REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8201290423 DOC.DATE: 82/01/19 NOTARIZED: NO DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
BOUCHEY,G.D. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Forwards resolution re fuel design & plant operation,per 820106 telcon.Response answers Core Performance Branch concerns re channel box deflection,waterside corrosion, seismic LOCA leads analysis & online fuel failure detection.

DISTRIBUTION CODE: B001S COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 12
TITLE: PSAR/FSAR AMDTS and Related Correspondence

NOTES:2 copies all matl:PM. 05000397

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
ACTION:	A/D LICENSNG		1	0	LIC BR #2 BC		1	0
	LIC BR #2 LA		1	0	AULUCK,R.	01	1	1
INTERNAL:	ELD		1	0	IE	06	3	3
	IE/DEP/EPDB	35	1	1	IE/DEP/EPLB	36	3	3
	MPA		1	0	NRR/DE/CEB	11	1	1
	NRR/DE/EQB	13	3	3	NRR/DE/GB	28	2	2
	NRR/DE/HGEB	30	2	2	NRR/DE/MEB	18	1	1
	NRR/DE/MTEB	17	1	1	NRR/DE/QAB	21	1	1
	NRR/DE/SAB	24	1	1	NRR/DE/SEB	25	1	1
	NRR/DHFS/HFEB	40	1	1	NRR/DHFS/LQB	32	1	1
	NRR/DHFS/OLB	34	1	1	NRR/DHFS/PTRB	20	1	1
	NRR/DSI/AEB	26	1	1	NRR/DSI/ASB	27	1	1
	NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
	NRR/DSI/ETSB	12	1	1	NRR/DSI/ICSB	16	1	1
	NRR/DSI/PSB	19	1	1	NRR/DSI/RAB	22	1	1
	NRR/DSI/RSB	23	1	1	NRR/DST/LGB	33	1	1
	REG FILE	04	1	1				
EXTERNAL:	ACRS	41	16	16	BNL(AMDTS ONLY)		1	1
	FEMA-REP DIV	39	1	1	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	05	1	1
	NTIS		1	1				

TOTAL NUMBER OF COPIES REQUIRED: LTTR ~~63~~ 65 ENCL ~~58~~ 60

Washington Public Power Supply System
P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

January 19, 1982
G02-82-84
SS-L-02-PLP-82-003

Docket No. 50-397

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PROJECT NO. 2
CORE PERFORMANCE BRANCH CONCERNS,
RELATED DURING PHONE CALL JANUARY 6, 1982

The subject phone conversation related seven (7) NRC concerns relating to fuel design and plant operation. Attachment 1 lists those participating in the phone conversation and Attachment 2 lists the concerns and the WNP-2 resolution.

Very truly yours,

GD Bouchey

G. D. Bouchey, Deputy Director
Safety & Security

PLP/jca

Attachments

cc: R Auluck - NRC
WS Chin - BPA
R Feil - NRC Site

B001
s
1/1

PARTICIPANTS IN WNP-2/NRC DISCUSSION
RE: FUEL DESIGN AND
RELATED OPERATIONS - JANUARY 6, 1982

PL	Powell	-	Supply System
CM	Powers	-	Supply System
BM	Moore	-	Supply System
RM	Nelson	-	Supply System
A	Wood	-	Supply System
R	Auluck	-	NRC
M	Toker	-	NRC

Attachment 1

NRC CONCERNS -
WNP-2 RESOLUTION

1. Channel Box Deflections - This issue has been addressed in Appendix I to the WNP-2 FSAR as Licensing Review Group issue CPB-7 (attached).

2. Waterside Corrosion - This issue has been addressed in Appendix I to the WNP-2 FSAR as Licensing Review Group issue CPB-2 (attached).

3. Seismic LOCA Loads Analysis - This analysis is currently being performed by General Electric on behalf of the Licensing Review Group (LRG). WNP-2 is a participant in, and acts as chairman, of the LRG and will use the GE analysis to address this issue. Present schedule will meet a submittal by June 30, 1982.

4. Cladding Ballooning, Rupture and Flow Blockage - Presently, NRC staff is reviewing the General Electric generic document NEDO 20566 that addresses this issue. In the interim, the PCT margin below 2200°F is being requested by the staff to be allocated specifically to this concern. WNP-2 committs to relinguishing the PCT Margin (2200°F-1960°F) until the NRC review of NEDO 20566 is completed. At that time WNP-2 will reevaluate the PCT margin allocation based on the results of that review.

5. On Line Fuel Failure Detection - Fuel failure detection at WNP-2 is accomplished using the Main Steam Line Radiation Monitoring System and the Offgas Monitoring System (FSAR descriptions in Section 11.5). Possible gross fuel failure is alerted by a reactor scram and main steam line valve closure initiated at three (3) times full power background level by the main steam line radiation monitors (see Technical Specification Section 2.2, Limiting Safety System Instrumentation Setpoints). Gradual fission particle release increase is addressed by Technical Specification 3/4.4.5 (specific activity).

   It is felt that the combination of both systems and implementation of the applicable technical specifications adequately addresses on line fuel failure detection for WNP-2.

6. Post Irradiation Examination - WNP-2 will establish a routine fuel inspection program to provide information on irradiated and discharged fuel following each refueling. The program will involve visual examination of selected assemblies. Typically visual examination will be made by five to ten per cent of the discharged fuel, concentrating on the lead fuel bundles. Visual examination should include but not be limited to: crud buildup, rod bowing, missing components, etc. Additional fuel inspection should be performed depending on the results of operational monitoring including coolant activity, and the visual fuel inspection.

7. Additional Information in the Initial Core Fuel Design - The FSAR section describing the initial WNP-2 fuel design references a GE document that is presently out of date. WNP-2 and the NRC recognize that the appropriate GE document will not be available from GE until mid-January, 1982. In the interim the following information is forwarded for NRC review:

The WNP-2 initial core fuel bundles contains 62 fuel rods and 2 water rods. The fuel rods are helium backfilled to 3 ATM. This design is designated by General Electric as P8X8R meaning the fuel roads are prepressurized, the bundle has a 8 by 8 rod configuration (total of 64 rods) and the bundle is what is called a retrofit design.

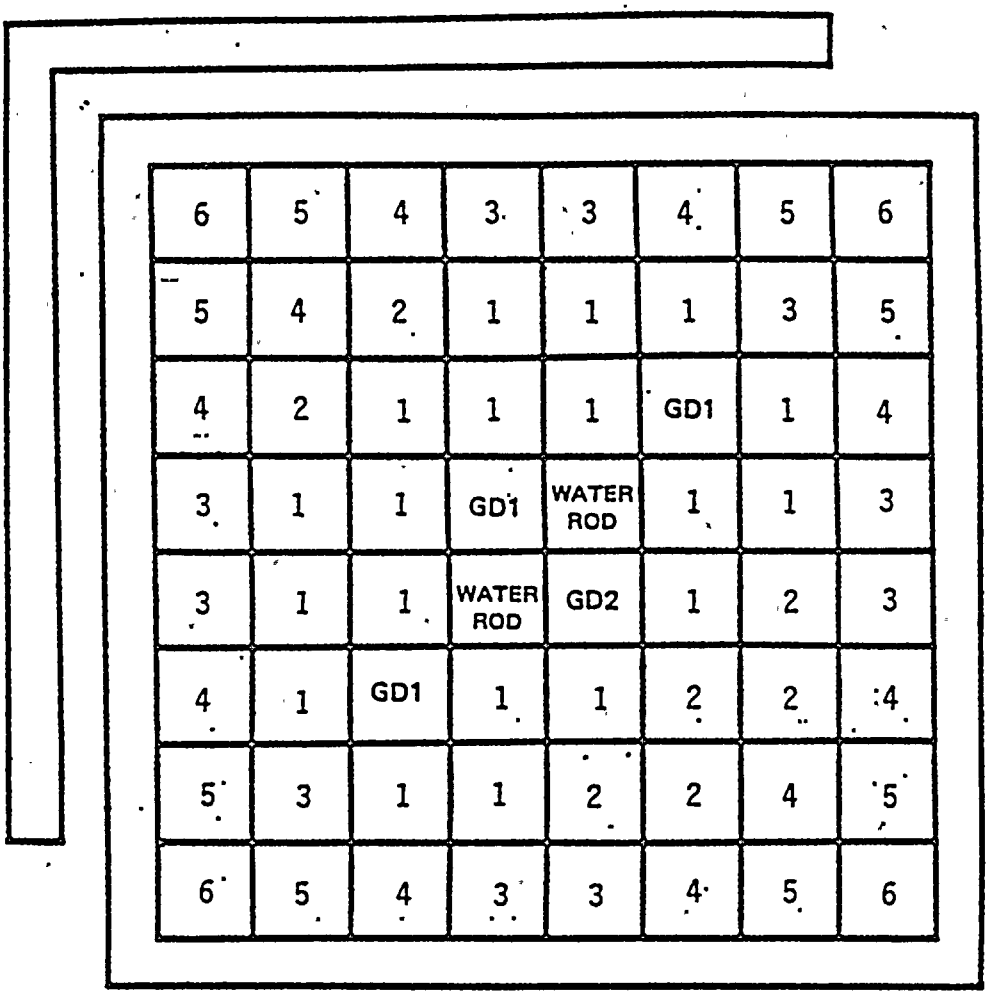
For the WNP-2 core, Table 1 gives general fuel rod parameters that describe the WNP-2 fuel. The three bundle types shown in Figures 1, 2 and 3 are loaded in a C-Lattice configuration in the quarter core pattern shown in Figure 4.

For a more detailed description of P8X8R fuel bundles and type C-Lattices, see Sections 1 and 2 of "Generic Reload Fuel Application", General Electric Co., December, 1981 (NEDO-24011-A-2).

TABLE 1

WNP-2 FUEL ROD PARAMETERS

Parameter	Initial Core
Rod Array	8 x 8
Number of Fuel Rods/Bundle	62
Fuel Rod Material	UO_2
Pellet Diameter (in.)	0.410
Pellet Length (in.)	0.410
Pellet Immersion Density (%) (Theoretical)	96
Clad Material	Zr-2
Clad I.D. (in.)	0.419
Clad O.D. (in.)	0.483
Clad Thickness (nominal) (in.)	0.032
Pellet Clad Gap (cold, nominal) (in.)	0.009
Active Fuel Length (in.)	150.0
Plenum Length (in.)	9.48
Fuel Rod Pitch (in.)	0.640
Number of Water Rods/Assembly	2
Water Rod O.D. (in.)	0.591
Number of Spacergrids/Assembly	7
Grid Material	Zr-4 with Iconel springs
End Fittings Material (rods)	Zircaloy
Fill Gas Pressure (He) (atm)	3.0
Total Core Weight (MTU)	139.3
Core Average Enrichment w/o ^{235}U	1.87



ROD TYPE	NO.	ENRICHMENT
1	19	3.00 W/O
2	7	2.60 W/O
3	10	2.20 W/O
4	10	2.00 W/O
5	8	1.70 W/O
6	4	1.30 W/O
GD1	3	1.70 W/O
GD2	1	1.70 W/O & 3.00 W/O

AVERAGE BUNDLE ENRICHMENT = 2.19 W/O
EXCLUDING NATURAL URANIUM ENDS = 2.33 W/O

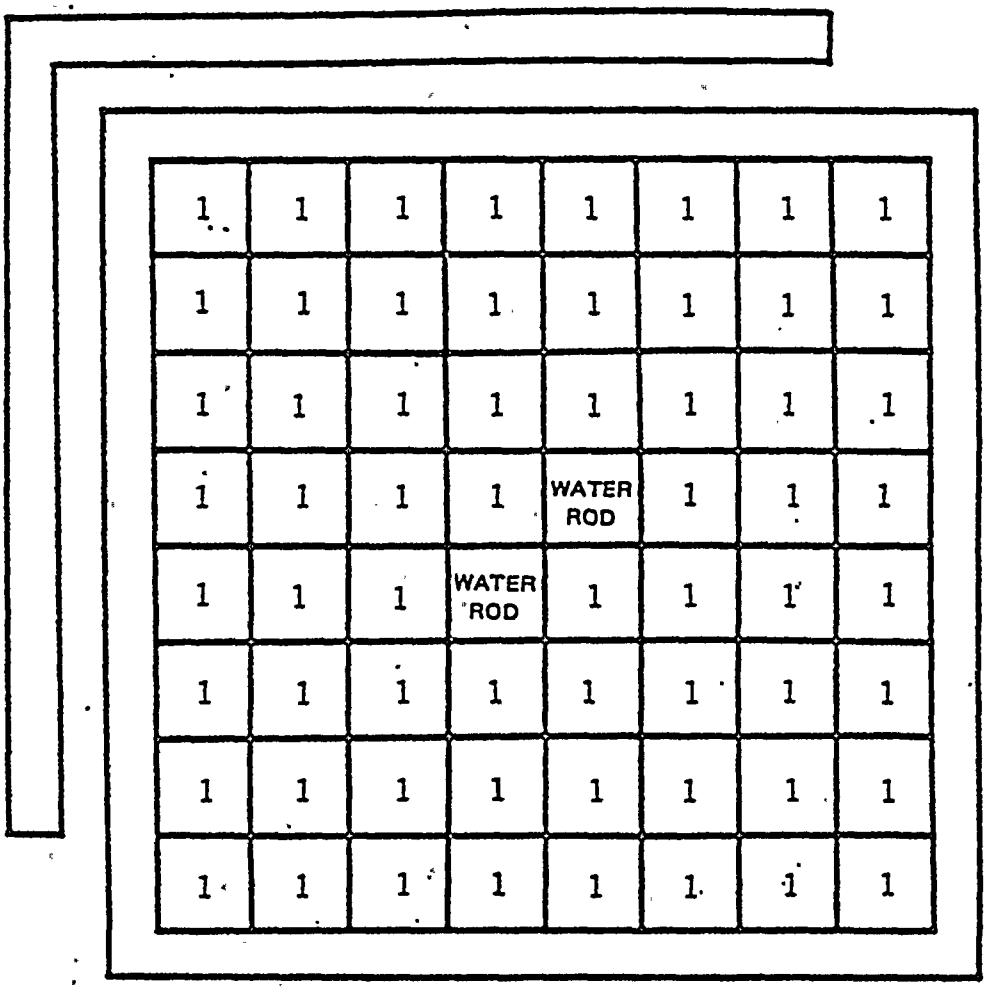
FIGURE 1 WNP-2 INITIAL CORE FUEL ASSEMBLY ENRICHMENT DISTRIBUTION MAP - HIGH ENRICHMENT BUNDLE

4	3	2	2	2	2	3	4
3	2	1	1	1	1	2	3
2	1	1	1	1	GD1	1	2
2	1	1	GD1	WATER ROD	1	1	2
2	1	1	WATER ROD	GD1	1	1	2
2	1	GD1	1	1	1	2	2
3	2	1	1	1	2	2	3
4	3	2	2	2	2	3	4

ROD TYPE	NO.	ENRICHMENT
1	24	2.20 W/O
2	22	1.70 W/O
3	8	1.50 W/O
4	4	1.20 W/O
GD1	4	1.70 W/O & 2.20 W/O

AVERAGE BUNDLE ENRICHMENT = 1.76 W/O
EXCLUDING NATURAL URANIUM ENDS = 1.83 W/O

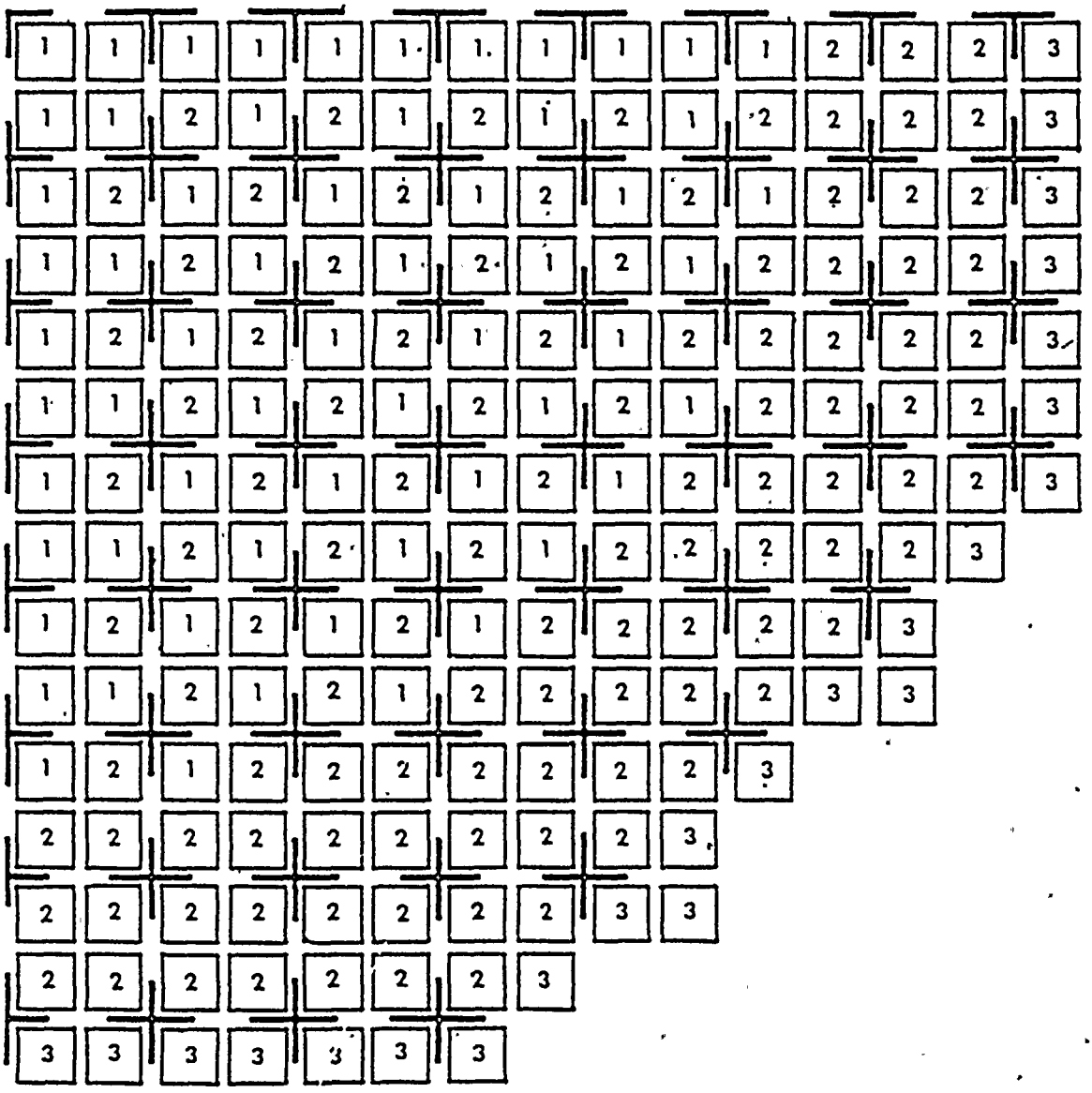
FIGURE 2 WNP-2 INITIAL CORE FUEL ASSEMBLY ENRICHMENT DISTRIBUTION MAP - LOW ENRICHMENT BUNDLE



ROD TYPE	NO.	ENRICHMENT
1.	62	0.71 W/O

AVERAGE BUNDLE ENRICHMENT = 0.71 W/O ^{235}U

FIGURE 3 WNP-2 INITIAL CORE FUEL ASSEMBLY ENRICHMENT DISTRIBUTION MAP - NATURAL URANIUM BUNDLE



FUEL TYPE	TOTAL NO.	ENRICHMENT
1	240	1.76 W/O
2	432	2.19 W/O
3	92	0.711 W/O

AVERAGE INITIAL CORE ENRICHMENT = 1.87 W/O ^{235}U

FIGURE 4 WNP-2 INITIAL CORE LOADING PATTERN - QUARTER CORE SYMMETRIC

ISSUE: CPB-2 WATERSIDE CORROSION

QUESTION:

The applicant has not addressed the potential for fuel corrosion failure similar to that which occurred at the Vermont Yankee plant.

RESPONSE:

As indicated in the General Electric presentation given to the NRC in December 1979, the failures appeared to be associated with a metallic incursion in the feedwater. This event has occurred only once in the BWR operating history and is unlikely to reoccur.

Subsequent to this event, General Electric provided an operation recommendation for corrosion product control which should preclude this type of event at WNP-2. The Supply System plans to employ those General Electric operating recommendations which have been proven to be effective at several operating BWR plants for maintaining water quality parameters at or below GE's water quality specification limits.

REFERENCES:

1. Letter from R. E. Engel (GE) to M. Tokar (NRC), MFN-172-80, "Corrosion Product Control", dated October 3, 1980.

ISSUE: CPB-7 CHANNEL BOX DEFLECTION

QUESTION:

The applicant has not referenced General Electric Licensing Topical Report NEDE-21354-P which describes the fuel channel design. Of specific concern is the commitment to control rod driveline friction testing recommended in Section 4.4.2 of NEDE-21354-P.

RESPONSE:

NEDE-21354-P is the Licensing Topical Report applicable to the WNP-2 design. Included in Section 4.4.2 of this report is a recommendation to conduct periodic control rod driveline friction tests. Operating experience with this channel design has demonstrated that excessive deflections and subsequent channel wear are unlikely. Consequently, the General Electric recommended periodic control rod driveline friction test is no longer necessary. The technical specification requirements for periodic scram time testing and rod notch testing would provide an indication of a pending driveline friction concern. Should either of these tests suggest a driveline friction problem, the pressure test described in NEDE-21534-P (4.4.2) would then be used to isolate the cause.