CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9908060113 DOC.DATE: 99/07/29 NOTARIZED: YES DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
SMITH,G.O. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
Records Management Branch (Document Control Desk)

SUBJECT: Application for amend to license NPF-21,revising TS 3.4.9, "RHR Shutdown Cooling Sys - Hot Shutdown."

DISTRIBUTION CODE: A001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 10+14
TITLE: OR Submittal: General Distribution

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	LPD4-2 LA	1	1	CUSHING,J	1	1
	SC	1	1			
INTERNAL:	ACRS	1	1	FILE CENTER 01	1	1
	NRR/DE/EEIB	1	1	NRR/DSSA/SPLB	1	1
	NRR/DSSA/SRXB	1	1	NUDOCS-ABSTRACT	1	1
	OGC/RP	1	0			
EXTERNAL:	NOAC	1	1	NRC PDR	1	1

CATEGORY 1 DOCUMENT

MICROFILMED

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTTR 12 ENCL 11

AA2

WASHINGTON PUBLIC POWER SUPPLY SYSTEM
P.O. Box 968 • Richland, Washington 99352-0968

July 29, 1999
GO2-99-145

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
REQUEST FOR AMENDMENT
TECHNICAL SPECIFICATION 3.4.9
RESIDUAL HEAT REMOVAL SHUTDOWN
COOLING SYSTEM - HOT SHUTDOWN

Reference: NRC Administrative Letter 98-10, dated December 29, 1998, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety."

In accordance with the Code of Federal Regulations, Title 10, Parts 2.101, 50.59 and 50.90, the Washington Public Power Supply System (Supply System) hereby submits a request for amendment to the WNP-2 Operating License. Specifically, the Supply System is requesting a revision to Technical Specification 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown." This amendment requests that the APPLICABILITY for this Technical Specification be changed from, "MODE 3 with reactor steam dome pressure less than the RHR cut-in permissive pressure," to "MODE 3 with reactor steam dome pressure less than 48 psig." This amendment also requests changes to the notes associated with Technical Specification SR 3.4.9.1 and SR 3.5.1.2. This change is needed because some parts of the RHR system are not analyzed to operate at the temperature associated with the RHR cut-in permissive pressure.

A001 1/1

060007

Technical Specification 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," establishes requirements for fuel cooling during hot shutdown conditions. Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products and increases the temperature of the reactor coolant. This decay heat must be removed to reduce the temperature of the reactor coolant to less than or equal to 200° F in preparation for performing refueling or cold shutdown maintenance operations, or the decay heat must be removed for maintaining the reactor in the hot shutdown condition.

The two redundant, manually controlled, shutdown cooling subsystems of the RHR system provide decay heat removal. Each loop consists of a motor driven pump, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after circulation through the respective heat exchanger, to the reactor via the associated recirculation loop. The RHR heat exchangers transfer heat to the Standby Service Water system.

The applicability statement for Technical Specification 3.4.9 states, "Mode 3 with reactor steam dome pressure less than the RHR cut-in permissive pressure." The cut-in permissive pressure has an allowable value of less than or equal to 135 psig. The instrument that provides the cut-in permissive causes an isolation of RHR Shutdown Cooling (SDC) mode. The isolation function is specified in Technical Specification Table 3.3.6.1-1, Function 5e, Primary Containment Isolation Instrumentation, Reactor Vessel Pressure - High. If the RHR system is in SDC and this pressure is exceeded, the logic will trip and close the RHR suction and supply valves and the reactor head spray valve (if open). Thus, the primary reason for the instrument is to prevent an intersystem loss of coolant accident (LOCA) by preventing the premature initiation of RHR during a shutdown when reactor pressure is greater than 135 psig and to provide isolation of the RHR system if reactor pressure exceeds 135 psig. This proposed revision does not change the protection against an intersystem LOCA provided by the pressure switches. As stated in the bases for Technical Specification 3.3.6.1, Function 5e, "This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario and credit for the interlock is not assumed in the accident or transient analysis in the FSAR." This change does propose to continue to use administrative controls to protect portions of the RHR system against unanalyzed thermal stress that could occur if RHR SDC is manually initiated at or above 48 psig under saturated conditions.

The SDC mode of the RHR system is not initiated at the RHR cut-in pressure of 135 psig because of original design temperature limitations associated with the system. The original design temperature limitation for the shutdown cooling mode of the RHR system was 335° F corresponding to a saturation pressure of 95 psig. A further restriction of 295° F (which corresponds to a saturation pressure of 48 psig) was in place downstream of the RHR heat exchangers where cooler temperatures were expected during shutdown cooling. The expected method of operation was one of throttling total flow through the RHR heat exchanger with the RHR return valves to control vessel cool-down. This resulted in lower temperatures associated with the piping and pipe supports downstream of the RHR heat exchangers.

A change in the method of operation of RHR in the shutdown cooling mode was made in 1989. This change was made to eliminate the degradation of the RHR return valves due to cavitation during shutdown cooling operation. Since that time the RHR system is operated in shutdown cooling by maintaining high flow through the pumps at all times. Vessel cool-down is controlled by throttling the amount of flow allowed through the heat exchanger and its bypass. Based on the most limiting section of the RHR shutdown cooling piping and supports (downstream of the heat exchanger), an operational limit of 295° F was imposed for shutdown cooling initiation. This temperature limit results in a RHR pressure limit for shutdown cooling of 48 psig (at saturated conditions). The temperature limit is based on the original plant design operating temperature for the piping downstream of the heat exchanger which is predicated on no flow bypass around the heat exchanger.

The FSAR, section 5.4.7.2.6, describes the manual operation of the RHR system in the shutdown cooling mode of operation. When reactor vessel pressure is 48 psig or less, a service water pump can be started and cooling water flow established through a RHR heat exchanger. The RHR pump suppression pool suction valve RHR-V-4A or RHR-V-4B is then closed and shutdown cooling isolation valves RHR-V-9 and RHR-V-8 are opened. Pump suction valve RHR-V-6A or RHR-V-6B is then opened. Pump suction piping is pre-warmed and flushed by opening valves to the radwaste system. These effluent valves to radwaste are then closed and the RHR pump is started. The cool down rate is controlled by adjusting the heat exchanger outlet valve and heat exchanger bypass valve to achieve the desired temperature of the water returning to the reactor vessel.

The FSAR and plant procedures require an operational limit different than that currently required by Technical Specification 3.4.9. The plant imposed requirement is more restrictive than the current Technical Specification RHR cut-in permissive limit associated with preventing an intersystem LOCA. The proposed change is based only on temperature and does not impact the pressure limit needed to prevent over pressurization of the system. This request for a change in this Technical Specification is submitted consistent with the referenced NRC Administrative Letter 98-10.

Additional information has been attached to this letter to complete the amendment request. Attachment 1 describes an evaluation of the proposed changes in accordance with 10CFR50.92 and concludes they do not result in a significant hazards consideration. Attachment 2 provides the Environmental Assessment Applicability Review and notes that the proposed change meets the eligibility criteria for a categorical exclusion as set forth in 10CFR51.22. Therefore, in accordance with 10CFR51.22, an environmental assessment of the change is not required. Attachment 3 provides marked up pages of the Technical Specifications and Bases. Attachment 4 consists of the typed Technical Specification pages as proposed by this amendment.

This request for an amendment has been approved by the WNP-2 Plant Operations Committee and reviewed by the Supply System Corporate Nuclear Safety Review Board. In accordance with 10CFR50.91, the state of Washington has been provided a copy of this letter.

Should you have any questions or desire additional information regarding this matter, please contact me or PJ Inserra at (509) 377-4147.

Respectfully,

GO Smith
Vice President, Generation
Mail Drop 927M

Attachments

cc: EW Merschoff - NRC RIV
JS Cushing - NRC NRR
NRC Senior Resident Inspector - 927N
PD Robinson - Winston & Strawn
DL Williams - BPA/1399
DJ Ross – EFSEC

STATE OF WASHINGTON)
)
)
)
)
COUNTY OF BENTON)

Subject: Operating License NPF-21
Request for Amendment
Technical Specification 3.4.9
Residual Heat Removal Shutdown
Cooling System - Hot Shutdown

I, GO Smith, being duly sworn, subscribe to and say that I am the Vice President, Generation, for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief that the statements made in it are true.

DATE July 29, 1999

GO Smith
Vice President, Generation

On this date personally appeared before me GO Smith, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 29 day of July 1999

TANYA M. DEMYER
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES NOVEMBER 9, 2001

Notary Public in and for the
STATE OF WASHINGTON

Residing at Benton County

My Commission expires Nov. 9, 2001

Evaluation of Significant Hazards Considerations

Summary of Proposed Change

The Washington Public Power Supply System is requesting a revision to Technical Specification 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown." This amendment requests that the APPLICABILITY for this Technical Specification be changed from, "MODE 3 with reactor steam dome pressure less than the RHR cut-in permissive pressure," to "MODE 3 with reactor steam dome pressure less than 48 psig." This amendment also requests changes to the notes associated with Technical Specification SR 3.4.9.1 and SR 3.5.1.2.

Technical Specification 3.4.9 defines the requirements for when RHR Shutdown Cooling (SDC) is required to be operable. The Applicability statement establishes RHR Shutdown Cooling mode is to be operable below the cut-in permissive. The RHR cut-in permissive instrumentation is specified under LCO 3.3.6.1, Function 5e as RHR SDC Isolation Reactor Vessel Pressure - High. The allowable value of the RHR SDC Reactor Pressure - High is established at less than or equal to 135 psig. This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario and credit for the interlock is not assumed in the accident or transient analysis in the Final Safety Analysis Report (FSAR). Isolation of the RHR system, if reactor pressure exceeds this value, provides this equipment protection. The isolation logic for LCO 3.3.6.1 Function 5e is based only on reactor pressure. The SDC mode of the RHR system is not initiated at the actual setpoint of the RHR SDC Reactor Pressure - High (i.e., cut-in permissive) because of temperature limitations associated with the system. The original design temperature limitation for shutdown cooling mode was 335° F corresponding to a saturation pressure of 95 psig for the portion of the system upstream of the heat exchanger and 295° F for the portion downstream of the heat exchanger. These original design temperatures further substantiate that the "cut-in permissive" function was intended to provide pressure protection only.

A change in the method of operation of RHR in the shutdown cooling mode was made in 1989. This change was made to eliminate the degradation of the RHR return valves due to cavitation during shutdown cooling operation at reduced flow conditions. Since 1989, RHR is operated in shutdown cooling by maintaining high flow through the pumps at all times, with vessel cool-down being controlled by throttling the amount of flow allowed through the heat exchanger and its bypass. The operation of the RHR system using this method to control the cool-down rate results in a temperature limit of 295° F because of the potential of exposing the piping downstream of the heat exchanger to beyond analyzed conditions. This temperature limit results in a RHR pressure limit for shutdown cooling of 48 psig. The temperature limit is based on the original plant design operating temperature for the piping downstream of the heat exchanger with no flow bypass around the heat exchanger.

No Significant Hazards Consideration Determination

The Washington Public Power Supply System has evaluated the proposed change to the Technical Specifications using the criteria established in 10CFR50.92(c) and has determined that it does not represent a significant hazards consideration as described below:

The operation of WNP-2 in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

This change involves further restrictions on the use of RHR in the shutdown cooling mode of operation during hot shutdown conditions. Chapter 15 of the FSAR defines the start of hot shutdown as the point when generated power is below one percent rated power. During entry into hot shutdown conditions the RHR system will be aligned in the Low Pressure Coolant Injection (LPCI) mode of operation. Thus, it will be aligned to provide water to the Reactor Pressure Vessel in the event the high pressure systems (HPCS and RCIC) are not able to perform this function. The change being proposed here has no impact on loss of coolant accidents (LOCAs) requiring mitigation using RHR aligned in the LPCI mode of operation.

During the high pressure portion of the hot shutdown condition, intersystem (LOCAs) are a concern.. The purpose of the RHR SDC Isolation Reactor Pressure - High (cut-in permissive) at 135 psig is to prevent over-pressurization of portions of the RHR system. This protection is not being modified by this change. The instrumentation that provides this protection will continue to function as designed. This change only impacts the applicability of Technical Specification 3.4.9 and when RHR SDC is required to be operable.

During hot shutdown the reactor is normally cooled down through use of the main steam system and the condenser. Other means of cooling are also available using the reactor water cleanup system or a combination of emergency core cooling system (ECCS) pumps and safety relief valves (SRVs). The RHR system aligned in the SDC mode is used at the end of this cooling process to reach cold shutdown conditions of less than or equal to 200° F. The change being proposed results in the RHR SDC being manually initiated at a lower pressure and temperature. This change will have no significant impact on the capability to cool the reactor.

FSAR Chapter 15, "Accident Analysis," describes two events associated with the RHR system. FSAR section 15.1.6, "Inadvertent Residual Heat Removal Shutdown Cooling Operation," describes the impact of system operation during startup or cool-down when the reactor is near critical. The proposed change involves the point at which RHR is started in the SDC mode with the reactor sub-critical with control rods inserted. Therefore, there will be no change in the probability or consequences of this accident.

FSAR section 15.2.9, "Failure of Residual Heat Removal Shutdown Cooling," describes the failure of the RHR system to function in SDC mode. This evaluation assumes a failure of the SDC mode of operation but does not disable the remaining modes of RHR operation. The alternate shutdown cooling paths involve the use of the SRVs to establish a cooling path to the containment suppression pool. This evaluated accident does not result in any fuel failure. The proposed change will not result in any fuel failures. The evaluated accident does result in normal coolant activity being released to the suppression pool through the safety relief valves. The proposed activity will not result in a significant change in the release of this coolant activity.

The proposed change will not cause a significant increase in the probability of a loss of SDC accident. This change proposes a delay in the use of SDC because of temperature limitations. During this time other means of decay heat removal would be used. This will result in a decrease in use of RHR in SDC mode and a decrease in the probability of failure of the system by restricting operation to be within analyzed temperature limits. The proposed change will not involve a significant increase in the consequences of the loss of shutdown cooling accident. The accident evaluated in the FSAR assumes SDC does not operate at any time and alternate means of cooling are evaluated. Section 15.2.9.6 states there is no fuel failure and release is limited to normal primary coolant activity to the suppression pool. The proposed change results in a short delay in the use of SDC because of temperature limitations. The accident described in FSAR section 15.2.9 bounds this condition and, as a result, there will be no increase in accident consequences.

With multiple means of reactor water makeup and heat removal available the restriction in the use of RHR caused by this change will not result in a significant increase in the probability or consequences of an accident previously evaluated.

The operation of WNP-2 in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change will not cause any new inadvertent shutdown cooling startup, loss of water inventory or loss of cooling accidents. New or different inadvertent RHR·SDC startup accidents are not possible because this change is only a further restriction on when the system is operated. The LOCA accidents during Mode 3 are bounded by the LOCAs defined for Modes 1 and 2. No new primary system LOCAs can be initiated because of this change. The purpose of the RHR cut-in permissive at 135 psig is to prevent over-pressurization of portions of the RHR system that could cause an intersystem LOCA. This change will not result in a new or different kind of intersystem LOCA because this is only a further restriction on RHR SDC operation. The use of RHR in the SDC mode is restricted to operation at a lower pressure and temperature but other systems are available to remove the decay heat. No new or different accidents are created because of this change.

The FSAR section 15.2.9 accident, "Failure of Residual Heat Removal Shutdown Cooling," is bounding for all other accidents which postulate failure of the capability to remove decay heat. No additional accidents resulting in the loss of decay heat removal capability will be caused by this change.

Therefore, the operation of WNP-2 in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The operation of WNP-2 in accordance with the proposed amendment will not involve a significant reduction in the margin of safety.

The proposed amendment will increase the reliability of the RHR system when operated in shutdown cooling mode by providing assurance that the temperature limits of the piping and pipe supports will not be exceeded. The ability to protect against an intersystem LOCA is unchanged. The ability to remove decay heat from the reactor is not changed by this modification as alternate means of heat removal are available. Therefore, operation of WNP-2 in accordance with the proposed amendment will not involve a reduction in the margin of safety.

Environmental Assessment Applicability Review

The Washington Public Power Supply System has evaluated the proposed amendment against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21.

The proposed change meets the criteria for categorical exclusion as provided for in 10CFR51.22(c)(9). The change requested does not pose a significant hazards consideration nor does it involve an increase in the amounts, or a change in the types, of any effluent that may be released off-site.

Furthermore, this proposed change does not involve an increase in individual or cumulative occupational exposure.