PUBLIC SERVICE COMPANY OF COLORADO

FORT ST. VRAIN NUCLEAR GENERATING STATION

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

January 1, 1984, through January 22, 1984

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INTRODUCTION

This report is submitted to comply with the requirements of Part 50.59(b) of Title 10, Code of Federal Regulations as they apply to Fort St. Vrain Nuclear Generating Station, Unit No. 1. It includes the period of January 1, 1984, through January 22, 1984.

Some definitions of major terms used in this report which may be helpful:

Change Notice - Modification work proposed and installed by Public Service Company of Colorado.

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

"RT" Tests - Tests proposed by General Atomic Technologies and conducted by Public Service Company of Colorado.

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

Safety Related Items

Those plant systems, structures, equipment, and components which are identified in the FSAR, and as detailed and supplemented by applicable piping and instrument (P & I) diagrams, documents SR-6-2 and SR-6-8, to include the following:

a) Class 1 per the updated FSAR, Tables 1.4-1 and 1.4-3.

b) Safe shutdown components per the updated FSAR, Tables 1.4-2 and 1.4-3.

Safety Significant Change

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) 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.

b) The possibility of an accident or malfunction of a different type than any evaluated previously in the FSAR may be created.

c) The margin of safety as defined in the basis for any Technical Specification is reduced.

1.0 PUBLIC SERVICE COMPANY CHANGE NOTICES

All CN's will be listed in the following order:

First - CN number.
Second - system/component number.
Third - description of the change.
Fourth - summary of safety evaluation.

CN-1255

System 92

This CN upgraded Instrument Power System 1A and 1B. The modification replaced instrument power inverters 1A and 1B, added back-up power transformers to inverters 1A and 1B, installed additional instrument buses 1A-1 and 1B-1 and a three phase static transfer switch in conjunction with Interruptible Instrument Power Bus 3. The new inverters are equipped with static transfer switches for automatic switching between preferred and alternate power systems.

The new inverters, back-up power transformers and power buses were installed in Building 10. The three phase static transfer switch was installed in the 480 Volt Switchgear Room.

Since CN-1255 provided an independent instrument power transformer to provide back-up power for each inverter which provides power to the non-interruptible buses and an associated automatic static transfer switch, the reliability of providing electrical power to vital equipment increased. The possibility of a new accident or malfunction was not created. Increasing the reliability and flexibility of the Non-Interruptible Instrument Power System increased the system's margin of safety.

CN-1294

System 92/45

This modification performed several changes to the 480 Volt Essential Power System. The main project associated with CN-1294 was the electrical connection of the three new, higher capacity 480 Volt essential switchgear. This changeout also included removing the non-essential 4160-480 Volt transformers from within the 480 Volt switchgear room which were replaced with larger units at a location outside of the plant under CN-1605, the electrical connection of current limiting reactors on the eight (8) 480 Volt Motor Control Centers (MCCs) fed from the essential buses, and new fire detection and protection equipment for the new 4160-480 Volt transformers.

Replacement of the switchgear and transformers with new larger capacity equipment will not affect the operation of the plant electrical system with the exception of being less likely to overload the system. Moving the transformers outside will reduce heat problems previously experienced. The probability of occurrence or the consequences of a previously evaluated accident or malfunction or equipment important to safety was not increased. Since the electrical system will not function differently, there has not been any new possible accidents or malfunctions created by this modification. No specific margin of safety is defined in the Technical Specifications or FSAR concerning the capacity of the 480 Volt essential switchgear or transformers. The overall plant margin of safety will be increased by eliminating the heat load within the 3-Room Control Complex and increasing the capacity of the 480 Volt essential switchgear. The current limiting reactors which were placed on the feed to each 480 Volt MCC fed from the 480 Volt essential switchgear were required due to the increase in available interruptible current requirements imposed by the new switchgear.

CN-1332

System 92

This CN upgraded Instrument Power System 1C and replaced the 1D "swing" battery charger. The modification included replacing the 1C battery charger/inverter, installing the old 1D "swing" battery charger as a power source for the new inverter, added a back-up power transformer and an additional Instrument Power Bus 1C-1. The new inverter is equipped with a static transfer switch for automatic switching between preferred and alternate power sources.

The new inverter, old 1D "swing" battery charger, back-up power transformer and power bus were installed in Building 10. The new 1D "swing" battery charger was installed in the 480 Volt Switchgear Room.

This modification increased the capacity and reliability of the Non-Interruptible Instrument Power System 1C. Battery Charger 1D was upgraded and a back-up DC source was made available to the 1C battery charger and inverter. By adding the dedicated back-up power sources and associated automatic switching mechanisms, the possibility of a new accident or malfunction of equipment has not been created. Increasing the reliability and capacity of the instrument power system increases its margin of safety as defined in the Technical Specifications. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR as a result of a non-interruptible power supply failure has been definitely reduced by this modification.

CN-1391

92/DC Power Systems

This CN upgraded Station Batteries 1A, 1B and 1C. The modification included the "in place" replacement of batteries 1A and 1B and the replacement and relocation, to Building 10, of the 1C battery.

The replacement and relocation of battery 1C which is primarily a power source for the non-interruptible instrument bus supplying power to the Plant Protective System did not increase the probability of occurrence of any accident or malfunction evaluated in the FSAR. Since the only physical change to the DC system was replacement of the batteries with new, increased capacity batteries, no possibility of a new accident or malfunction has been created. No margin of safety concerning battery capacity is defined. Since this modification is in the conservative direction by increasing the battery capacities, the modification introduced greater protection from overload and therefore less chance of a DC system failure.

CN-1462

System 70/Building 10

This CN installed the electrical facilities of a new building (Building 10) on site.

This change is not safety significant, and as the change did not increase the probability of an accident or malfunction previously discussed in the FSAR, the change does not involve an unreviewed safety question.

CN-1480

Systems 21/Circulator Buffer Helium Auxiliaries

This modification installed a vent line in the circulator buffer helium system from the discharge of the buffer helium dryer back to the PCRV.

Previous problems existed whenever a complete loop shutdown and isolation occurred and the PCRV pressure changed compared to the buffer helium system pressure of the shutdown loop. If the buffer helium pressure was high compared to the PRCV pressure, upon "restart" of the loop the possibility of water ingress up the circulator shafts was high. Following the installation of this modification, the Reactor Operators have the capability to reduce the buffer helium pressure prior to restart of the isolated loop.

The modification did not create an accident of a different type than any evaluated previously in the FSAR. The modification also did not reduce the margin of safety as evaluated in the Safety Related Design Analysis. The overall system modification does not affect the limiting conditions for plant operation and consequently does not reduce the margin of safety.

CN-1486

System 21/73

This modification installed new piping from the Turbine Water Drain Tank (TWDT) to the Reactor Building Ventilation System.

The installation of the vent piping from the TWDT to the reactor building ventilation system was requested for periods when the circulator turbine water drains have potential primary coolant contamination. This vent line would prohibit the introduction of airborne contamination to the reactor building and redirect this contamination directly to the monitored, filtered reactor building exhaust system.

The redirection of the TWDT vents to the reactor building ventilation system, only during low pressure separator bypass operations or for short intervals when there is a potential for turbine water drain contamination, prevents possible contamination of the reactor building atmosphere. The FSAR only considers the helium circulator return lines (main drain lines) to the TWDT and the turbine water removal pumps to be items whose failure could result in interference with adequate removal of decay heat or pelton cavity drainage, therefore, this modification did not create a different accident or malfunction from those previously analyzed in the FSAR. The ability to drain the pelton wheel cavities on the circulators will not be affected regardless of which vent path is used, therefore, the margin of safety has not been altered.

CN-1605

System 92/4160-480 Volt Transformers

This modification installed the new 4160-480 Volt transformers and associated support systems, such as; the outside 480 Volt bus ducts, supports, fire deluge system and other protective functions.

The changeout of the 4160-480 Volt transformers to higher capacity transformers and the relocation of these units did not change the operation of the 480 Volt essential system. The removal of the transformers from the 3-Room Control Complex significantly reduced the heat load in the 480 Volt Switchgear Room.

The overall system reliability was increased due to the more reliable transformers and by decreasing the heat levels in the 3-Room Complex. Since the specific function of the transformers was not changed and the system reliability was increased, the possibility of a new accident or malfunction was not created. The margin of safety had been increased pertaining to the adequacy of a source of power to the 480 Volt essential buses. There is no specific margin of safety defined for the 4160-480 Volt transformers.

CN-1622

Systems 92/Essential Power Undervoltage Protective Relaying

This modification removed all Class 1E functions from the 4160 Volt undervoltage system and installed new protective undervoltage relays on the 480 Volt essential buses.

CN-1622 installed a total of twelve (12) undervoltage relays on each 480 Volt essential bus. These relays, depending on the length and severity of the degraded voltage condition, will initiate a corrective action ranging from isolation and automatic transfer of an affected bus to initiating a reactor scram. Modifications and additions to the 480 Volt protective relaying system include two-out-of-three coincidence logic on all relay logic.

As described in the FSAR, all incidents concerning a loss of offsite power (with or without a loss of the unit generator and one emergency generator) were examined by the NRC and PSCo. It was determined that an occurance of loss of offsite power will initiate identical results with the new relaying modifications as with the previous undervoltage system. The probability of consequences resulting from an accident or malfunction, described in the FSAR, have not been increased. As defined in the basis for a Technical Specification or in the FSAR, no margin of safety exists which describe the design for protective relaying for the auxiliary power system. The modification was found not to involve an unreviewed safety question.

CN-1629

System 92/Current Limiting Reactors

This CN physically installed the current limiting reactors on the power feed of each of the eight (8) 480 Volt Motor Control Centers (MCCs) powered by a 480 Volt essential bus.

This change was necessary due to the increased capacity of the new 480 Volt essential switchgear. The electrical connection was performed under CN-1294, as previously discussed.

The installation of the current limiting reactors did not create any new accidents or malfunctions that were not previously analyzed in the FSAR. As the upgrade of the 480 Volt essential buses and subsequent installation of the current limiting reactors increased the reliability of the 480 Volt essential power system, the modification did not reduce any margin of safety, nor involve an unreviewed safety question.

CN-1703

Systems 46/63

This modification installed a vent line from the PCRV cooling water system surge tanks to the gas waste system. The change notice also analyzed the change to a nitrogen gas blanket from a hydrogen gas blanket on these surge tanks.

The modification changed the gas blanket on the 46-system surge tanks from hydrogen to nitrogen. The modification also installed a vent line from these surge tanks to the gas waste system. The vent line would be used to vent off the surge tanks whenever there is a possibility of contamination within the PCRV cooling water system.

A chemical deoxygenator will remove oxygen from the cooling water system more effectively than did the hydrogen cover gas, thus reducing the probability of corrosion of the system. Periodic venting of the surge tanks to the gas waste system will not increase the probability of an accident or malfunction. Use of the chemical deoxygenator and the nitrogen cover gas are compatible with system 46 materials and operation. The design, function and installation of the vent line was adequate to ensure safe operation. A margin of safety was increased with the replacement with a less reactive cover gas (nitrogen).

2.0 PUBLIC SERVICE COMPANY TESTS (T-TESTS)

There were no T-Tests performed during this report period.

3.0 PUBLIC SERVICE COMPANY REQUESTS FOR TESTS (RT-TESTS)

There were no RT-Tests performed during this report period.

4.0 SYSTEM OPERATING PROCEDURES

There were no major System Operating Procedure changes, other than those required by the modifications listed, submitted during this report period.

5.0 TABLE OF ABBREVIATIONS

ACM	Alternate Cooling Method
ANSI	American National Standards Institute
ASCO	Automatic Switch Company
ASTM	American Society for Testing and Materials
C	Compressor
CFM	Cubic Feet/Minute
CN	Change Notice (Public Service Company)
CO_2	Carbon Dioxide
CRDM	Control Rod Drive Mechanism
CSF	Core Support Floor
E	Exchange (Heat)
F	Filter
FCN	Field Change Notice (Non-Public Service Company Initiated Change)
FE	Flow Element
FES	Final Environmental Statement
FIS	Flow Indicator/Switch
FSAR	Final Safety Analysis Report
GAC	General Atomic Company
HSV	Hand Solenoid Valve
HV	Hand Valve

HVAC	Heating, Ventilating, and Air Conditioning
K	Engine (Diesel or Gasoline)
L	Line
LCV	Level Control Valve
N_2	Nitrogen (Gas)
NRC	Nuclear Regulatory Commission
P	Pump
PCRV	Prestressed Concrete Reactor Vessel
PDIS	Pressure Differential Indicating Switch
PDT	Pressure Differential Transmitter
PDV	Pressure Differential Valve
PPS	Plant Protective System
PS	Pressure Switch
PSCo	Public Service Company of Colorado
PSI	Pounds/Square Inch
PV	Pressure Valve
R	Refueling Region (When Followed By a Number)
RERP	Radiological Emergency Response Plan
RIS	Radiation Indicator/Switch
RT	Request for Test (General Atomic Technologies)
S & L	Sargent and Lundy

SOP	System Operating Procedure
T	Tank, Special Test (Public Service Company)
TIG	Tungsten Inert Gas
TT	Temperature Transmitter
V	Valve

6.0 SYSTEM NUMBER IDENTIFICATION TABLE

2	Plant Site
11	Reactor Vessel and Internal Components
12	Control Rods and Drives
13	Fuel Handling Equipment
14	Fuel Storage
15	Fuel Shipping Equipment
16	Auxiliary Equipment
17	Reflector
18	Fuel
21	Primary Coolant System (Helium Circulators and Auxiliaries)
22	Secondary Cooling System (Steam Generators)
23	Helium Purification System
24	Helium Storage System
25	Liquid Nitrogen System
29	Gas Charging Facility
31	Feedwater and Condensate
32	Feedwater Heater Vents and Drains

33	Water Treatment
41	Circulating Water System
42	Service Water System
44	Domestic Water System
45	Fire Protection System
46	Reactor Plant Cooling Water System
47	Purification Cooling Water System
48	Alternate Cooling Method
51	Turbine Generator and Auxiliaries
52	Turbine Steam
53	Extraction Steam
54	Turbine Lube Oil Purification
55	Turbine Vents and Drains
61	Decontamination System
62	Radioactive Liquid Waste System
63	Radioactive Gas Waste System
70	Structures - General
72	Reactor Building (Vents and Drains)
73	Reactor Plant Ventilation System
75	Turbine Building (Vents and Drains, HVAC)
78	Security System
79	Technical Support Building

82	Instrument and Service Air
83	Communication System
84	Auxiliary Boiler and Heating System
90	Computer Systems
91	Hydraulic Power
92	Electrical Power
93	Controls and Instrumentation
98	Hydraulic Piping Snubbers
99	Miscellaneous