



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

PUBLIC SERVICE COMPANY OF COLORADO

DOCKET NO. 50-267

FORT ST. VRAIN NUCLEAR GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 73  
License No. DPR-34

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Public Service Company of Colorado (the licensee) dated July 14, 1988, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

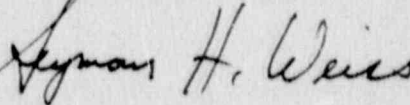
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. DPR-34 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 73, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Seymour H. Weiss, Director  
Non-Power Reactor, Decommissioning and  
Environmental Project Directorate  
Division of Reactor Projects - III,  
IV, V and Special Projects  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: November 15, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 73  
TO FACILITY OPERATING LICENSE NO. DPR-34  
DOCKET NO. 50-267

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
5.6-1	5.6-1
5.6-2	5.6-2
---	5.6-3
---	5.6-4
---	5.6-5
---	5.6-6
---	5.6-7

## 5.6 EMERGENCY POWER SYSTEMS - SURVEILLANCE REQUIREMENTS

### Applicability

Applies to the surveillance of the equipment supplying electrical power to the essential plant services.

### Objective

To establish the minimum frequency and type of surveillance for equipment supplying electric power to the plant auxiliaries to ensure that the motive power sources required to safely shut down the plant are available.

### Specification SR 5.6.1 - Standby Diesel Generator Surveillance

The surveillance of the standby diesel generators shall be as follows:

- | a) Each standby diesel generator set will be started and loaded to at least 50% of rated full load capacity once per week. The test shall continue for at least two hours to enable the standby diesel engine(s) and the generator to attain their normal operating temperatures.
- | b) A loss of outside source of power and turbine trip shall be simulated to demonstrate that the standby diesel generators and automatic controls are operable. This Surveillance Requirement shall be performed at least once per 6 months with a maximum allowable extension of 2 months per surveillance interval such that the maximum combined time interval for 3 consecutive surveillance intervals shall not exceed 20 months.
- | c) The standby diesel engine protection functions shall be calibrated annually.
- | d) The standby diesel engine exhaust temperature "shutdown" and "declutch" shall be functionally tested monthly and calibrated annually.

- e) A loss of outside source of power and turbine trip shall be simulated at least once per refueling cycle, not to exceed eighteen (18) months, to demonstrate that the standby diesel generators, automatic controls and load sequencers are operable. This surveillance may be performed in lieu of SR 5.6.1.b above.

Basis for Specification SR 5.6.1

The purpose of the weekly test of the standby diesel generator is to exercise the engine by operating at design temperature and to demonstrate operating capability. These tests will allow for detection of deterioration and failure of equipment.

The purpose of the loss of outside source of power and turbine trip test (SR 5.6.1.b), performed twice annually is to verify that the standby diesel generator(s) are capable of starting automatically upon a simulated loss of outside power and turbine trip. SR 5.6.1.e, performed at refueling intervals, verifies the same features as SR 5.6.1.b but, additionally, verifies that the load sequencers automatically pick up required loads in the event of a loss of voltage on the 480V essential buses.

Specification SR 5.6.2 - Station Battery Surveillance

Each required DC electrical power source shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
1. The Category A limits in Table 5.6.2-1 are met, and
  2. The total battery terminal voltage is greater than or equal to 2.15 volts per cell on float charge.
- b. At least once per 92 days, and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 145 volts, by verifying that:
1. The Category B limits in Table 5.6.2-1 are met,
  2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than or equal to 150 micro-ohms, and
  3. The average electrolyte temperature of at least 20% of the cells for Station Battery 1A and 1B is above 70 degrees F and for Station Battery 1C is above 60 degrees F.

- c. At least once per 18 months by verifying that:
1. The cells, cell plates, battery racks, and cell-to-cell and terminal connections show no visual indication of physical damage or abnormal deterioration,
  2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material, and
  3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150 micro-ohms.
  - 4.\* The required battery chargers will supply at least:
    - a) 325 (+0, -25) amperes for at least 4 hours for battery chargers 1A or 1B,
    - b) 200 (+0, -25) amperes for at least 4 hours for battery charger 1C,
    - c) 345 (+0, -25) amperes for at least 4 hours for battery charger 1D.
- d. At least once per 18 months during REACTOR SHUTDOWN, by verifying that the battery capacity is adequate to supply and maintain in an OPERABLE status all of the emergency loads for the design duty cycle when the battery is subjected to a Service Discharge Test.
- e. \*\*At least once per 60 months, during REACTOR SHUTDOWN, by:
1. A Performance Discharge Test of Batteries 1A and 1B, separately, (based on an average discharge rate of 340 amperes at an average electrolyte temperature of 77 degrees F) over a period of 4 hours, until the average battery terminal voltage reaches 1.75 volts/cell; the test shall be acceptable if, after 3.6 hours the battery is capable of producing at least 340 amperes, and the average battery terminal voltage is greater than 1.75 volts/cell.

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\* The battery chargers shall be surveilled during REACTOR SHUTDOWN in accordance with this provision at the first outage of one week duration or more following the effective date of this amendment or sooner.

\*\* A Performance Discharge Test will be performed in place of a Service Discharge Test during mid 1990 or sooner in accordance with IEEE guidance (i.e., within two years of installing a new battery).

2. A Performance Discharge Test on battery 1C (based on an average discharge rate of 183 amperes at an average electrolyte temperature of 77 degrees F) over a period of 4 hours, until the average battery terminal voltage reaches 1.71 volts/cell; the test shall be acceptable if, after 3.2 hours the battery is capable of producing at least 183 amperes and the average battery terminal voltage is greater than 1.81 volts/cell.

Once per 60-month interval, the Performance Discharge Test may be performed in lieu of the battery Service Discharge Test in Surveillance Requirement 5.6.2.d.

- f. At least once per 18 months, during REACTOR SHUTDOWN, by a Performance Discharge Test of battery capacity on any battery that shows signs of abnormal degradation or has reached 85% of the service life expected for the application. Abnormal degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 95% of the manufacturer's rating for Station Batteries 1A and 1B and below 90% for Station Battery 1C.

TABLE 5.6.2-1  
BATTERY SURVEILLANCE REQUIREMENTS

Parameter	(1) CATEGORY A		(2) CATEGORY B	
	Pilot Cell		Connected Cell(s)	
	Limits	Limits	(3) Allowable value	
Electrolyte Level	Greater than minimum level indication mark, and less than one quarter inch above maximum level indication mark.	Greater than minimum level indication mark, and less than one quarter inch above maximum level indication mark.	Above top of plates, and not overflowing.	
Float Voltage	$\geq 2.13$ volts	$\geq 2.13$ volts (4)	$\geq 2.07$ volts	
Specific Gravity (5)	$\geq 1.210$	$\geq 1.195$ for each connected cell.	Each connected cell not more than .020 below the average of all connected cells.	
		Average of all connected cells $> 1.205$ .	Average of all connected cells $> 1.195$ .	

'( )' refer to notes on following page.



| Notes for Table 5.6.2-1:

- | (1) For any Category A parameter(s) outside the limit(s) shown, the  
| battery may be considered OPERABLE provided that within 24 hours  
| all the Category B measurements are taken and found to be within  
| their allowable values, and provided the Category A and B  
| parameter(s) are restored to within limits within the next  
| 6 days.
- | (2) For any Category B parameter(s) outside the limit(s) shown, the  
| battery may be considered OPERABLE provided that the Category B  
| parameters are within their allowable values and provided the  
| Category B parameter(s) are restored to within limits within  
| 7 days.
- | (3) If any Category B parameter is not within its allowable value,  
| declare the battery inoperable.
- | (4) Measured cell voltages of cells warmer than average may be  
| corrected for electrolyte temperature, if measured cell voltage  
| is less than the acceptance criteria.
- | (5) Corrected for electrolyte temperature and level.

Basis for Specification SR 5.6.2

The surveillance requirement for demonstrating the operability of at least two of the 1A, 1B and 1C batteries is based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1987, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values, and the performance of battery service discharge and performance discharge tests ensures the effectiveness of the charging system, the ability of the battery to handle high discharge rates, and the adequacy of the battery capacity with respect to the rated capacity and emergency load requirements.

Table 5.6.2-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage, and specific gravity. The limits for the designated pilot cell float voltage and specific gravity, greater than or equal to 2.13 volts and specific gravity of 1.210 are characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than or equal to 2.13 volts and not more than 0.020 below the full charge specific gravity of 1.215 with an average specific gravity of all the connected cells not more than 0.010 below the full charge specific gravity of 1.215, ensures the operability and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 5.6.2-1 is permitted for up to 7 days as described in the notes for Table 5.6.2-1. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the recommended full charge specific gravity, ensures that the decreases in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, not more than 0.020 below average of all connected cells, ensures that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

The Performance Discharge Test is to be performed based on the recommendations of IEEE Standard 450-1987. The 340 ampere discharge rate for Batteries 1A and 1B and the 183 ampere discharge rate for Battery 1C are the recommended 4 hour rates.