Washington Public Power Supply System
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February 6, 1986
G01-86-0035

Docket No. 50-460

Director of Nuclear Reactor Regulation
Attention: Mr. J. F. Stolz, Project Director
PWR Project Directorate No. 6
Division of PWR Licensing-B
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: **NUCLEAR PROJECT NO. 1**
RESPONSE TO REQUESTS FOR INFORMATION
REGARDING REGULATORY GUIDE 1.97

Reference: Letter, dated November 19, 1985, E.G. Adensam to D.W. Mazur, same subject

The reference included requests for information regarding the implementation of Regulatory Guide 1.97 for WNP-1. Our response is provided in the attachment to this letter.

The reference also invited comments on any misinterpretation of our previous responses. It has become apparent to us that your consultant did not have available the latest information we had submitted at the time of their review.

It appears that the consultant reviewed the FSAR material (i.e., Table 7.5-4) as it was initially submitted. This material was significantly changed in Amendment No. 1 which was docketed on October 29, 1982. The consultant's report is dated May 1985. Additional changes to this material have been made in subsequent amendments to the FSAR.

Our response is based upon the FSAR as it exists today; that is revised through Amendment No. 4. As indicated in the attachment, many of the requests for information are resolved by the additional commitments made by the FSAR amendments submitted.

G. C. Sorensen, Manager
Regulatory Programs (280)

GCS:GLW:AGH:pd

Attachment

cc: Mr. G. Dicks, NRC
Mr. J.R. Lewis, BPA (399)
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ATTACHMENT

1.0 Introduction

This attachment provides the response to requests for information regarding the WNP-1 design to implement the guidance of RG 1.97. Based on the comments and requests in the Interim Technical Evaluation Report it is concluded that the NRC Consultant reviewed the initial submittal of FSAR Table 7.5-4. Since the time of that initial submittal there have been four amendments to the FSAR which provided changes to the table that supply most of the information requested. Our response in this attachment is organized as follows:

- Additional information and justification (2.0) - Items are addressed in the same order as they are addressed in the Consultant's evaluation report.

- Summary of information to be provided later (3.0) - Based on FSAR Table 7.5-4, Amendment 4, this is a list of information that remains to be provided later.

- Summary of deviation from RG 1.97, Rev. 3 - The initial submittal of FSAR Table 7.5-4 was based on Revision 2 of the Regulatory Guide, but the current Table 7.5-4 (Amendment 4) is based on Revision 3. This is a listing of deviations noted in the current table. Justification for these deviations is addressed by the notes which accompany the table.

Any further reviews of the WNP-1 design should be based on the information provided by FSAR Amendment 4. There are some minor changes to be made to the table that will be included in Amendment 5 which is scheduled for submittal in May, 1986. Draft pages to be changed have been included at the end of this attachment to support reviews that may be scheduled before May 1986.

2.0 Additional Information and Justification

This section addresses the request for additional information and justification in the Interim Technical Evaluation Report and the letter of November 19, 1985 to the Supply System. Items are addressed in the same order as they are addressed in the Consultant's evaluation report.

2.1 Type of Variables (3.2)

The listing of Type A variables reviewed by the Consultant differs from the current list in FSAR Table 7.5-4, Amendment 4. Two variables, steam line radiation and RCS cold leg temperature, have been deleted from the list. The remaining (8) variables are the same as those reviewed, and each is in compliance with category (1) requirements as recommended by RG 1.97, Rev. 3.

2.2 **Information to be provided later - Washington Public Power Supply System is to provide range and category information for the thirteen listed variables, identify any deviation and justify those identified deviations. (Section 3.3.1)**

Response: The thirteen variables are addressed in the order listed in the evaluation report.

1. Steam line radiation - this variable has been deleted as a Type A, and is now listed in FSAR Table 7.5-4 as a Type E: Vent from Steam Generator Safety Relief Valves and Atmospheric Dump Valves. It is category (2) and the range provided is 10^{0} to 10^{6} mR/hr. which conforms to the guidance of RG 1.97, Rev. 3.

2. Neutron Flux - This variable is category (1) and the range provided is 10^{-9}% to 200% Full Power which exceeds the guidance of RG 1.97, Rev. 3 for range.

3. Coolant level in reactor - RG 1.97, Rev. 3 lists this as "coolant inventory", and the WNP-1 design provides three measurements which meet category (1) requirements:

   - Reactor vessel head level - 0-15 ft. H_2O
   - RC hot leg level - full range - 0-75 ft. H_2O
   - RC hot leg level - Narrow range - 0-10ft. H_2O

   This conforms to the guidance of RG 1.97, Rev. 3. Refer to FSAR Subsection 1.10.1, response to Item II.F.2 for discussion.

4. Radioactivity concentration or radiation level in circulating primary coolant - This variable is category (3) and the range provided is 1 mR/hr. to 10^{5} mR/hr. The justification for deviation of category is addressed in FSAR Table 7.5-4, Note 4.

5. Pressurizer heater status - The category remains to be provided later. The range is 0-220 Amp.

6. Quench tank temperature (RC Drain Tank for WNP-1) - This variable is category (3) and the range provided is 50 to 400F. The justification for deviation of range is addressed in FSAR Table 7.5-4, Note 8.

7. Emergency ventilation damper position - All information remains to be provided later.

8. Status of standby power and other energy sources important to safety - Four variables are monitored and all measurements meet category (2) requirements. The ranges and devices monitored are listed in FSAR Table 7.5-4. All conform to the guidance of RG 1.97, Rev. 3.

9. Vent from steam generator safety relief valves or atmospheric dump valves - The variable monitored is steam line radiation, and it is category (2) and the range provided is 10^{0} to 10^{6} mR/hr. which conforms to the guidance of RG 1.97, Rev. 3.

10. Radiation exposure rate - FSAR Table 12.3-4 is a tabulation of Area Radiation Monitors provided for WNP-1, and includes the ranges for each. The justification for deviation of range is provided in FSAR Table 7.5-4, Note 15. This same justification has been reviewed by the NRC Consultant and found to be acceptable. All monitors meet category (3) which conforms to the guidance of RG 1.97, Rev. 3.

11. Airborne radiohalogens and particulates - see item (13) below.

12. Plant and environs radiation - see item (13) below.

13. Plant and environs radioactivity -
Items 11, 12 and 13 are monitored by sampling and/or portable instrumentation provided by the Plant Health Physics/Chemistry Department. The equipment to be utilized will have adequate ranges and analysis capability. All equipment of this type satisfies the requirements for category (3) which conforms to the guidance of RG 1.97, Rev. 3.

2.3 **Radiation monitoring instrumentation - environmental qualification should be addressed in accordance with 10CFR50.49. (Section 3.3.2)**

Response: These items are addressed in the same order as listed in Section 3.3.2 of the evaluation report.

1. Radiation exposure rate (Type C) - The current submittal is based on RG 1.97, Rev. 3 which no longer includes this as a Type C variable. See response to item (3) below.

2. Effluent radioactivity - noble gases (Type C) - These measurements are not applicable to WNP-1 because WNP-1 utilizes a common plant vent. These are monitored by the Type E variable at that location - see item (5) below.

3. Radiation exposure rate (Type E) - RG 1.97, Rev. 3 lists these measurements as category (3), and therefore there are no requirements for environmental qualification. The monitors provided by WNP-1 conform to the guidance for category (3).

4. Condenser air removal system exhaust (Type E) - RG 1.97, Rev. 3 lists this measurement as category (2) which includes requirements for environmental qualification. Conformance remains to be addressed later.

5. Common plant vent (Type E) - RG 1.97, Rev. 3 lists this measurement as category (2) which includes requirements for environmental qualification. The effluent gaseous monitor (EGM-3) provided by WNP-1 to monitor this location conforms to the guidance for category (2) including qualification.

6. All other identified release points (Type E) - RG 1.97, Rev. 3 lists this measurement as category (2) which includes requirements for environmental qualification. For the WNP-1 design there is one other release point: Gland Steam Exhaust that is monitored by an effluent gaseous monitor (EGM-5). Conformance remains to be addressed later.

2.4 **Heat removal by containment fan heat removal system - Washington Public Power Supply System should identify the method of monitoring heat removal by the containment fan heat removal system or justify why it is not required. (Section 3.3.5)**

Response: As discussed in FSAR Section 6.2, containment heat removal for loss of coolant and main steam line break accidents is by operation of the Containment Spray System and the Decay Heat Removal System. The design analysis in Section 6.2.2 establishes that adequate heat removal is provided without reliance on the containment fan heat removal system.

2.5 **Make up flow-in - environment qualification should be addressed in accordance with 10CFR50.49. (Section 3.3.6)**

Response: The measurement provided meets the requirements for category (3) which do not require environmental qualification. The justification for this deviation of category is addressed in FSAR Table 7.5-4, Note 12. This variable is not required for the mitigation of an accident, and during design basis events the Make-up System is isolated.

2.6 **Letdown flow-out - environmental qualification should be addressed in accordance with 10CFR50.49. (Section 3.3.7)**

Response: The measurement provided meets the requirements for category (3) which do not require environmental qualification. The justification for this deviation of category is addressed in FSAR Table 7.5-4, Note 13. This variable is not required for the mitigation of an accident, and during design basis events the letdown line is isolated.

2.7 **Volume control tank level - environmental qualification should be addressed in accordance with 10CFR50.49. (Section 3.3.8)**

Response: The volume control tank is the Make-up tank in the WNP-1 design. The measurement provided meets the requirements for category (3) which do not require environmental qualification. The justification for this deviation of category is addressed in FSAR Table 7.5-4, Note 14. This variable is not required for the mitigation of an accident, and during design basis events the Make-up tank outlet is isolated.

3.0 Summary of Information To Be Provided Later

This section provides a list of information which will be provided later. This information is not yet available because of circumstances associated with the construction delay of WNP-1.

Variable	Information To Be Provided Later
• Pressurizer Heater Status	Category. Design includes indication of heater current, but the category to be provided is not resolved.
• Emergency Ventilation Damper Position	All Information.
• Condenser Air Removal System Exhaust	Category and power supply
• Vent from Steam Generator Safety Relief Valves or Atmos. Dump Valves	Power Supply
• Gland Steam Exhaust	Category and power supply
• Safety/Relief Valve Positions	All information for Code Safety Valves.

4.0 Summary of Deviation From RG 1.97, Rev. 3

This section provides a list of deviation in the design of WNP-1 instrumentation as compared with the guidance of RG 1.97, Rev. 3. Although the WNP-1 design exceeds the recommendations for range, power supply and/or indication for many of the variables, the following list is limited to those which are less than the recommendations. The basis for each deviation is addressed in the notes which follow Table 7.5-4, Amendment 4 of the FSAR.

Variable	Deviation
• Pressurizer Level	Range.
• RCS Soluable Boron concentration	Range for on-line display only. Grab sample facility conforms to guidance.
• Radioactivity Concentration or Radiation Level in Circulating Primary Coolant	Category.
• Accumulator Tank Level	Range. This deviation has been addressed by the NRC Consultant and found to be acceptable.
• RC Drain Tank Temperature	Range.
• Main Feedwater Flow	Range. This deviation has been addressed by the NRC Consultant and found to be acceptable.
• Containment Sump Water Temperature	Category.
• Make-up Flow-In	Category.
• Letdown Flow-Out	Category
• Make-up Tank Level	Category and range.
• Radiation Exposure Rate	Range. This deviation has been addressed by the NRC Consultant and found to be acceptable.

TABLE 7.5-4
(Sheet 3 of 43)

CONFORMANCE TO REGULATORY GUIDE 1.97, REV. 3

Variable Recommended Per RG 1.97, Rev. 3	Category	Range	WNP-1 INSTRUMENTATION PROVIDED				
			Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
Type A (Plant Specific)							
- RC Hot Leg Water Temp.	1	50-750 F	RCS-TE-3A4 (Hot Leg A)	1E VPN A	SCI-1 RCS-TI-3A3	SCI-3 RCS-TR-3A3	Conforms to guidance.
50-700 F			RCS-TE-3B4 (Hot Leg B)	1E VPN B	SCI-1 RCS-TI-3B3	SCI-3 RCS-TR-3B3	
			RCS-TE-3A2 (Hot Leg A)	1E VPN B	CRT	CRT	
			RCS-TE-3B2 (Hot Leg B)	1E VPN A	CRT	CRT	
- RCS Pressure 0-3000 psig	1	0-3000 psig	RCS-PT-16-1	1E VPN A	SCI-1 RCS-PI-16-3	CRT	Conforms to guidance.
			RCS-PT-16-2	1E VPN B	SCI-1 RCS-PI-16-4	SCI-3 RCS-PR-16	
- Pressurizer Level	1	0-400 in.	RCS-LT-14-5	1E VPN A	SCI-1 RCS-LI-14-3	CRT	Conforms to guidance, except for range. See Note 1
Bottom to Top			RCS-LT-14-6	1E VPN B	SCI-1 RCS-LI-14-4	SCI-3 RCS-LR-14-2	

Variable Recommended Per RG 1.97, Rev. 3	WNP-1 INSTRUMENTATION PROVIDED						
Type B (Continued)	Category	Range	Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
- Core Exit Temp. (Cont'd)				1E VPN-B	CRT	SCI-3 IMS-TR-3B2	Quadrant 3 (continued)
				1E VPN A	CRT	SCI-3 IMS-TR-4A1	Quadrant 4
				1E VPN A	CRT	SCI-3 IMS-TR-4A2	Conforms to guidance.
				1E VPN B	CRT	SCI-3 IMS-TR-4B1	
				1E VPN B	CRT	SCI-3 IMS-TR-4B2	
- Coolant Inventory o Bottom of hot leg to top of vessel. o Category 1	1	Reactor Vessel Head Level 0-15 ft. H_2O	RCS-LT-24A (Hot Leg A)	1E VPN A	SCI-1 RCS-LI-24A	~~CRT~~ SCI-3 RCS-LR-24A	Conforms to guidance.
			RCS-LT-24B (Hot Leg B)	1E VPN B	SCI-1 RCS-LI-24B	CRT	Refer to Subsection 1.10.1, response to Item II.F.2 for discussion.
		RC Hot Leg Level-Full Range 0-75 ft. H_2O	RCS-LT-22A (Hot Leg A)	1E VPN A	SCI-1 RCS-LI-22A	CRT	
			RCS-LT-22B (Hot Leg B)	1E VPN B	SCI-1 RCS-LI-22B	CRT	
		RC Hot Leg Level-Narrow Range 0-10 ft. H_2O	RCS-LT-26A (Hot Leg A)	1E VPN A	PCC-LW RCS-LI-26A	CRT	
			RCS-LT-26B (Hot Leg B)	1E VPN B	PCC-LW RCS-LI-26B	CRT	

TABLE 7.5-4
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Variable Recommended Per RG 1.97, Rev. 3 Type D	WNP-1 INSTRUMENTATION PROVIDED						
	Category	Range	Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
- DHR System Flow o 0 to 110% design flow o Category 2	2	0 to 7000 GPM (Design flow is 5000 GPM)	DHR-FT-2A	1E VPN A	SCI-1 DHR-FI-2A	None	Conforms to guidance.
			DHR-FT-2B	1E VPN B	SCI-1 DHR-FI-2B	None	
- DHR Heat Exchanger Outlet Temperature o 40 F to 350 F o Category 2	2	40 F to 400 F	DHR-TE-4A	1E VPN A	SCI-1 DHR-TI-4A	None	Conforms to guidance.
			DHR-TE-4B	1E VPN B	SCI-1 DHR-TI-4B	None	
- Core Flood Tank (Accumulator) Level o 10% to 90% Volume o Category 2	2	0 to 21 ft.	CFS-LT-3A1 (Tank 1A)	1E VPN A	SCI-1 CFS-LI-3A1	None	Conforms to guidance, except for range. See Note 6
			CFS-LT-3A2 (Tank 1A)	1E VPN B	SCI-1 CFS-LI-3A2	None	
			CFS-LT-3B1 (Tank 2B)	1E VPN A	SCI-1 CFS-LI-3B1	None	
			CFS-LT-3B2 (Tank 2B)	1E VPN B	SCI-1 CFS-LI-3B2	None	

TABLE 7.5-4
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Variable Recommended Per RG 1.97, Rev. 3	WNP-1 INSTRUMENTATION PROVIDED						
	Category	Range	Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
Type D (Continued)							
- RC Drain Tank Level (Quench Tank) o Bottom to Top o Category 3	3	0 to 100%	DFR-LT-2605	APN X	PCC-RS DFR-LI-2605	None	Conforms to guidance.
- RC Drain Tank Temperature o 50 F to 750 F o Category 3	3	50 to 400 F	DFR-TE-2046	APN X	PCC-RS DFR-TI-2046	None	Conforms to guidance, except for range. See Note 8.
- RC Drain Tank Pressure o 0 to Design Pressure o Category 3	3	0 to 100 psig	DFR-PT-2616	APN X	PCC-RS DFR-PI-2616	None	Conforms to guidance.
- Steam Generator Level o Category 1	1	0-600 in.	-	-	-	-	See previous listing for Type A variable.

TABLE 7.5-4
(Sheet 33 of 43)

Variable Recommended Per RG 1.97, Rev. 3	WNP-1 INSTRUMENTATION PROVIDED						
	Category	Range	Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
Type E							
- Containment Area Radiation - High Range o 1 R/hr to 10^7 R/hr o Category 1	1	10^{-2} R/hr to 10^7 R/hr	-	-	-	-	See previous listing for Type C variable.
- Radiation Exposure Rate o 10^{-1} R/hr to 10^4 R/hr o Category 3	3	Refer to Table 12.3-4	Refer to Table 12.3-4	APN X	CRT	CRT	Conforms to guidance, except for range. See Note 15
- Containment or Purge Effluent	-	-	-	-	-	-	WNP-1 design has common plant vent.
- Reactor Shield Building Annulus	-	-	-	-	-	-	Not in design.
- Auxiliary Building	-	-	-	-	-	-	WNP-1 design has common plant vent.

TABLE 7.5-4
(Sheet 24 of 43)

Variable Recommended Per RG 1.97, Rev. 3	WNP-1 INSTRUMENTATION PROVIDED						
Type D (Continued)	Category	Range	Sensor Tag No.	Power Supply	Indicator Panel/Tag No.	Recorder Panel/Tag No.	Comments
- Main Feedwater Flow o 0 to 110% Design Flow o Category 3	3	0 to 9 x 10^6 lb/hr (0 to 109% design flow)	FWS-FT-2A1 (Loop A)	APN X	NSP FWS-FI-2A (Input Selectable)	PCC-CS FWS-FR-19A (Input Selectable)	Conforms to guidance, except for range.
			FWS-FT-2A2 (Loop A)	APN X			
			FWS-FT-2B1 (Loop B)	APN X	NSP FWS-FI-2B (Input Selectable)	PCC-CS FWS-FR-19B (Input Selectable)	
			FWS-FT-2B2 (Loop B)	APN X			
- Auxiliary Feedwater Flow o 0 to 110% Design Flow o Category 1	1	0-1600 GPM	FWA-FT-4010 (To SG-1)	1E VPN A	PCC-LS FWA-FI-4010	SCI-3 FWA-FR-4010	Conforms to guidance.
			FWA-FT-6793 (To SG-2)	1E VPN A	PCC-LS FWA-FI-6793	CRT	
			FWA-FT-4008 (To SG-2)	1E VPN B	PCC-LS FWA-FI-4008	SCI-3 FWA-FR-4008	
			FWA-FT-6794 (To SG-1)	1E VPN B	PCC-LS FWA-FI-6794	CRT	