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SUBJECT: Application proposing Amends 95 & 48 to Licenses NPF-14 & NPF-22 respectivly, changing Tech Spec 4.1.3.1.4(a) re surveillance of scram discharge volume vent & drain valves. Fee paid.

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APR 16 1987

Director of Nuclear Reactor Regulation
Attn.: Dr. W. R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENTS NO. 95 TO LICENSE NPF-14
AND NO. 48 TO LICENSE NPF-22
PLA-2840 FILES A17-2, R41-2

Docket Nos. 50-387
and 50-388

Dear Dr. Butler:

The purpose of this letter is to request changes to the Susquehanna SES Units 1 and 2 scram discharge volume system Technical Specification 4.1.3.1.4(a). The proposed changes are described as follows and are attached to this letter in marked-up form.

Technical Specification 4.1.3.1.4(a)

Technical Specification 4.1.3.1.4(a) currently requires the scram discharge volume (SDV) vent and drain valves to be demonstrated operable when control rods are scram tested from a normal control rod configuration of less than or equal to 50% rod density. The requirement to perform this surveillance from a scram from less than or equal to 50% control rod density is deleted to allow performance during a scram from shutdown conditions. The revised Specification 4.1.3.1.4(a) will be:

The scram discharge volume shall be determined OPERABLE by demonstrating:

a. The scram discharge volume drain and vent valves OPERABLE at least once per 18 months, by verifying that the drain and vent valves:

   1. Close within 30 seconds after receipt of a signal for control rods to scram, and

   2. Open when the scram signal is reset.

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The footnote on 4.1.3.1.4(a) which exempted the surveillance from Specification 4.0.4 (to allow entry into Operational Condition 2 provided the surveillance is performed within 12 hours after achieving less than or equal to 50% ROD DENSITY) will no longer be needed and is therefore deleted.

JUSTIFICATION

This Technical Specification change is justified on the basis that: (1) deletion of the 50% rod density requirement in Specification 4.1.3.1.4(a) will eliminate the possibility of subjecting Susquehanna SES Units 1 and 2 to additional plant scrams for the purpose of meeting this requirement, and (2) operability of the SDV vent and drain valves can be adequately demonstrated during a scram initiated from shutdown conditions in either Operational Condition 4 or 5, as occurs during the 18 month reactor mode switch shutdown position functional check, as is shown in the Safety Impact Assessment (below).

PROBLEM BACKGROUND

Current practice at Susquehanna SES is to perform the Specification 4.1.3.1.4(a) surveillance in conjunction with a planned unit shutdown, such as the controlled shutdown at the end of cycle or the post-refueling scrams taken for individual control rod scram timing. Because of this practice, Susquehanna SES does not usually need to execute a reactor scram for the specific purpose of meeting the 50% control rod density requirement. However, to date, one plant scram has been taken explicitly to meet this criterion. On October 18, 1984, SSES Unit 1 was shut down to perform the 18 month SDV vent and drain valves operability check, which was overdue. One vent valve failed to close within 30 seconds, and was replaced. On October 21, 1984, Unit 1 was brought up in power to less than or equal to 50% control rod density, and was scrammed in order to clear the Limiting Condition for Operation for the failed surveillance. The first scram resulted from the discovery of the missed surveillance; the subsequent startup and scram were specifically to meet the 50% rod density requirement. The 50% rod density requirement in this specification has the potential to cause Susquehanna SES to take additional plant scrams in the future, in the event of another failure to meet the surveillance acceptance criteria. Deletion of this unnecessary requirement will be an increase in safety, since every scram is a potential challenge to safety related systems.

Another difficulty arising from performance of the surveillance from 50% rod density is that is is a distraction and an inconvenience to reactor operators during unit shutdown. This surveillance can be a strain on critical personnel during unit shutdown, when operators are typically very busy with normal shutdown activities, since even a controlled shutdown is a serious plant transient.

An historical example of how this surveillance can be a burden on critical resources occurred at Unit 2 on October 12, 1984. Operations opted to not perform this surveillance during a controlled unit shutdown due to the overriding concern of Feedwater Level Controller problems, which required

constant attention in order to avoid a reactor water level excursion. This surveillance was later successfully performed during a subsequent planned shutdown on March 21, 1985, and was within the required 18 month frequency.

If PP&L is ever unable to perform this surveillance during a planned unit shutdown, the potential exists that we may have to undergo a later scram for the sole purpose of performing this surveillance within the required 18 month frequency.

Deletion of the 50% control rod density criterion as requested by this letter will allow Susquehanna SES to perform the test during Operational Condition 4 or 5 in conjunction with a scram initiated from shutdown conditions, as occurs in the 18 month reactor mode switch shutdown position functional check (Technical Specification Table 4.3.1.1-1, Item 11). This would eliminate the possibility of taking additional reactor scrams for the specific purpose of meeting the 50% control rod density criterion.

SAFETY IMPACT ASSESSMENT

The original intent of the 4.1.3.1.4(a) surveillance was to demonstrate the operability of the entire scram discharge system as an integrated whole by demonstrating scram instrument response and valve function at pressure and temperature at approximately 50% control rod density. The justification for this proposed Technical Specification change is that operability can be satisfactorily demonstrated during a scram initiated from either cold shutdown or refueling mode conditions, as in the 18 month reactor mode switch shutdown position functional check. This surveillance verifies that the SDV vent and drain valves:

(1) close within 30 seconds after receipt of a signal for control rods to scram, and
(2) open when the scram signal is reset,

thereby ensuring that the safety functions of the valves are reliable. These functions are briefly described as follows.

The primary safety function of the vent and drain valves is to prevent an uncontrolled release of reactor coolant following a scram. This function is ensured by the requirement that the valves close within 30 seconds following a scram signal. A passive safety function of the valves is to open when the scram signal is reset and to remain open during normal operation to prevent CRD leakage from accumulating in the SDV. (Redundant level instrumentation ensures that, in the event of flow blockage or valve failure, water will never accumulate to an amount which will inhibit a reactor scram.)

Performance of the 4.1.3.1.4(a) surveillance during shutdown conditions will still ensure that these safety functions will be met, even though the test conditions of nearly ambient pressure and temperature, and reduced CRD discharge flow due to the rods being fully inserted prior to the scram signal do not match operating conditions. The maximum SDV pressure during shutdown conditions will be equal to the static pressure head of RPV water, as opposed

to rated RPV pressure during the test at 50% rod density. During this surveillance, however, pressure does not influence the vent and drain valve closure rates, since the SDV is of sufficient volume and initially vented such that peak pressure prior to SDV isolation will not be substantial. After the valves are closed, the SDV will fill due to post-scram CRD leakage, and SDV pressure will be on the order of reactor pressure. Since backpressure during scram will not be significant from either 50% rod density or shutdown conditions, the condition of initial reactor pressure will not affect the ability to meet the 30 second closure criterion. Specification 4.1.3.1.4(a) also requires the valves to open when the scram signal is reset. Backpressure will become significant following a test from 50% rod density, but will not be appreciable from the proposed Condition 4 or 5 test. It must be noted, however, that the ability of the valves to open against rated pressure is demonstrated after each reactor scram that occurs during the 18 month interval between surveillance tests. There are group valve position indication lights in the control room, and the post-scram surveillance of float switches verifies that the SDV has drained. Thus, an initial condition of rated reactor pressure is not essential to ensure the validity of the surveillance.

The initial test condition of reactor coolant temperature will not be significant to the outcome of the surveillance. The cooler reactor coolant temperature during shutdown conditions will have negligible effect (if any) on the valve stroke times measured in the surveillance. Specification 4.1.3.1.4(a) requires verification that the SDV rent and drain valves close within 30 seconds after receipt of a scram signal. Since this requirement permits a long valve stroke time, any slight variation in closure time due to temperature differences will be relatively insignificant.

The quantity of CRD discharge flow will not affect the ability to meet the 30 second valve closure requirement, since the SDV will not become pressurized until some time after the valves have closed. The CRD discharge flow rate is an indicator of possible obstructions in the CRD discharge lines and SDV vent and drain lines. Determination of possible obstructions is not within the scope of Specification 4.1.3.1.4(a), however, nor are any flow rates measured. It is noteworthy that obstructions in the 3/4 inch piping between each CRD and the SDV headers would be made evident during periodic control rod scram time testing. Also, lack of obstructions in the drain line is continuously indicated during normal operation by redundant SDV level sensing instrumentation.

Since the initial conditions of pressure, temperature, and CRD discharge flowrate will have no appreciable effect on vent and drain valve performance, performance of the 4.1.3.1.4(a) surveillance during shutdown conditions will not affect the validity of the surveillance results. Thus, this proposed Technical Specification change will still ensure the safety functions of the SDV vent and drain valves, and therefore, is not a reduction in safety. Moreover, since every reactor scram is a serious plant transient and a potential challenge to safety related systems, the potential decrease in future scrams resulting from this Technical Specification change will represent an increase in safety.

NO SIGNIFICANT HAZARDS CONSIDERATION

I. The proposed Technical Specification change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Current practice at Susquehanna SES is to perform the Specification 4.1.3.1.4(a) SDV vent and drain valve surveillance from a scram at less than or equal to 50% rod density in conjunction with unrelated plant shutdowns. Deletion of the 50% rod density requirement will have no effect on plant operation other than to possibly eliminate unnecessary future scrams, should PP&L be unable to perform this surveillance during a planned shutdown, due to testing or scheduling difficulties.

Also, performance of the vent and drain valve surveillance as proposed will still meet the intent of Specification 4.1.3.1.4(a), and thereby will not cause an increase in the probability or consequences of an ATWS or any other previously evaluated accident.

II. The proposed Technical Specification change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed Specification 4.1.3.1.4(a) will allow performance of the SDV vent and drain valve surveillance during a scram initiated from shutdown conditions, as occurs during the existing 18 month reactor mode switch shutdown position functional check (Technical Specification Table 4.3.1.1-1, Item 11). The physical test configuration for this proposed surveillance will be no different from the configuration for the mode switch test. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

III. The proposed Technical Specification change does not involve a significant reduction in a margin of safety.

As demonstrated in the above Safety Impact Assessment, the initial test conditions of pressure, temperature, and CRD discharge flowrate will have no appreciable effect on vent and drain valve performance. Therefore, performance of the 4.1.3.1.4(a) surveillance from shutdown conditions will not affect the validity of the surveillance results. Thus, this proposed Technical Specification change will still ensure the safety functions of the SDV vent and drain valves, and therefore, is not a reduction in safety. Moreover, since every reactor scram is a serious plant transient and a potential challenge to safety related systems, the potential decrease in future scrams resulting from this Technical Specification change will represent an improvement in overall safety.

Surveillance from the proposed initial conditions will still meet the intent of Specification 4.1.3.1.4(a), thereby ensuring that the margin of safety provided by the scram discharge system is maintained.

IMPLEMENTATION

We anticipate that the Specification 4.1.3.1.4(a) surveillance will be next performed during the Susquehanna SES Unit 1 end of cycle shutdown, leading into the third refueling and inspection outage. Since this outage is tentatively scheduled to begin September 5, 1987, we request approval of these Technical Specification changes, to become effective upon issuance, for both units prior to September 1, 1987. This will allow performance of the surveillance as proposed during the outage.

Requests for additional information may be directed to Mr. L. M. Olson (215/770-7906). Pursuant to 10CFR170.21, the appropriate fee is enclosed.

Very truly yours,

Bruce D. Kenyon
Senior Vice President - Nuclear

Enclosure

cc: NRC Document Control Desk (original)
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