clarification of Scope of Quality Assurance Programs for Transport Packages Pursuant to 10 CFR 50, Appendix B," and discussions with the NRC staff, the SRI determined that the licensee had not applied their QA audit program to transport packages as required. This item was turned over to a Region IV facilities radiological protection inspector. His findings are documented in NRC Inspection Report 84-28.

b. TMI Action Item II.F.1.(3)

From a review of SR 5.4.9-A4, "High Range Area Monitors Calibration," Issue 2, dated March 9, 1984, the SRI determined that the high range detector RT 93250-14 was not being calibrated by a calibrated source for at least one decade below 10 R/hr as required by NUREG 0737. The licensee was informed that this is considered an unresolved item (8429-05) to be resolved by the Region IV Facilities Radiological Protection Section.

No violations or deviations were identified.

11. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether or not the items are acceptable, violations, or deviations. The following unresolved item is discussed in this report:

Paragraph	<u>Item</u>	Subject
9	8429-05	Radiation Detector Calibration

12. Report Reviews

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

Monthly Operations Report for the month of September 1984
No violations or deviations were identified.

12. 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.