

PUBLIC SERVICE COMPANY OF COLORADO  
FORT ST. VRAIN NUCLEAR GENERATING STATION

ANNUAL REPORT OF CHANGES, TESTS, AND EXPERIMENTS  
NOT REQUIRING PRIOR COMMISSION APPROVAL PURSUANT  
TO 10CFR50.59

January 23, 1987 through January 22, 1988

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## INTRODUCTION

This report is submitted to comply with the requirements of Part 50.59 of Title 10, Code of Federal Regulations (10CFR50.59) as they apply to Fort St. Vrain Nuclear Generating Station, Unit No. 1. It includes the period of January 23, 1987, through January 22, 1988.

The following definitions of major terms used in this report may be helpful:

Change Notice (CN) - A document containing installation, inspection and testing requirements, design background information, and design document updating requirements which specify the design control requirements applicable to a plant modification and authorizes changes to "as-built" plant design documentation.

Document Change Notice (DCN) - A document which, when approved, authorizes a change to design documents. As a minimum it contains a design input statement, a design analysis statement, a document update list and the document update information.

T-Tests - Special tests proposed and conducted by Public Service Company of Colorado.

In this report, the safety evaluation for the changes, tests, and experiments are summarized. The terminology used in these summaries is defined as follows:

### Safety Related

Those Plant systems, structures, equipment and components which are identified by the FSAR and as detailed and supplemented by applicable P&I, IB and IC diagrams, E and E-1203 schematic diagrams, the Cable Tab and SR-6-2 and SR-6-8 lists to include the following:

- a) Class I per the FSAR, Table 1.4-1.
- b) Safe shutdown components per the FSAR, Table 1.4-2.
- c) Alternate Cooling Method (ACM) equipment.
- d) Interface circuits (IC) within the EQ Program.

### Safety Significant

Changes to the facility, systems, components, or structures as described in the FSAR that may do any one of the following:

- a) Affect their capability to prevent or mitigate the consequences of accidents described in the FSAR.
- b) Could result in exposures to plant personnel in excess of occupational limits.

Changes in the safety related systems which involve the addition, deletion or repair of components, structures, equipment or systems such that the original design intent is changed (i.e., changes in redundancy, performance characteristics, separation, circuitry logic, control, margins of safety, safe shutdown, accident analysis or any change that would result in an unreviewed safety question or require a Technical Specification change).

### Unreviewed Safety Question

Any plant modification or activity that is deemed to involve an unreviewed safety question as defined in 10CFR50.59:

- a) if the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR may be increased; or
- b) if a possibility for an accident or malfunction of a different type than any evaluated previously in the FSAR may be created; or
- c) if the margin of safety as defined in the basis for any technical specification is reduced.

## 1.0 PUBLIC SERVICE COMPANY CHANGE NOTICES (CN)

### CN-1622F

#### System 92/Accessory Electrical Equipment

This CN authorized the change which modified the DC controls associated with under-voltage protection. The change provided redundant control power to the under-voltage system. It reassigned the Standby Diesel Generator start signals for degraded and loss of voltage relays to ensure occurrence of the automatic safety actions while not compromising the capability for manual safety actions. It added interlocks within the 480 VAC bus tie breaker circuits for degraded voltage conditions similar to that which exist for a loss of voltage condition. These changes do not adversely affect safe operation of the plant or the operation of the Plant Protective System or the Standby Diesel Generators.

FSAR section 8.2.5.2 and figures 7.1-14 and 8.2-14 have been revised to reflect this change. This activity was safety related and safety significant, but did not involve an unreviewed safety question.

### CN-1899, 1899A

#### System 45/Fire Protection System System 46/Reactor Plant Cooling Water System System 75/Turbine Building

This CN authorized the change which modified the Control Room furnishings and arrangement. The change provided improved arrangement, better access control, improved storage, noise reduction, and improved operator comfort. The change did not compromise performance or protection associated with the control room. The change enhances the operators' effectiveness in their performance based on human factor considerations.

FSAR figures 1.2-17, 3.6-3, and 8.2-15 were revised to reflect this change. This activity was safety related and safety significant, but did not involve an unreviewed safety question.

CN-1986A

System 12/Control Rods and Drives

This CN authorized the change which incorporated corrections to Control Rod Drive and Orifice Assembly drawings and documents to reflect the "as-built" configuration. No plant design functions were altered by this change. No physical modification to the plant was involved.

FSAR figures 3.8-10 and 3.9-2 have been revised to reflect this change. This activity was safety related but was not safety significant and did not involve an unreviewed safety question.

CN-2003B

System 45/Fire Protection System  
System 92/Accessory Electrical Equipment

This CN authorized the change which re-routed fire panel terminations, power feed cables, and control room annunciation cables. This change was made to meet the separation requirements of 10CFR50 Appendix R. This change did not adversely affect safe operation of the plant.

FSAR figure 8.2-17 has been revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2007

System 48/Alternate Cooling Method (ACM)  
System 73/Reactor Plant Ventilation System

This CN authorized the change which re-routed the power feed cables for Reactor Plant Exhaust Fans 1A and 1B, and for the ACM. This change was made to meet the separation requirements of 10CFR50 Appendix R. This change did not adversely affect safe operation of the plant.

FSAR figure 8.2-10 has been revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2021

System 21/Primary Coolant System

This CN authorized the change which re-routed the power feed cables for Bearing Water Pumps P-2101 and P-2106. This change was made to meet the separation requirement of 10CFR50 Appendix R. This change did not adversely affect safe operation of the plant.

FSAR figure 8.2-9 has been revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2173

System/Various

This CN authorized the change which updated the electrical installation work specification 1-N-2 to incorporate applicable Environmental Qualification (EQ) requirements and current PSC work practices. This change was required to provide the mechanism to install electrical equipment in accordance with EQ installation criteria. It did not degrade the equipment installed per previous criteria. No physical modification to the plant was involved.

FSAR section 8.2.7.3 was revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2181

System 22/Secondary Coolant System  
System 52/Turbine Steam  
System 53/Extraction Steam

This CN authorized the change which installed a portion of the overall Steam Line Rupture Detection/Isolation System (SLRDIS). The system is designed to detect and automatically isolate High Energy Line Breaks in the secondary coolant system. This action ensures building environments do not exceed the environmental qualification of Class 1E equipment. This CN was one of several CNs associated with SLRDIS. This change provided selected valve control circuit redundancy and circuit completion to control relays. This change did not adversely affect safe operation of the plant. Connection to the Plant Protection System was authorized by another CN which required a Technical Specification change.

Various FSAR sections and figures have been revised to describe and show the actions and location of the SLRDIS. This activity was safety related, but was determined not to be safety significant and did not involve an unreviewed safety question.

CN-2190

System 93/Controls and Instrumentation

This CN authorized one of the changes associated with the Steam Line Rupture Detection/Isolation System (SLRDIS). The system is designed to detect and automatically isolate High Energy Line Breaks in the secondary coolant system. This action ensures building environments do not exceed the environmental qualification of Class 1E equipment. This CN is one of several CNs associated with SLRDIS. This change modified the control circuit to specific valves to close upon receiving a signal initiated by SLRDIS. This change did not adversely affect safe operation of the plant. Connection to the Plant Protection System was authorized by another CN which required a Technical Specification change.

Various FSAR sections and figures have been revised to describe and show the actions and location of the SLRDIS. This activity was safety related, but was determined not to be safety significant and did not involve an unreviewed safety question.

CN-2255

System 92/Accessory Electrical Equipment  
System 93/Controls and Instrumentation

This CN authorized the change which updated the safety related data base to incorporate corrections identified by various internal corrective action requests. This change ensured safety related equipment is properly identified and can be properly maintained. This was a document change only. No physical plant modification was involved.

FSAR figures 8.2-9 and 8.2-10 were revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2271

System 31/Feedwater and Condensate

This CN authorized the change which installed a check valve upstream of the emergency condensate header. This change ensured a pressure boundary exists in case of a turbine building High Energy Line Break. This change did not adversely affect safe operation of the plant.

FSAR figures 10.1-1 and 1.2-1 have been revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2283

System 93/Controls and Instrumentation

This CN authorized the change which installed an additional Steam Line Rupture Detection/Isolation System (SLRDIS) panel in the Control Room and thermistors in the reactor and turbine buildings. The system is designed to detect and automatically isolate High Energy Line Breaks in the secondary coolant system. This action ensures building environments do not exceed the environmental qualification of Class 1E equipment. This CN is one of several CNs associated with SLRDIS. This change did not adversely affect safe operation of the plant. Connection to the Plant Protection System was authorized by another CN which required a Technical Specification change.

Various FSAR sections and figures have been revised to describe and show the actions and location of the SLRDIS. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2284

System 52/Turbine Steam

This CN authorized the change which installed an eight-inch line and valve which provided an exit flow path from the steam generator Economizer-Evaporator-Superheater via the bypass flash tank when using fire water. Analysis had shown that the existing discharge path was inadequate following a High Energy Line Break. This change increased the size of the flow path and permitted its utilization without entering a harsh environment. This new exit flow path was installed on the bypass flash tank but is not relied upon for safe shutdown cooling. (The six inch exit flow paths installed per separate CN's are relied upon for safe shutdown cooling.) This change did not adversely affect safe operation of the plant.

FSAR figures 10.1-1 and 1.2-1 were revised to reflect this change. This activity was safety related and safety significant, but did not involve an unreviewed safety question.

CN-2298, CN-2298A

System 75/Turbine Building

This CN authorized the change which modified masonry block walls #2 and #3 to better withstand the postulated pressures associated with a High Energy Line Break (HELB). The reinforcement straps were replaced with larger straps to increase the lateral load capacity of the walls. The CN analyzed associated doors in the turbine building and found them acceptable in withstanding the overpressure conditions resulting from a postulated HELB. Therefore, the capabilities of the turbine building to withstand a HELB have been enhanced. This change did not adversely affect safe operation of the plant.

FSAR section 14.5.1.1 was revised to reflect this change. This activity was safety related and safety significant, but did not involve an unreviewed safety question.

CN-2313

System 72/Reactor Building

This CN authorized the change which modified the reactor building sump discharge piping. A dual train 3-stage filtration system was installed to provide improved capabilities to monitor effluent from the reactor building sump. This modification improved the filtration system for the temporary in line Beta monitoring of the effluent from the reactor building sump. This change did not adversely affect safe operation of the plant.

FSAR section 11.1.2.2 has been revised to include a description of the filtration system. This activity was not safety related or safety significant and did not involve an unreviewed safety question.

CN-2332

System 75/Turbine Building

This CN authorized the change which modified the turbine building ventilation system to provide improved air flow to the battery rooms. Air supply was tapped off the 480 VAC switchgear supply duct without any increase in the 480 VAC switchgear room temperature. This change did not adversely affect safe operation of the plant.

FSAR figure 7.4-1 has been revised to reflect this change. This activity was safety related, but it was not safety significant and did not involve an unreviewed safety question.

CN-2340, 2340A

System 11/Prestressed Concrete Reactor Vessel (PCRVR)  
System 23/Helium Purification System  
System 93/Controls and Instrumentation

This CN authorized the change which installed a primary coolant sample line from the upper plenum of the PCRVR to the Analytical Instrumentation Panel. This sample line was installed to meet the requirements of NUREG-0737, Item II.b.3. It will be utilized to verify core conditions following postulated accidents. This change did not adversely affect safe operation of the plant.

FSAR section 7.3.4 and Criterion C.53 were modified to reflect this change. This activity was safety related, but it was not safety significant and did not involve an unreviewed safety question.

CN-2397, CN-2412

System 22/Secondary Coolant System

These Change Notices installed six inch vent lines off the Loop I and Loop II main steam headers at the outlet of the steam generator Evaporator-Economizer-Superheater sections of the steam generators. These changes were associated with a change to LCO 4.3.1 submitted to the NRC under letter P-87002, and approved as Amendment No. 55 to the Technical Specifications.

These Change Notices revised FSAR section 10.3.9 and figures 10.1-1 and 1.2-1. The changes were safety related and safety significant, but not an unreviewed safety question.

CN-2424

System 21/Primary Coolant System  
System 45/Fire Protection System

This CN authorized the change which installed redundant valves to System 21 and System 45 piping to ensure one fire water and one safe shutdown path exist in the event of a single passive failure of either existing or the additional valves. Licensing Event Report 86-021 identified three safe shutdown cooling valves as single failure points. These points could disable both redundant flow paths of the fire protection system. This change was required to meet the single passive failure criteria described in FSAR section 9.12.4. This change did not adversely affect safe operation of the plant.

FSAR figures 9.12-1 and 9.12-2 were revised to reflect this change. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2537

System 22/Secondary Coolant System

This CN authorized the change which installed local pressure gauges in the main steam vent lines. The existing instrumentation was not sufficiently accurate to monitor subcooling margin during a safe shutdown cooling event. This change, in conjunction with installation of the local temperature indications and the main steam six inch exit flow paths, is required to mitigate the consequences of Design Basis Accidents and recovery from a Steam Line Rupture Detection/Isolation System actuation within the specified time interval. This change did not adversely affect safe operation of the plant. Note that the CN to install the six inch exit flow paths required a change to the Fort St. Vrain Technical Specifications.

FSAR sections 10.3.9 and 10.3.10 and figure 10.3-9 have been revised to reflect this change. This activity was safety related and safety significant but did not involve an unreviewed safety question.

CN-2593

System 12/Control Rods and Drives  
System 93/Controls and Instrumentation

This CN authorized the change which installed zero-crossing voltage networks on Control Rod Drive and Orifice Assembly "in" and "out" circuits to suppress voltage transient spikes. These spikes produced noise spikes in the Nuclear Instrumentation start-up and wide range channels. This change reduced the spurious actuation of nuclear instrumentation channels caused by noise spikes. This change did not adversely affect safe operation of the plant.

FSAR figure 7.2-5 was revised to reflect this change. This activity was safety related but was not safety significant and did not involve an unreviewed safety question.

CN-2648

System 48/Alternate Cooling Method (ACM)  
System 75/Turbine Building

This CN authorized the change which relocated the ACM transfer switch for the diesel driven fire water pump vent fan, C-7522. The switch was relocated to the Diesel Driven Fire Pump Room. The relocation ensured a single fire in the Electric Motor Driven Fire Water Pump Room will not disable equipment associated with both the electric and diesel drive pumps. This change enhanced the capability of the fire water pump to prevent or mitigate the consequence of an accident. This change did not adversely affect safe operation of the plant.

FSAR tables 1.4-1 and 1.4-2 were revised to reflect this change. This activity was safety related and safety significant but did not involve an unreviewed safety question.

CN-2658

System 22/Secondary Coolant System

This CN authorized the change which modified the cold reheat steam attemperation control system. The attemperation flow switch input was modified such that an input signal from the turbine trip/runback bias module was received. This change reduced the potential for high hot reheat steam temperature scrams following turbine trip or runback events. This change did not adversely affect safe operation of the plant.

FSAR sections 4.2.4.2.2, 10.1.5, 10.1.5.1, 10.1.5.2, 10.1.5.2.1, 10.1.5.2.2, 10.1.5.2.3, and I.10; figure 10.1-2, and table H.2-1 were revised to reflect this change and to clarify cold reheat steam attemperation. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

CN-2673

System 92/Accessory Electrical Equipment

This CN authorized the change which incorporated "as-built" information on the 120 VAC distribution panels. This change ensured documentation appropriately contains information and references to support reliable maintenance, design, operation and quality control. This activity was a document change only based on field verified "as-built" configuration.

FSAR figures 8.2-15, 8.2-17 and 8.2-20 were revised to reflect this change. This activity was safety related but was not safety significant and did not involve an unreviewed safety question.

## 2.0 PUBLIC SERVICE COMPANY DOCUMENT CHANGE NOTICES (DCN)

### DCN-39

#### System 16/Auxiliary Equipment

This DCN authorized the change which documented the tagging of the equipment storage well shielding adapters. The assigned tag numbers enabled differentiation between the two shielding adapters.

FSAR figure 1.2-15 was revised to reflect this change. This activity was not safety related, it was not safety significant and it did not involve an unreviewed safety question.

### 3.0 PUBLIC SERVICE COMPANY OF COLORADO T-TESTS

#### T-289

##### System 12/Control Rods and Drives

Purpose: To determine Control Rod Drive (CRD) motor bearing life expectancy using an actual CRD motor in a test apparatus.

This test installed bearings in a CRD motor mounted on a test rig. The test was performed in a helium filled autoclave in the Fuel Storage Building. This test demonstrated the bearings had adequate lubricating characteristics and load capacities to meet the requirements of service duty in a CRD motor. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

#### T-290

##### System 12/Control Rods and Drives

Purpose: To determine shim motor bearing life expectancy using an actual Control Rod Drive and Orifice Assembly (CRDOA).

A CRDOA with replacement bearings was operated 1000 times in a helium filled equipment storage well. The test demonstrated that replacement CRDOA bearings under actual load and duty cycles yielded satisfactory cyclic lives for the requirements of in-service installation. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-311

System 93/Controls and Instrumentation

Purpose: To investigate if any operational problems with the Steam Line Rupture Detection/Isolation System (SLRDIS) exist, such as a rate of rise alarm caused by the opening and closing of the railroad access doors in the turbine building.

This test monitored the performance of the SLRDIS system over a one month period. The SLRDIS output contacts were inhibited to ensure that audible alarms did not occur. The system itself was not in service. No unusual events occurred during the month of observation. This test was safety related but it was not safety significant and did not involve an unreviewed safety question.

T-313

System 93/Controls and Instrumentation

Purpose: To subject the Environmentally Qualified Foxboro N-series process transmitters to a 100 hour burn-in test prior to field installation.

This was a bench test to determine instrument drift over the 100 hour burn-in period. An engineering evaluation based on test results was performed to determine instrument acceptability prior to installation in plant systems. This test was safety related, but was not safety significant and did not involve an unreviewed safety question. The test was instrumental in finding several defective transmitters which were repaired prior to installation.

T-320

System 93/Controls and Instrumentation

Purpose: To investigate the noise sensitivity of the Nuclear Instrumentation Start-up Channels.

This test was abandoned before its completion in favor of attempting to locate, by other means, the noise source problems which were causing spurious trips of Nuclear Instrumentation channels. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-325

System 92/Accessory Electrical Equipment

Purpose: To measure the time required for each Standby Diesel Generator (SDG) to reach rated frequency and voltage.

This test demonstrated that the SDGs are capable of attaining rated voltage and frequency within 10 seconds as suggested by Regulatory Guide 1.108. This test was performed in conjunction with Technical Specification Surveillance SR 5.6.1.a-W. The SDGs were started several times with all four air start motors (two per engine) available and once with only two air start motors (one per engine) available to simulate actual auto-start conditions. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-330

System 31/Feedwater and Condensate  
System 45/Fire Protection System

Purpose: To determine the amount of time required to install the removable spool piece, M-3129, between System 45 and the emergency feedwater header under simulated emergency conditions.

This one-time test demonstrated the capability to install the removable spool piece in forty minutes. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-332

System 21/Primary Coolant System

Purpose: To measure the energized temperature of a Paul-Munroe solenoid valve, HSV-2112-4.

This test energized and after two hours measured the body temperature of solenoid valve HSV-2112-4 to be 122.8 degrees F with an ambient temperature of 72.6 degrees F. This data was used to support Environmental Qualification data. No system design or system operation was altered. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-335

System 82/Instrument and Service Air

Purpose: To measure the number of operational cycles of PS-8211-3 on Instrument Air Compressor 1B in a 24 hour period.

The test counted 525 cycles over a 24 hour period. This test did not change the operation of the system. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-338

System 21/Primary Coolant System

Purpose: To verify that SV-2111 can be opened locally when it is receiving a trip signal in order to meet 10CFR50 Appendix R requirements.

The test demonstrated that it was not possible to manually open the valve under test. This test verified the need to install hydraulic accumulators on similar valves FV-2205 and FV-2206 such that they can be opened locally. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-339, T-343

System 12/Control Rods and Drives

System 93/Controls and Instrumentation

Purpose: To investigate the effectiveness of zero-crossing switches to eliminate spurious Rod Withdrawal Prohibit alarms.

The tests verified the effectiveness of zero-crossing switches to prevent inductive switching transients. All control rods were fully inserted and all Control Rod Drive breakers were racked out at the time of the tests. These tests were safety related, but were not safety significant and did not involve an unreviewed safety question.

T-340

System 93/Controls and Instrumentation

Purpose: To verify the effectiveness of a modification to temperature transmitters to eliminate susceptibility to FM type frequencies. The temperature transmitters were activated by high frequencies which were causing spurious trips. Licensee Event Report 86-029 reported reactor building high temperature scrams caused by the unmodified transmitter. Note that a CN authorized the modification.

The modified transmitters did not respond to FM radio transmissions during the test. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-342

System 23/Helium Purification System

Purpose: To verify proper operation of the circuitry associated with Helium Purification Train inlet valves HV-2301 and HV-2302. This was in response to a commitment contained in PSC letter, Gahm to Berkow, dated 12/19/86, (P-86669) and Licensee Event Report 86-017.

The test inserted a trip signal upstream of the valve with the reactor pressurized. No protective functions were disabled. All trip circuits functioned as designed. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-344

System 12/Control Rods and Drives

Purpose: To investigate the effectiveness of various mounting and stiffening techniques to reduce mechanical resonance. This potentially could cause actuation of relays on the Control Rod Drive (CRD) Motor starter panels in MCC-1 and MCC-2. This test was performed in response to open items associated with Licensee Event Reports 86-004 and 86-015.

The test determined effective means to eliminate the mechanical resonance of the CRD motor starter panels. The CRD breakers and the relay wiring were de-energized and the reactor was shutdown at the time of the test. This test was determined to be safety related, but was not safety significant and did not involve an unreviewed safety question.

T-346

System 31/Feedwater and Condensate

Purpose: To measure the required condensate flow for safe shutdown cooling to one or more helium circulator pelton wheels to obtain 3.8% primary coolant flow. This test was initiated to address NRC concerns prior to securing the release to operate at 82% power. Results of the test were documented in PSC letter, Brey to Calvo, dated May 4, 1987, (P-87171).

All but the one helium circulator under test were shutdown and the flow to both steam generators was stopped during the test. Decay heat calculations per Core Management Guide for Calculated Bulk Core Temperature, CMG-4, were observed. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-347

System 93/Controls and Instrumentation

Purpose: To verify the first-in-with-lockout circuits for the Plant Protection System (PPS) loop shutdown logic operate properly. This circuitry ensures both secondary coolant loops cannot be shutdown simultaneously. This test was performed as a result of Licensee Event Report 87-008.

This test demonstrated the PPS first-in-with-lockout circuit Two-Loop Trouble Scram operated properly. The reactor was shutdown and low decay heat was present at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-348

System 22/Secondary Coolant System  
System 91/Hydraulic Power System

Purpose: To measure hydraulic oil pressure transients associated with stroking valve HV-2292. This test was performed subsequent to the turbine building fire to obtain functional data on this valve. This test was performed as an internal commitment to investigate System 91 thermal relief valve failures.

This test obtained data which was analyzed to increase the level of understanding of the hydraulic power system pressure surges. The operation and function of the valve under test was not altered by this test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-349

System 21/Primary Coolant System

Purpose: To investigate excessive current being drawn by Emergency Water Booster Pumps P-2109 and P-2110.

This test monitored the current of these pumps. There were no abnormal modes of operation involved with this test. During the test it was discovered that an incorrect valve line up caused excessive current to be drawn. This test demonstrated the pumps capacities were adequate to meet the required flow for safe shutdown cooling with fire water. This test was determined to be safety related, but was not safety significant and did not involve an unreviewed safety question.

T-351

System 92/Accessory Electrical Equipment

Purpose: To investigate alleged anomalies associated with starting the Standby Diesel Generator (SDG) set 1A when the exhaust temperature switches were above their setpoint of 180 degrees F.

This test demonstrated the capability of the SDG to start with the exhaust temperature switches above the 180 degree F reset point. The exhaust temperature was measured during the performance of Technical Specification Surveillance SR-5.6.1a-W. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-352

System 82/Instrument and Service Air

Purpose: To investigate potential setpoint drift associated with the Static-O-Ring loader/unloader pressure switches on the Instrument Air Compressors.

This test verified excessive setpoint drift associated with the pressure switches over a ninety day period. The operation or function of the switches was not altered for the purpose of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question. Note that a CN authorized the replacement of these pressure switches with mechanical unloader pilot valves.

T-355

System 45/Fire Protection System

Purpose: To establish a set of reference conditions for Fire Water Pump P-4501, using the guidance of ASME Section XI, Division 2, 1983 edition. This test was performed based on NRC approval of Amendment 51 to Facility Operating License No. DPR-34, dated March 9, 1987 (G-87073).

This test demonstrated the pump was capable of developing a 1425 gpm flow rate at a discharge pressure of 119 psig. This test placed the plant in a grace period per LCO 4.2.6, which is allowed by the Technical Specifications for the purpose of such tests. The pump could have been returned to service any time during the test, if required. The data from this test will be used to evaluate pump degradation and operability. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-357

System 21/Primary Coolant System

Purpose: To establish a set of reference conditions for Emergency Bearing Water Makeup Pump P-2108, using the guidance of ASME Section XI, Division 2, 1983 edition. This test was performed based on NRC Approval of Amendment 51 to Facility Operating License No. DPR-34, dated March 9, 1987 (G-87073).

This test demonstrated the pump was capable of developing a 35 gpm flow rate at a discharge pressure of 850 to 950 psig. Operation of the plant with one bearing water makeup pump is allowed for up to 24 hours per LCO 4.2.2. The data from this test will be used to evaluate pump degradation and operability. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-358

System 21/Primary Coolant System

Purpose: To establish a set of reference conditions for Bearing Water Makeup Pump P-2105 using the guidance of ASME Section XI, Division 2, 1983 edition. This test was performed based on NRC Approval of Amendment 51 to Facility Operating License No. DPR-34, dated March 9, 1987 (G-87073).

This test demonstrated the pump was capable of maintaining an acceptable discharge pressure and flow rate. Also, this test verified the acceptable performance of the pump when operating in the recycle mode. Operation of the plant with one bearing water makeup pump is allowed for up to 24 hours per LCO 4.2.2. The data from this test will be used to evaluate pump degradation and operability. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-360

System 93/Controls and Instrumentation

Purpose: To demonstrate the absence of abnormal Plant Protection System (PPS) trip inputs interlocked with the Interlock Sequence Switch (ISS). This was performed after correcting improper wiring configuration discovered subsequent to Licensee Event Report 87-015.

This test demonstrated the PPS was free of any abnormal trip inputs interlocked with the ISS. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-363, T-364, T-366

System 21/Primary Coolant System

Purpose: To demonstrate the operability of all four helium circulators following the overhaul of "D" Helium Circulator.

T-363 consisted of shutting down each circulator for 90 minutes, restarting each circulator, recording whether each could self turbine and then running each to maximum speed on pelton wheel drive supplied by unboosted condensate and recording the results. The "B", "C", and "D" helium circulators all performed similarly, which was very close to the expected performance. The "A" helium circulator performed at 75% of the speed of the other circulators which was considered unacceptable.

T-364 ran both "A" and "B" helium circulators on steam at various speeds, independently and in parallel for comparison. Coast down data was also observed, to indicate any additional problems that may not have been previously known. The test results indicated that nozzle blockage associated with the pelton wheel for helium circulator "A" existed.

T-366 was a rerun of the applicable portions of T-364 for which "A" helium circulator had failed, after the associated nozzle blockage had been removed. All helium circulators were determined to be operable as a result of this test in conjunction with the results from T-363 and T-364.

These tests were performed in accordance with established plant procedures. These tests were safety related, but were not safety significant and did not involve an unreviewed safety question.

T-367

System 25/Nitrogen System

Purpose: To measure the resistances of level probes to properly calibrate Moisture Monitor Dewar level indicators/controllers LIC-2540 through LIC-2543.

The test results indicated the level probes are sensitive to pressure variations. Since nitrogen supply to the dew point moisture monitors affected two monitors, one low and one high range at a time, each monitor was declared inoperable and placed in the trip mode during the performance of the test. This test was safety related but was not safety significant and did not involve an unreviewed safety question.

T-370

System 21/Primary Coolant System

Purpose: To investigate spurious trips of the "C" helium circulator and to investigate the operation of the circulator on auxiliary steam at below normal operating primary coolant system pressures. This was required as the Technical Specification primary coolant flow requirements are difficult to meet on Pelton-driven helium circulators at low primary coolant system pressures and core support floor leakage rates are unacceptable if primary coolant pressure is raised to the normal operating point on steam drive.

This test consisted of increasing circulator speed in incremental steps at low reactor pressures to duplicate or uncover the source of the spurious trip. Wobble conditions and PPS speed measuring circuits were monitored for anomalous behavior. No anomalies in performance were observed. The reactor was shutdown at the time of the test and depressurized to less than 150 psig. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-371

System 22/Secondary Coolant System

Purpose: To verify the functional performance of the Loop II Main Steam Bypass Block Valve, HV-2292.

This test verified that HV-2292 could be stroked within 10 seconds using HS-2292. Also, the control room indication of valve position was verified. This test was in accordance with the testing specified in Technical Specification Surveillance SR-5.3.4.b2-A. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-372

System 22/Secondary Coolant System

Purpose: To verify the operation of valves closed by loop shutdown that were in the fire area following maintenance and electrical wiring rework. This test was performed to address NRC concerns that an overall test for fire recovery was desirable.

This test demonstrated the capability of the Loop I and Loop II valves to perform their design functions. The reactor was shutdown at the time of the test. This test was safety related, but was not safety significant and did not involve an unreviewed safety question.

T-373

System 21/Primary Coolant System

Purpose: To control the efforts associated with starting "B" helium circulator after the loss of outside power and associated helium circulator trips on 12/7/87 reported in Licensee Event Report 87-028. Following the helium circulator trips, "B" helium circulator anomalies were observed which were related to bearing water flow and pressure. It was assumed there was some type of blockage caused by the firing of the bearing water accumulators.

This test verified the proper operation of "B" helium circulator and its ability to perform its safe shutdown functions. The anomalies associated with the bearing water flow rate could not be repeated as the flow blockage immediately cleared when the helium circulator was started with steam. This lead to the conclusion the blockage was probably a soft resin versus a hard magnetite residue. This test did not alter the operation of the circulator. This test was safety related but was not safety significant and did not involve an unreviewed safety question.

#### 4.0 PUBLIC SERVICE COMPANY PROCEDURES

##### DD-ECI-1, Issue 1

###### System 92/Accessory Electrical Equipment

This is a new procedure which formalized the requirements associated with the plant electrical cable installation and overcurrent protection devices. These requirements were previously included in various PSC and NRC letters, specifically PSC letter, Walker to Denise, dated 6/10/76 (P-76132) and NRC letter, Denise to Walker, dated 6/18/76 (G-76046). This procedure enhanced the overall margin of safety by ensuring adequate controls existed to prevent the potential for compromising safety systems. This was a document change only.

FSAR section 8.2.7.3 was revised to reflect this procedure. This activity was safety related, but was not safety significant and did not involve an unreviewed safety question.

##### SSC-03, Issue 1

System 42/Service Water System  
System 44/Domestic Water System  
System 45/Fire Protection System

This is a new procedure for the recovery from a noncongested cable area fire resulting in an interruption of forced circulation. This procedure ensured the actions necessary to meet the Fire Protection Shutdown/Cooldown models are followed.

FSAR section 9.8.3.2 has been revised to reflect this procedure. This activity was safety related and safety significant, but it did not involve an unreviewed safety question.

SSC-04, Issue 1

System 22/Secondary Coolant System  
System 45/Fire Protection System

This is a new procedure for the recovery from a SLRDIS actuation. This procedure ensured that FSAR requirements are satisfied. This procedure utilized the six inch exit flow paths for venting the secondary coolant exiting from a steam generator Economizer-Evaporator-Superheater to atmosphere and utilized the fire water supply path to the emergency condensate header via 6" L-45276 as part of the SLRDIS actuation recovery. Note that the CN which authorized the six inch exit flow path required a Technical Specification change.

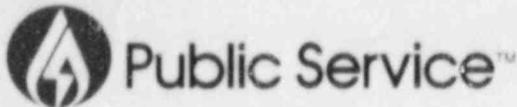
FSAR sections 10.3.9 and 14.4.2.2 have been revised to reflect this procedure. This activity was safety related and safety significant but it did not involve an unreviewed safety question.

SSC-05, Issue 1

System 22/Secondary Coolant System  
System 45/Fire Protection System

This is a new procedure for the recovery from a Design Basis Earthquake (DBE) or Maximum Tornado. This procedure ensured that FSAR requirements are satisfied. This procedure utilized the six inch exit flow paths for venting the secondary coolant exiting a steam generator Economizer-Evaporator-Superheater to atmosphere and utilized the fire water supply path to the emergency condensate header via 6" L-45276 as part of the DBE or maximum tornado recovery.

FSAR sections 10.3.9 and 14.4.2.2 have been revised to reflect this procedure. This activity was safety related and safety significant but it did not involve an unreviewed safety question.



Public Service  
Company of Colorado

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July 22, 1988  
Fort St. Vrain  
Unit No. 1  
P-88193

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Docket No. 50-267

SUBJECT: 10CFR50.59 Annual Report Submittal

REFERENCE: Facility Operating License  
No. DPR-34

Gentlemen:

Enclosed please find the Annual Report of changes, Tests, and Experiments Not Requiring Prior Commission Approval Pursuant to Part 50.59(b) of Title 10, Code of Federal Regulations, for the period of January 23, 1987 through January 22, 1988.

If you have any questions concerning this report, please contact Mr. M. H. Holmes at (303) 480-6960.

Very truly yours,

*H. L. Brey by Milt McBride*

H. L. Brey, Manager  
Nuclear Licensing and  
Resources Management

HLB/JAC/lmb

Enclosures

cc: Regional Administrator, Region IV  
ATTN: Mr. T. F. Westerman, Chief  
Projects Section B

Mr. Robert Farrell  
Senior Resident Inspector  
Fort St. Vrain

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