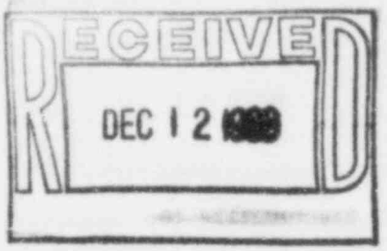
Public Service Company of Colorado
2420 W. 26th Avenue, Suite 100D Denver, Colorado 80211

50-267

November 30, 1983
Fort St. Vrain
Unit No. 1
P-83385



Mr. E. H. Johnson, Chief
Reactor Project Branch 1
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

SUBJECT: Neutron Detector Decalibration:
Request for Additional Information

REFERENCES: 1) Memo Fuller to Gammill, dated January 11, 1979
2) Memo Brey to Collins, dated May 16, 1983
3) Memo Johnson to Lee, dated November 1, 1983 (G-83399)

Dear Mr. Johnson:

The referenced number 3 memo requested additional information related to your review of the neutron detector decalibration. Your questions and the associated PSC responses follow:

Question 1

The loss of power to the floating trip point circuitry (FTC) was not included in the failure mode and effects analysis of Reference 1. What is the effect on the channel and trip systems for loss of power to the FTC? Also, identify the source(s) of instrument or control power to the FTCs.

PSC Response

The failure modes and effects analysis of Reference 1 (Section 3.3, page 50) covers only the "added" floating trip set point circuitry. Because the channel/detector power supply was not changed, it was not included in the analysis. As stated on page 56

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of Reference 1, the added circuitry "does not make a change in any failure modes of the original system, i.e., on loss of bus voltage or sensor, or on parts failure."

The circuits are designed to produce "scram" signals on loss of power and automatic tripping of the output upon removal of a circuit board. In addition, the 120% and 140% bistable trip circuit board is interlocked through the high voltage trip bistable to provide a trip output on loss of the detector high voltage power supply.

The power sources for the Three Dual Linear Power Range Channels are three Uninterruptible Instrument Power Supplies which feed the three channels (A, B and C) of the Plant Protection System.

Question 2

Reference 1 states that testing capabilities are provided to demonstrate operability of the FTC. With the addition of the FTC, the original function (trip action) of the plant protection system is maintained. Therefore, are the surveillance requirements of the FTC independent of those for the channel? If so, specify the surveillance frequencies for the FTC and appropriate Technical Specifications.

PSC Response

The surveillance requirements of the added circuits are the same as those of the existing Dual Linear Power Range Channel circuits. The frequencies for checks, calibrations and tests of the scram system are given in Table 5.4-1 of the FSV Technical Specifications. Also, the changes made do not alter the built-in calibration and trip test provisions; however, the details of the test procedures will be changed to accommodate the new circuitry.

Question 3

Verify by statement that the design modification and installation meet the acceptance criteria outlined in all applicable General Design Criteria, IEEE Standards and Regulatory guides for the reactor trip system. Specifically, the requirements of redundancy, single failure, channel independence, testability, equipment qualification, capability and reliability to shut down the reactor, etc. In part the acceptance criteria are as follows:

GDC	2, 13, 20-29
IEEE	279 - 1971
IEEE	379 - 1977
IEEE	384 - 1977

PSC Response

The FSV reactor trip system design was based on the 1967 edition of the NRC General Design Criteria. The FSAR states (pages 7.1-1 and -2) that the applicable criteria are 1-3, 6, 7, 12, 14, 15, 19-27, 31, 39 and 40. The FTC design meets these criteria and meets the intent of the criteria listed in the question.

The proposed changes for the FTC installation involve the replacement of entire Dual Linear Power Range Channel drawers/modules and does not alter anything external to the drawer/module such as the redundancy, overall logic, failure modes, field wiring, arrangement, independence, testability, reliability or physical separation of the reactor trip circuits for which FSV was granted a license. The design changes satisfy the requirements of IEEE 279 - 1968, the standard to which the original trip system was built. (The IEEE 279 version issued in 1971 is not significantly different from the 1968 version in the areas listed above.) Also, IEEE 379 and 384 represent expansions of the requirements in IEEE 279, and were not available when the trip system of FSV was designed and licensed. Therefore, these two standards are not applicable. However, the FSV FSAR contains a description of the methods accepted by NRC which were used to meet the IEEE 279 requirements for single failure and separation.

If you have any questions on this response please contact me on (303) 571-8404.

Very truly yours,

Lawrence Brey

H. L. Brey, Manager
Nuclear Engineering Division

HLB/JRR:pa