



Department of Energy
Washington, D.C. 20545

Docket No. 50-537
HQ:S:82:095

SEP 24 1982

Mr. Paul S. Check, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Check:

MEETING SUMMARY FOR INSTRUMENTATION (CHAPTER 7) WORKING MEETING,
SEPTEMBER 21 and 22, 1982

The purpose of this letter is to summarize the resolution of items discussed between the NRC Instrumentation and Control Branch and the CRBRP Project on September 21 and 22, 1982.

Enclosure 1 is the agenda used for the meeting, Enclosure 2 contains the resolution and commitments regarding the items discussed. "Resolved, Info Identified", indicates the discussion of the items led to a satisfactory understanding of the item and no further action is required. "Additional Info Req'd (Date)", indicates additional information needs to be provided, the Comment column describes the action. The "NRC Review Req'd", indicates the items for which NRC will conduct an additional review of material on the docket. Resolution dates are identified. Enclosure 3 is the list of attendees.

Any questions regarding the information provided or further activities can be addressed to M. R. Rosecky (FTS 626-6149) or Mr. A. Meller (FTS 626-6355) of the Project Office Oak Ridge Staff.

Sincerely,

John R. Longenecker
Acting Director, Office of the
Clinch River Breeder Reactor
Plant Project
Office of Nuclear Energy

Enclosures

cc: Service List
Standard Distribution
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D001

NRC WORKING GROUP MEETING

September 21 and 22, 1982

"CRBRP PSAR Chapter 7"

AGENDA

Section 7.1 Introduction

- o Listing of Safety Related Instrumentation
- o I&C Design Criteria
 - Instrument Errors
 - PPS Basis
 - Diversity
 - Application of Reg. Guides
- o Compliance with IEEE 279
- o Justification of Analyses
- o TMI Requirements
- o Nonsafety Related Systems Requirements

Section 7.2 Reactor Shutdown System

- o RSS--Additional Discussion Requested
 - Single Failure Criterion for Power Supplies
 - Single Failure Criterion and Channel Independence
 - Seismic Qualification for Safety Related
 - RSS Bypass Capability
 - Diversity between RSS Primary and Secondary Logic
 - Compliance with IEEE 279
 - Response Time
- o PPS Monitor Design and Criteria
- o General Design Criterion

Section 7.3 Engineering Safety Feature Instrumentation and Control

- o Provide Discussion for all ESFs from Table 6.1-1
- o Correct Table 7.1-6 Error
- o ESF Design Criteria for Power Supplies
 - Independence
 - Isolation
 - Redundancy
 - Single Failure Criteria/Common Mode Failure
 - Environmental Qualification/Seismic Qualification

- o Discuss ESF Instrumentation Diversity
- o Sodium Leak Detection--as ESF
- o ESF Response Time = 200 msec
- o Cold Trap Isolation--as ESF
- o General Design Criteria for ESF Instrumentation
- o TMI Requirements

Section 7.4 Instrumentation & Control Systems Required for Safe Shutdown

- o Address Relationship of PHTS, IHTS and SGS with SHRS
- o Discuss Design of I&C for PHTS, IHTS and SGS
- o Discuss Design Criteria for Power Sources
 - Independence
 - Redundancy
- o Environmental Qualification/Seismic Qualification for Power Supplies
- o Discuss Safe Shutdown Systems Diversity--DHRS
- o Discuss DHRS Instrumentation
 - Independence
 - Separation
 - Isolation
 - Diversity
- o Discuss Remote Shutdown
- o Discuss Role of OSIS
- o Discuss Power Supply Independence--Single Failure Criterion

Section 7.5 Instrumentation and Monitoring System

- o Discuss (Other Than RSS) Safety Related System Display Information
- o Discuss Information Readout Design
 - Application of IEEE 279
- o Response to IE Bulletin 79-27
- o Provide Design Information on Safety Related Systems
 - Isolation--PPS and Non-PPS
 - Informational Instrumentation
 - Annunciation
 - Instrument Location
 - Data Acquisition Interfacing
- o Discuss Flux Monitoring Design w/r to RSS
- o Source Range Monitoring--Nonsafety Related
- o Sodium Level Signals not Provided to PDH&DS
- o Sodium Leak Detection System--Describe
- o Provide Bypass & Interlock Discussion (7.5.6.1.3)

- o Describe Systems for
 - Hydrogen Monitoring
 - Containment Vessel Temperature Monitoring
 - Containment Atmosphere Temperature Monitoring
 - Containment Vessel Pressure Monitoring
- c Describe Instruments
- o Instrumentation for Radiation Monitoring (7.5)
- o Provide Design Criteria for Systems Important to Safety
- o TMI Requirements
- o Is PDH&DS Important to Safe Operation
- o Delay Neutron Detection--Nonsafety Related

Section 7.6 Other Instrumentation & Control Systems Required for Safety

- o Discuss Application of Design Criteria--Reg. Guides, IEEE, etc.
- o DHRS--Application of Single Failure Criterion, Redundancy
- o HVAC--Application of Criteria for Safety Related Systems
- o Discuss Fuel Handling and Storage Safety Interlock System
- o Discuss
 - Structural Concrete Cooling System
 - SGB Flooding Protection System
 - Inert Gas Blanketing systems
 - Auxiliary Liquid Metal System
 - Sodium Purification System

Section 7.7 Instrumentation & Control Systems Not Required for Safety

- o Discuss and Provide Design Criteria for Rod Position Indication System and Turbine Bypass System
- o Discuss Compliance with GDC 13 for Nonsafety Related Systems
- o Discuss General Design Criteria 28 and 29

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd *	Comments
1. 7.1 Listing of Safety Related Inst.		X (10/4/82)		Define "Safety Related" in Table 7.1.1. Assure consistency with H. Denton Memo, and verify adequacy of Table 7.5-1. Differentiation between NSSS and BOP Supplier is not required.
2. I & C Design Criteria - inst. error		X (10/4/82)		Add note to Table 7.2-3 to clarify what's included in the response times, i.e. sensor to output of signal conditioner, and note 200 msec additional time for rod release.
3.		X (10/4/82)		Review 15.1.4.1-4, 15.31.1.1.a and Table 1.3-3 for potential conflicts. Correct confusing discussions.
4. - tech. basis		X (11/1/82)		PSAR page 7.1-3, clarify PPS primary/secondary separation requirements in terms of RG.1.75 among redundant channels of prime & sec - systems and between prime & sec systems.
5. - diversity	X			No issues with regard to 7.1
6. - appl. of reg. guides		X (12/6/82)		Discussion of Reg Guide in Section 7.1 will be updated.
7. IEEE 279	X			No issues with regard to Section 7.1
8. Justification of Analysis	X			CRBR commits to a systematic analysis to show the single failure criteria of IEEE 379 has been met. The analysis will be done on the RSS and ESF for which IEEE 379 is an applicable criteria and will be available prior to the OL.
TMI Requirements				
9. 11.D.3			X	See App. H 11.D.3. Discuss cover gas relief valve/relief valve indication (NRC)
10. 11.E.1.2			X	See App. H 11.E.1.2
11. 11.E.4.2			X	See App. H 11.E.4.2
12. 11.F.1			X	See App. H 11.E.F.1
13. 11.F.3			X	See App. H 11.F.3
14. 11.K.1			X	See App. H 11.K
15. 11.K.3			X	See App. H. 11.K
16. Non-Safety Related System Requirements	X			Discussed further in Section 7.5

* NRC Staff will provide information by 10/23/82.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.2 Reactor Shutdown System				
RSS				
17.	- single failure criterion for PS and channel independence	X (11/1/82)		Discuss isolation techniques between primary and secondary systems - add this to the PSAR. Particularly address commonality at the inverter.
18.		X (11/1/82)		Provide a description of test results or test plans to demonstrate that faults within a PS or a trip channel will not propagate in such a way as to compromise trip channels associated with more than one vital bus.
19.			X	NRC to review QR 421.7
20.	- seismic qualification X			Seismic Qualification is addressed in Chapter 3.
21.	- RSS bypass capability	X (10/4/82)		Delete existing two loop operation I&C. Correct PSAR.
22.		X (10/4/82)		Provide revised Figure 7.2- 2A. Place in PSAR.
23.	- diversity - RSS primary and secondary logic	X (10/4/82)		Add additional discussion on diversity and figure on diversity.
	- IEEE 279 X			Resolution obtained on Section 3 of IEEE 279.
25.	- response time	X (10/4/82)		See Section 7.1 item 2 and 3.
26.	PPS Monitor Design and Criteria		X	NRC will evaluate Monitor usage.
General Design Criteria				
27.	- GDC21 (CRBR19)		X	NRC will examine system test techniques and capabilities (see PPS monitor also)
28.	- GDC (CRBR20) X			Resolved
29.	- fail safe (FMEA) X			Resolved (see item 8)
30.	- GDC 24, IEEE-279 X			Resolved
31.	Q421.9	X (10/4/82)		Verify that there are no cases where a control system xmitter and a protection system system xmitter are connected to a common sensor or input line - Revise Q 421.9 accordingly.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.3 ESF, I & C				
32.	Discussion of Table 6.1 ESF's	X (12/1/82)		Provide more detailed design (including diversity) criteria discussion of ESF I&C in the PSAR. (CIS discussion is acceptable, containment systems branch is addressing sensor diversity). (Reference 7.4 for SGAHRS and 7.6 for DHRS)
33.	Correct Table 7.1-6 Error (page 3.1-20)	X (10/4/82)		The error will be corrected. Check Table of Contents also.
34.	ESF Design Criteria for Power Supplies	X		Resolved
35.	Discuss ESF Instrumentation Diversity	X (12/1/82)		See Item 32
36.	SHRS Classification	X		Resolved
37.	Sodium Leak Detection-as ESF	X Meeting Date		No I&C action required at this time. Open item pending Leak Detection/Piping Integrity Meetings.
38.	Cold Trap Isolation	X		This area is being reviewed by other NRC branches.
39.	QR421.16-1E80-06 (Emergency Mode/Reset)		X	NRC will review Question/Response 421.16.
40.	GDC29 for ESF Inst.	X		Resolved
41.	TMI Requirements		X	See Item 11
42.	QR 421.45	X (11/1/82)		Amend QR421.45 to clarify there are no safety related sensor lines exposed to outside temperatures - (water and steam lines).
43.	QR 421.42	X (10/4/82)		PO needs to supply response.
44.	QR 421.33	X		Resolved
45.	QR 421.47		X	NRC will review QR 421.47

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.4 I&C Systems Required for Safe Shutdown				
46.	Address relationship of PHTS IHTS and SGS with SHRS	X (12/1/82)		Add to the PSAR a summary of DHRS instrumentation and control design criteria and how it is independent and separate from the SGAHRS I&C. Verify in PSAR that DHRS I&C is safety related and separate from SGAHRS I&C.
47.	Discuss Design of I&C for PHTS, IHTS & SGS	X (10/4/82)		Confirm power supplies & I&C to pony motors is safety related.
48.	Discuss Design Criteria for Power Sources	X		Resolved
49.	Environmental Qual/ Seismic Qualifications for Power Supplies	X		Resolved. See Chapter 3 of PSAR.
50.	Safe Shutdown Systems Diversity - DHRS	X Meeting Date		Defer to October DHRS meeting for determination of DHRS System Diversity.
51.	DHRS Instrumentation	X (12/1/82)		Determine if there are any interlocks which are process dependent and are used to place the Direct Heat Removal System into service.
52.	Discuss Remote Shutdown	X (12/1/82)		P.O. to provide item by item response to NRC positions on RMS; NRC provided their latest position on Remote Shutdown Systems. Revise QR421.17.
53.	Discuss Role of OSIS	X		Resolved
54.	Q 421.04		X	NRC to review the response.
55.	Discuss Power Supply Independence - Single Failure Criterion	X		See item 17 and 18.
56.	Q 421.26	X (11/1/82)		Amend to clarify which items are safety related and include rationale why non-safety related items are classified as such.
57.	Q 421.48		X	NRC to review response.
58.	Q 421.18		X	Staff needs to review QR421.18
59.	Q 421.38	X		Design Information to be provided later.
60.	Q 421.51		X	NRC review of response required.
61.	Q 421.52		X	NRC review of response required.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.5 Instrumentation and Monitoring System				
62.		X (11/1/82) (12/6/82)		Provide a summary description of the alarms and indicators for the PPS and ESF's.
63.			X	See previous item and QR760.6 (Accident Monitoring).
64.			X	NRC to review Description of Bulletin compliance. A review consistent with IE 79-27 is in progress.
65.			X	NRC review of QR760.6 required.
66.	X			Not considered appropriate at CP stage.
67.			X	NRC to review QR421.15.
68.			X	Open pending LPM system definition
69.		X		See Item 70.
70.			X	Consider making primary FMS system comparable to PWR's. No resolution. NRC believes Source Range Section should be safety related and part of the RSS.
71.		X (10/4/82)		Q421.34 will answer questions.
72.	X			Resolved
73.			X	Core performance branch will consider whether this should be safety related.
74.			X	Core performance branch will assess whether the system is safety related.
75.	X			Response to 421.49 is satisfactory.
76.				Defer to future meeting on leak detection. See items 37. Questions/Responses 36, 37, 39 are under NRC review.
77.		X (NA)		Information to be provided in PSAR as design progresses.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
78.	Containment Monitoring System		X	NRC I&C review of CRBRP-3 required.
79.	Describe Information Instruments.	X		Discussed previously. See Item 62.
80.	Radiation Monitoring System	X (10/4/82)		Information in Ch. 11 & 12 is being revised. Draft copies provided. Update PSAR. Radiation Assessment Branch will review the Radiation Monitoring System.
81.	Design Criteria	X		Resolved.
82.	TMI Requirements		X	NRC review of Appendix H required.
83.	PDH&DS/Process Control System	X		Section 7.7 and response to 760.06 satisfied the item.
84.	Delayed Neutron Detection System (Non-Safety Related)		X	Not an I&C Branch item. NRC CRBRP Project Office will be the lead review.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.6 Other I&C Systems Required for Safety				
85. Single Failure Criterion for DHRS		X Meeting Date		Subject of a future meeting.
86. HVAC			X	Amendment 71 Sept. 82 provides information on HVAC.
87. Fuel Handling and Storage Safety Interlock System		X (10/4/82)	X	Review of auxiliary Systems Branch required also. Typographical error in introduction of PSAR 7.6 will be corrected. This is not a safety related system.
88. Structural Concrete Cooling System		X (10/4/82)		PSAR will be clarified regarding requirements for structural concrete cooling.
89. SGB Flood Protection System		X (11/4/82)		Provide summary of I&C system functional design, redundancy, and safety classification of non-safety I&C.
90. Inert Gas Blanketing System		X (11/1/82)		Provide summary of I&C system functional design, redundancy, and rationale for safety classification of I&C.
91. Auxiliary Liquid Metal System		X (11/1/82)		Provide summary of I&C system functional design, redundancy, and rationale for safety classification of I&C.
92. Sodium Purification System		X (11/1/82)		Provide summary of I&C system functional design, redundancy, and rationale for safety classification of I&C.

Item	Resolved Info Identified	Additional Info Req'd (Date)	NRC Review Req'd	Comments
7.7 I&C Not Required for Safety				
93. Design Criteria for Rod Position Indica- tion System & Turbine Bypass System	X			Section 4.2.3.5 and response to question 421.43 provide information about RD1.
94. Compliance with GDC 13 for Non-Safety Systems	X			Resolved.
95. Discuss GDC Criteria 28 and 29	X			Question/Response 421.2 addressed compliance with GDC 28 and 29.
96. Q421.19 (Control System Failures)		X (11/1/82)		Obtain copy of Westinghouse response to this concern on SNUPPS. Amend response.
97. Q421.21 (Hi-energy Line Breaks)	X			

ATTENDANCE SHEET
NRC CHAPTER 7 MEETING
September 9, 1982

John Humphreys	B&R
Angus Kimmons	W-OR
G. Macrae	W-WM
P. Planchon	W-OR
R. Rosecky	CRBRP-PO
D. Elias	CRBRP-PO
A. Meller	CRBRP-PO
N. Brown	WLLCO
B. Murphie	DOE HQ
G. Morrison	W-WM
J. McCormick	W-OR
H. Robinson	B&R
R. D. Capp	EG&G Bethesda
R. Haroldsen	EG&G Idaho
R. Vanderbeek	EG&G Idaho
E. Rossi	NRC/DIS/ICSB
David H. Moran	NRC/NRR/CRBRP
Dick Becker	NRC/NRR/CRBRP
Richard Stark	NRC/NRR/CRBRP