SNUPPS

Standardized Nuclear Unit
Power Plant System

5 Choke Cherry Road
Rockville, Maryland 20850
(301) 869-8010

Nicholas A. Petrick
Executive Director

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SUBJ: Instrumentation and Control Systems Branch Questions on the SNUPPS Technical Specifications

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket Nos. STN 50-482 and STN 50-483

Ref: USNRC (B.J. Youngblood) letter to UE (D.F. Schnell) and KGE (G. L. Koester), dated 4/17/84, Request for Additional Information

Dear Mr. Denton:

The referenced letter forwarded Instrumentation and Control Systems Branch questions on the SNUPPS Technical Specifications. Enclosed are SNUPPS responses to these questions.

Very truly yours,

Nicholas A. Petrick

JHR/dck/2a21

Attachment

cc: J. Neisler/B. Little, USNRC/CAL
W. Schum/A. Smith, USNRC/WC
J. Konklin, USNRC Region III
G. L. Koester, KGE
D. T. McPhee, KCPL
D. F. Schnell, UE

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ATTACHMENT 1

RESPONSES TO ICSB QUESTIONS

Question:

1. The applicant should clarify the differences between the overtemperature and overpower delta T equations in the FSAR Section 7.2.1.1.2 and the Technical Specifications Table 2.2-1.

Response:

a. Overtemperature delta T Setpoint.

Note 1 to Table 2.2-1 of the Technical Specifications is a detailed expression for the protection feature that includes:

1) The entire expression for the protection feature, i.e. measured delta T (Acted on by dynamic compensation) equated to the overtemperature delta T setpoint.

2) The Tavg dynamic compensation term - this term is the same as the one in the FSAR except the time constants have been numbered consecutively to identify their values.

3) The Lag compensator term $\left(\frac{1}{1+T_6 s}\right)$ (not included in the FSAR equations) is nothing more than a filter acting on the measured T_{AVG}.

b. Overpower delta T Setpoint

Note 3 to Table 2.2-1 of the Technical Specifications is a detailed expression for the protection feature that includes:

1) The entire expression for measured delta T (with dynamics) equated to the overpower delta T setpoint calculations.

2) The rate-lag dynamic compensation term is the same as shown in the FSAR except it is more specific as to the time constant number.

3) The filters acting on T_{avg} (measured)

The Tech Spec equation contains all components in the overtemperature ΔT and overpower ΔT circuitry which are important in the protection circuitry and which are modeled in the analysis. Section 7.2.1.1.2 of the FSAR provides a discussion of the functioning of the overtemperature and overpower ΔT circuit and does not need to include a discussion of the filters which are incorporated for signal conditioning purposes.

Question:

2a. The applicant should provide information to justify the omission of environmental errors for setpoint calculations related to each such case that exists or to include environmental errors for the affected backup trips.

Response:

The Westinghouse setpoint methodology has been submitted to the NRC for several plants in the past (V.C. Summer, D.C. Cook, and others) and has been accepted without any question of environmental allowances having been raised. There is nothing unique about the SNUPPS design that would require the additional uncertainties and therefore SNUPPS views this issue as a new generic requirement that could have a significant effect on trip setpoints. This requirement should be reviewed as a generic issue by the NRC before implementation.

Question:

2b. The applicant should provide information to verify that the safety analysis limits used in the setpoint calculations are consistent with those presented in the FSAR and that the FSAR safety analysis limits are correct.

Response:

There are two values in FSAR Table 15.0.4 which disagree with the safety analysis values noted in the setpoint study.

1) The FSAR safety analysis value provided for reactor trip on high pressurizer pressure is 2410 psig. This value was used to perform the FSAR analysis. When it became known that error associated with the Barton transmitters had to be increased, an evaluation was performed by Westinghouse to determine the impact of increasing the analysis value. It was found that pressurizer pressure could be as high as 2445 psig without impacting the analysis. The additional error introduced by the long term drift of the Barton transmitters, which is in excess of the Westinghouse purchase specification requirements, is completely enveloped by the 35 pound increase in the safety analyses value. Based on this evaluation 2445 psig was used in determining the reactor trip setpoint.

The only transient for which high pressurizer pressure is assumed to be available is the Loss of Load event. Westinghouse has performed an evaluation for the acceptability of a higher analytical setpoint to address an identified long term drift concern with Barton transmitters. The results of the evaluation concluded that the design basis for this transient would still be met with insignificant affect on peak pressure and DNBR.

This can be demonstrated for SNUPPS as illustrated in Figures 15.2-1 through 15.2-8 of the FSAR. Of the four cases analyzed, the first two cases (Fig. 15.2-1 through 15.2-4) tripped on OT Delta T and Low-Low steam generator level. The third and fourth cases tripped on high pressurizer pressure. The time to reach a 2460 psia setpoint versus 2425 psia is less than one second. The DNBR for these cases never drop below the initial steady state value. If the high pressure trip were not available, the OT Delta T trip has been shown in various studies to be sufficient to meet the basis for this event. Therefore, Westinghouse has determined that the analytical setpoint for 2445 psig is acceptable.

Since the above is an interim solution to the problem of Barton transmitter drift, SNUPPS does not feel that an FSAR change is appropriate.

2) The reactor trip safety analysis value for steam generator low-low level is incorrectly reported in the FSAR as 7.2%. The analysis was performed assuming a setpoint of 0% level. The FSAR will be revised.

Question:

5. The applicant should provide information clarifying why no Technical Specification on a Chlorine detection system has been input for Callaway.

Response:

The chlorine detection system specification was deleted from the Callaway Plant Technical Specifications based on discussions between Union Electric and the NRC (F. Anderson & Dr. G. Edison) on November 15, 1983. An error in Section 2.2.3 of the Callaway SER was pointed out at this meeting in that there is no chlorine gas stored on-site. The Callaway FSAR also indicates that there is no hazard from a credible chlorine transportation accident. It was therefore agreed that the specification was not necessary.

SNUPPS understands that the NRC is in the process of correcting the SER.

Question:

6a. Section 3/4.3.3 of the SNUPPS Technical Specifications should be modified to include the recommendations on remote shutdown systems contained in a December 30, 1982 memorandum from R. Mattson to D. Eisenhut.

Response:

The SNUPPS Utilities have incorporated the requirements of NUREG 0452 Rev. 4 for the remote shutdown monitoring instrumentation. The recommendation for imposition of Technical Specification limiting conditions for operation and surveillance requirements for the transfer switches, power, and control circuits appears to be unwarranted. These requirements have not been imposed on any other plant and appear to be generic in nature and should be treated as generic Standard Technical Specification requirements.

Question:

6b. Sections 3/4.3.3 and 6.8.4 of the SNUPPS Technical Specifications should be modified to include the recommendations on post-accident monitoring instrumentation contained in an October 12, 1983 memorandum from R. Mattson to D. Eisenhut.

Response:

The SNUPPS Utilities have incorporated in their Technical Specifications post accident monitoring instrumentation that meets or exceeds the proposed technical specification requirements of Reg. Guide 1.97 with the exception of Reactor Coolant Radiation Level monitor and the Containment Isolation Valve position indication. On July 6, 1982, SNUPPS submitted to the NRC a design comparison to Reg. Guide 1.97 revision 2 which is still being reviewed.

Question:

7a. The applicant should provide appropriate limiting conditions for operation and surveillance requirements related to the interlocks associated with the accumulator isolation valves and RHR inlet isolation valves.

Response:

The accumulator isolation valves were initially required to be opened with their power removed when above the P-11 setpoint because of a concern for spurious valve movement during accident situations. During meetings with the NRC Staff in November 1983 (Standardization and Special Projects Branch [SSPB]) and in January 1984 (SSPB and Reactor Systems Branch), a modification to the Technical Specification for the Accumulator Isolation Valves was made to replace the testing of the interlock with a surveillance requirement to verify the valve was open with power removed when above 1000 psig on a 31 days frequency basis. Therefore the interlock is not relied upon to operate and the Channel Calibration is not appropriate.

With regard to the RHR inlet isolation valves, Reactor Coolant System Pressure Channels 403 and 405 which are used to control operation of these valves are surveilled and calibrated by a Channel Calibration on an 18 month frequency by Specification 4.3.3.6. In addition, the interlock itself is tested pursuant to specification 4.5.2.d.1)a). No other surveillances are required.

Question:

7b. The applicant should revise the wording of surveillance 4.5.2.e.1 to clarify its intent.

Response:

SNUPPS accepts the revised wording of this surveillance item as provided by the NRC (F. Anderson) on 3/30/84. A copy of the revised page from the Technical Specifications is attached.

SURVEILLANCE REQUIREMENTS (Continued)

2) A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.

e. At least once per 18 months, during shutdown, by:

1) Verifying that each automatic valve in the flow path actuates to its correct position on a Safety Injection test signal and/or on Automatic Switchover to Containment Sump from RWST Level-Low-Low coincident with Safety Injection test signal; and

2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection actuation test signal:

a) Centrifugal charging pump,

b) Safety Injection pump, and

c) RHR pump.

f. By verifying that each of the following pumps develops the required differential pressure on recirculation flow when tested pursuant to Specification 4.0.5:

1) Centrifugal charging pump $\geq$ 2400 psid,

2) Safety Injection pump $\geq$ 1445 psid, and

3) RHR pump $\geq$ 165 psid.

g. By verifying the correct position of each mechanical position stop for the following ECCS throttle valves:

1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and

2) At least once per 18 months.

HPSI System Valve Numbers		CVCS System Valve Numbers
EMV095	EMV109	BGV-198
EMV096	EMV110	BGV-199
EMV097	EMV089	BGV-200
EMV098	EMV090	BGV-201
EMV107	EMV091	BGV-202
EMV108	EMV092	

Question:

9. The applicant (Callaway only) should revise the specifications to include appropriate periodic surveillance requirements and limiting conditions for operation for temperature initiated actuation of the ultimate heat sink cooling tower fans.

Response:

A joint evaluation by SNUPPS, Westinghouse and Bechtel has determined that a period of time greater than 6 hours would be required to raise the UHS temperature from the auto start setpoint of 85°F to the Design Basis of 95°F. Therefore, a Technical Specification on the auto start feature is not required as sufficient time would be allowed for the operator to respond and manually start the fans.

Question:

10. The applicant should provide Technical Specification requirements to ensure the reliability of charging pump suction switchover to the RWST on volume control tank low-low level.

Response:

Westinghouse discussed the control/protection interaction of this function with the NRC in 1981 and it was then determined not to be a safety issue because there is sufficient time available for the operator to respond to the transient. No action was taken at that time, or any time since, to add this requirement to the Technical Specifications. To add this requirement to the SNUPPS Technical Specifications now would be a generic change and a reversal of a previous NRC decision.

Question:

11. The applicant should provide appropriate limiting conditions for operation and surveillance requirements for the instrumentation used to initiate the safety functions identified in SER Section 7.3.2.9, or provide reference to the existing requirements if they already exist in the Technical Specifications.

Response:

It is SNUPPS understanding, after discussions with the NRC on December 13, 1983, that SNUPPS has correctly identified all BOP ESFAS features that are safety-related in the FSAR Section 7.3 Other instrumentation and controls are implicitly included in the Technical Specifications by the definition of OPERABILITY:

"OPERABLE - OPERABILITY

1.18 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s)."