UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 134 TO FACILITY OPERATING LICENSE NO. NPF-21

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 2

DOCKET NO. 50-397

1.0 INTRODUCTION

By letter dated October 31, 1994, the Washington Public Power Supply System (WPPSS, or the licensee) submitted a request for changes to the Technical Specifications (TS) for Nuclear Project No. 2. The proposed changes modify the TS to: (1) add two action statements that would provide allowed outage times (AOTs) for either one or both of the scram discharge volume (SDV) vent or drain valves less stringent than the current requirements of TS 3.0.3., and (2) change the surveillance requirements for the SDV vent and drain valves to conduct the testing during shutdown conditions rather than at power as currently required.

2.0 BACKGROUND

The purpose of the scram discharge volume (SDV) is to serve as a collection volume for reactor coolant displaced by the control rod drive (CRD) pistons during a scram. The SDV is described in Section 4.6.1.1.2.4 of the WNP-2 Final Safety Analysis Report (FSAR). During normal operation, the SDV vent and drain valves remain open to allow operational leakage from the CRDs to drain from the SDV to the reactor building equipment drain sump. This ensures that a sufficient air volume is available in the SDV at all times to allow a complete scram. The SDV vent lines are open to the reactor building atmosphere to assure proper drainage of the SDV.

The SDV consists of header piping that connects to the scram outlet valves of each control rod hydraulic control unit (HCU) and drains into an instrument volume. There are two headers and two instrument volumes, each receiving approximately one-half of the 185 CRD piston discharges. The two instrument volumes are connected to a common drain line, which has two redundant air operated isolation valves in series. Similarly, the two headers are connected to a common vent line having two redundant air operated isolation valves in series. The drain line is hard piped to the reactor building equipment drain sump, and the vent line is hard piped to a reactor building floor drain sump, with the discharge pipe below the water level. Except for two test pushbuttons, which are used for valves stroke timing, there are no controls in the control room for operating these valves. The valves are located in the reactor building and may be operated locally. They close automatically upon

receipt of a scram signal to isolate the SDV to prevent leakage of reactor coolant past the CRD seals from entering the reactor building equipment drain sump following a scram. The valves also close automatically upon loss of air to the valves or electrical power to the associated solenoid pilot valves. Following a scram, the valves will reopen automatically when the scram signal is reset.

The two redundant automatic isolation valves in each SDV vent and drain line provide assurance that the SDV will be isolated during a scram, thereby limiting the amount of reactor coolant discharged to the reactor building drain sumps. The NRC staff review of the consequences of a structural failure of the SDV following a scram is discussed in NUREG-0803, "Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping." In the NUREG safety evaluation, the NRC staff concluded that, for a bounding leakage case corresponding to a rupture of the SDV, offsite doses would be well within the 10 CFR Part 100 reference values, and that adequate core cooling would be maintained. The failure to isolate one or more SDV vent or drain lines is bounded by the NUREG evaluation.

In order to permit control rods to insert completely during a scram, an adequate free volume must exist in the SDV to accommodate the water displaced by the CRD pistons as the control rods are inserted into the reactor. As a precautionary measure, the reactor will automatically scram if the water level in the SDV instrument volume exceeds the high level setpoint. This assures that the reactor will shut down while an adequate air volume remains in the SDV to support full insertion of the control rods. The SDV high level scram can be manually blocked only when the reactor mode switch is in the "Shutdown" or "Refuel" positions. This permits the control room operators to reset the scram signal, which automatically reopens the SDV vent and drain valves to drain the SDVs. Water level in the SDV is detected by both float-type level switches and differential pressure (dp)-type level trainsmitters. Separate level switches actuate a high level alarm in the control room and establish a control rod withdrawal block condition before reaching the SDV high level scram setpoint. This gives operators time to take corrective action before the scram occurs.

During normal operation, the only expected source of leakage into the SDV is from CRD seal leakage past the scram outlet valves. This leakage is typically maintained at very small values because excessive leakage past the scram outlet valves would cause the control rods to drift. A drifting control rod can initiate a rod block, as well as a scram, if the associated trip setpoints are exceeded. If the SDV drain lines were isolated, SDV level would increase due to normal scram outlet valve leakage. The leakage rate was estimated in Reference 4 to be approximately 40 gallons per hour. As discussed in WNP-2 TS Limiting Safety System Settings Bases 2.2.1.8, "Scram Discharge Volume Water Level - High," each SDV instrument volume provides 64.9 gallons of margin between the high level alarm and the high level automatic scram setpoints. Hence, the level increase allows approximately 1.6 hours to respond to the SDV high level alarm in the control room before actuation of the automatic scram. This is ample time to take action to reduce a SDV instrument volume level to prevent the scram.

Currently, WNP-2 TS do not provide a specific AOT for the CRD system SDV vent and drain valves to allow time for restoration should one of these valves become inoperable. If one or more of the valves are discovered to be inoperable, an immediate plant shutdown would be required in accordance with Limiting Condition for Operation (LCO) 3.0.3. This situation limits plant operational flexibility, and increases the risk of a plant scram and challenges to safety systems if the plant were required to shut down immediately for this condition.

3.0 EVALUATION

The licensee proposes to amend TS 3.1.3.1 to include the following AOTs for the SDV vent and drain valves:

d.# With one or more SDV vent or drain lines with one valve inoperable,

1. Isolate## the associated line within 7 days.

2. Otherwise, be in HOT SHUTDOWN within the next 12 hours.

e.# With one or more SDV vent or drain lines with both valves inoperable,

1. Isolate## the associated line within 8 hours.

2. Otherwise, be in HOT SHUTDOWN within the next 12 hours.

#Separate ACTION statement entry is allowed for each SDV vent and drain line.

##An isolated line may be unisolated under administrative control to allow draining and venting of the SDV.

Proposed TS Action Statement 3.1.3.1.d prescribes actions if one of the two redundant valves in an SDV vent or drain line becomes inoperable. With one or more SDV vent or drain valves inoperable, the isolation function would be maintained since the redundant valve in the affected line would perform its safety function of isolating the SDV. The proposed action statement would allow 7 days to repair the inoperable valve or to isolate the affected line. If the affected line is not isolated within the 7 day time period, the licensee would then be required to proceed to HOT SHUTDOWN in the next 12 hours. The staff considers the 7 day AOT acceptable because of the low probability of the concurrent events of a scram within the 7 days of the AOT and a failure of the redundant valves. Alternately, if the inoperable valve was initially closed, the staff expects that ample time and warning would be available to drain the SDV before the automatic scram due to SDV high level would occur.

The licensee has further proposed to treat each vent and drain line separately by permitting entry into separate Action Statements for each vent and drain line. This is consistent with the improved TS (ITS). The staff considers the licensee's proposal acceptable.

Proposed TS Action Statement 3.1.3.1.e would permit the licensee to take up to 8 hours to repair two inoperable valves on the same vent or drain line, or to manually isolate the affected line. If this requirement is not met, the licensee would then be required to be in HOT SHUTDOWN within the following 12 hours. The staff considers this proposed Action Statement acceptable because (1) the probability of a scram during the allowed outage time of two valves is acceptably low, and (2) in the event of a scram, the release of reactor coolant to the reactor building through the affected vent or drain line can be terminated by resetting the scram, which would close the scram outlet valves, or by manually closing the isolation valves located on each SDV vent and drain line. Also, as discussed above, in the event that a vent or drain line were isolated due to inoperable valves, the staff expects that ample time and warning would be available to drain the SDV before the automatic scram due to SDV high level would occur. The licensee also proposed to treat each entry into the Action Statement for each set of vent or drain lines separately, as described in the ITS. The staff considers this acceptable.

Following isolation of one or more SDV vent or drain lines, the licensee proposed to allow opening of the affected lines under administrative controls to permit draining and venting the SDV. This operation would allow any accumulated water in the line to be drained, to preclude a reactor scram on SDV high level. The staff has evaluated this change and finds it to be acceptable, since the remaining operable SDV vent and drain valves would close automatically on a scram signal to isolate the lines. If both valves in a line were inoperable, the reactor coolant release could be terminated by resetting the scram from the control room, or by locally manually closing the valves. Resetting the scram automatically closes the scram outlet valves, isolating the CRD discharge path to the SDV.

The licensee proposes to amend TS Surveillance Requirement 4.1.3.1.4.a to read as follows:

> 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 an actual or simulated scram signal, and
>
> 2. Open when the actual or simulated scram signal is reset.

This proposed change removes the requirement to perform the surveillance "when control rods are scram tested from a normal control rod configuration of less than or equal to 50% ROD DENSITY." This deletes the requirement to perform the surveillance with control rods withdrawn, and adds the option of verifying SDV vent and drain valve operability using an actual or simulated scram signal. This would allow the surveillance to be performed during shutdown conditions, which would eliminate approximately 20 scrams at power over the current 40-year life of the plant, and prevent the concomitant transients and challenges to plant safety systems. The licensee also proposed deleting the Note* at the bottom of page 3/4 1-5, which currently gives exception to TS 4.0.4. The proposed change removes the need to change modes to perform the surveillance; thus, Note* is no longer needed.

The operability of the SDV vent and drain valves can be satisfactorily demonstrated during an actual or simulated scram from shutdown conditions, even though the surveillance test conditions do not match test conditions when the surveillance was performed at power. At shutdown, reactor coolant temperatures and pressures are nearly ambient, and the control rod drive (CRD) discharge flow is reduced due to the rods being fully inserted. The maximum SDV pressure (back pressure) for a test at shutdown will be equal to the static pressure head of the reactor pressure vessel (RPV) water, as opposed to full reactor pressure for a test at 50% rod density. However, the back pressure and CRD discharge due to a scram from power conditions will not significantly affect the SDV vent and drain valves closure times, since the SDV is initially vented. The test pushbuttons provide simulated reactor protection system (RPS) scram logic signals to the SDV vent and drain valve solenoid pilot valves to initiate the valve closure response. Testing at WNP-2 demonstrated that there is less than a 1 second difference in valve closing time from a scram at less than or equal to 50% rod density versus the closure time using the test pushbuttons during either power or cold shutdown conditions. These test results show that the differences in temperatures, pressures, and CRD discharge flows between power and cold shutdown conditions have a negligible effect on SDV vent and drain valve closing times.

The proposed surveillance requirement will not demonstrate the ability of the SDV vent and drain valves to open against a back pressure equal to full reactor pressure. However, the valves are verified to be open following a scram reset as part of WNP-2 scram recovery procedures. Thus, the ability of the valves to open against full reactor pressure wil be demonstrated after each reactor scram from power. Any necessary repairs and post maintenance operability testing would be performed prior to startup.

Since the initial conditions of pressure, temperature, and CRD discharge flow rate will not have an appreciable effect on vent and drain valve performance, conducting the proposed TS surveillance requirement during shutdown conditions will not affect the validity of the surveillance results. Thus, the proposed TS change will still adequately ensure the safety functions of the SDV vent and drain valves and, therefore, is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Washington State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (59 FR 65828). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Clifford

Date: February 27, 1995

TAC NO. M90836

PROJECT DIRECTORATE IV-2
AMENDMENT ROUTE SLIP

SE BY:

1. Doris J. Foster-Curseen	, LA - concurrence DJ-C 2/1/95
2. JClifford	, Project Manager - concurrence C 2/2/95
3. ~~CGrimes~~ OTSB	
4. ~~RJones SRXB~~ ~~RWesswan, EMEB~~ M Reich for JT	, Tech Review Br. - concurrence
5. OGC	, concurrence
6. JClifford	, Project Manager - signature/call State C
7. ~~Theodore R. Quay~~	, Director, PDIV-2- concurrence/signature
8.	, Assistant Director - signature (as required)
9. Doris J. Foster-Curseen	, LA - Check Tech Specs, Assign Amend. No. and Date
10. PDIV-2 Secretary	, Dispatch 2/27/95
Plant(s): WNP-2	Amendment No(s). 134
Subject: Modification of AOT for either one or both of the scram discharge vol. vent or drain valves less stringent than current ones	
Appl. Date: 10/31/94	

SRP Section/Regulation/Policy Stmnt or Reg Guide: SLP 4.6 3.9.4

Initial Determination: Significant Hazards Consideration
(No Significant Hazards Consideration)
No Initial Determination Made

Ind/(Biweekly)
FRN Date: 12/21/94
Cite: 59 FR 65828

Notice Period 30 Days. Notice period expires January 20, 1995 (date)
If less than 30 days or hearing request received: Final No Significant Hazards Consideration Determination enclosed: Yes _____ Emergency or Exigency _____

Input for Biweekly/Individual FR Notice Enclosed: Yes X No ____

Date PM Consulted with State: 2/21/95 Comments: Yes ____ No X

Date LA checked with SECY (504-1677/78) for Petitions for Leave to Intervene: 2/21/95
Petitions Filed: Yes ____ No ✓

Date LA checked with ADM (415-7158) for public comments: 2/21/95
Comments Filed: Yes ____ No ✓

Remarks

9500691

FROM: Doris J. Foster-Curseen 504-415-1379 Mail Stop O-13E18

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