ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9101140192 DOC.DATE: 91/01/07 NOTARIZED: NO DOCKET #
FACIL:50-263 Monticello Nuclear Generating Plant, Northern States 05000263
AUTH.NAME AUTHOR AFFILIATION
PARKER,T.M. Northern States Power Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Requests approval for reuse of channel boxes in Cycle 15,per NRC Bulletin 90-002, "Loss of Thermal Margin Caused by Channel Box Bow." Evaluation encl.

DISTRIBUTION CODE: A001D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: OR Submittal: General Distribution

NOTES:NRR/LONG,W. 05000263

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD3-1 LA	1	1	PD3-1 PD	1	1
	LONG,B.	2	2			
INTERNAL:	NRR/DET/ECMB 9H	1	1	NRR/DET/ESGB	1	1
	NRR/DOEA/OTSB11	1	1	NRR/DST 8E2	1	1
	NRR/DST/SELB 8D	1	1	NRR/DST/SICB 7E	1	1
	NRR/DST/SRXB 8E	1	1	NUDOCS-ABSTRACT	1	1
	OC/LFMB	1	0	OGC/HDS1	1	0
	REG FILE 01	1	1	RES/DSIR/EIB	1	1
EXTERNAL:	NRC PDR	1	1	NSIC	1	1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 18 ENCL 16

RIDS/ADDS

RIDS/ADDS

wb A01

Northern States Power Company

414 Nicollet Mall
Minneapolis, Minnesota 55401-1927
Telephone (612) 330-5500

January 7, 1991

NRC Bulletin 90-02

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

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Request for Approval for the Reuse of Channel Boxes in Cycle 15

References:

1. Letter dated October 22, 1990 from William O Long, NRC to Thomas M Parker, titled: Safety Evaluation Report - Loss of Thermal Margin Caused by Channel Box Bow.

We request your approval for the reuse of channel boxes in Cycle 15. Reference 1 requires your evaluation of reuse of channel boxes on a cycle-specific basis. This evaluation must be completed prior to startup of Cycle 15 per Reference 1. Startup for Cycle 15 is planned for May 28, 1991. Our evaluation is attached.

Please contact us it you have questions concerning this submittal.

Thomas M Parker
Manager
Nuclear Support Services

c: Regional Administrator Region III, NRC
Senior Resident Inspector, NRC
NRR Project Manager, NRC
G Charnoff

A001
1/1

ATTACHMENT

MONTICELLO NUCLEAR GENERATING PLANT

Strategy for Channel Box Reuse in Cycle 15

In Cycle 15, there will be 200 reused channels (Cycle 14 contained 217 reused channels). Cycle 15 will contain the following number of bundle types:

Fuel Type	Number of Cycles of Operation	Number of Bundles	Number of Reused Channels
PB8X8R	4th	100	90
GE8X8EB	3rd	120	110
GE8X8NB	2nd	128	0
GE8X8NB3	1st	136	0
Total		484	200

In Cycle 15, a two-part approach to managing channel bow is planned[1]. Approach 1 will apply to the 100 PB8X8R bundles and the 28 GE8x8EB bundles which are all loaded in cells on the core periphery (See the shaded cell locations on the attached figure). Approach 2 will apply to the remaining 92 GE8X8EB bundles. These 92 bundles include 52 bundles loaded in Control Cells (See the attached figure, the outlined cells), 24 "almost peripheral" bundles (See attached figure, locations with the underlined "3"), and 16 bundles loaded in other non-Control Cell core interior locations.

The Approach 1 recognizes that bundles located in cells on the core periphery will operate at low powers throughout Cycle 15. Applying very conservative limits to these locations will not cause these bundles to become limiting. Thus, a very conservative approach can be applied to these bundles. That approach will include lowering the thermal limits (MCPR, MAPLHGR and MLHGR) used in the process computer databank such that these bundles will be calculated to operate closer to limits. These limits will be lowered an amount corresponding to the maximum bows expected for these peripheral channels. Thermal margin impact will be calculated using General Electric Nuclear Energy methodology.

Approach 2 applies to the remaining 92 GE8X8EB bundles which are loaded throughout the core. In this sub-batch, there are 78 reused channels where

---

[1] The approach will apply to all fuel types that have reused channels, not only to bundles having reused channels.

channel exposures are greater than 17 GWD/MT more than their associated fuel bundles. For these 78 reused channels, we will rechannel these bundles with lower exposure used channels. The replacement channels from the pool have exposures in the range of 27.5 to 38.5 GWD/MT. The channels currently installed on the 78 fuel bundles will have exposures in the range of 40.5 GWD/MT to 59 GWD/MT at the end of Cycle 14. Channels from the pool will be measured prior to being shuffled to the in-core bundles. Thus, this channel shuffling program will have two benefits: (1) it will place channels with well-quantified bows on the GE8X8EB bundles loaded in higher power locations in the core and (2) it will significantly lower the exposure of channels on these bundles to a range in which there is substantial measurement data regarding the rate of channel bow increase with exposure.

Approach 2 will handle the 92 bundles in the following fashion:

1. Bows for all 92 bundles will be well-quantified for one of the following reasons:

   (a) 78 channels will have been measured at the beginning of Cycle 15.

   (b) 6 channels will have lower exposures than their associated fuel bundles and can be conservatively treated as a first-bundle lifetime channel.

   (c) 5 channels' exposures will lead their associated bundle exposures by less than 9 GWD/MT.

   (d) 3 channels' exposures will lead their associated bundles exposures by less than 16.5 GWD/MT and were measured prior to use in Cycle 14.

   Note that for the 14 channels (group b, c and d) of these 92 bundles which will not have been measured immediately prior to Cycle 15, their exposures will be within exposure ranges where there is abundant data to support channel bow prediction methodologies. Process computer fuel type libraries with R-factors corresponding to the appropriate bow will be used to determine operating CPR values for these bundles. These libraries will be generated by GE Nuclear Energy using their methodology, since they will be providing the 3D-Monicore databank update for Cycle 15.

2. For MAPLHGR and MLHGR, the limits in the process computer databank will be lowered by an amount corresponding to the effect of incremental channel bow from the difference in exposure between a fuel channel and its associated fuel bundle. Thus, for example, if the fuel channel has 10 GWD/MT more exposure than its associated fuel bundle, the MLHGR and MAPLHGR limits will be lowered by an amount to compensate for channel bow accumulated from that 10 GWD/MT of incremental channel exposure. This thermal margin impact will be calculated using GE Nuclear Energy methodology.

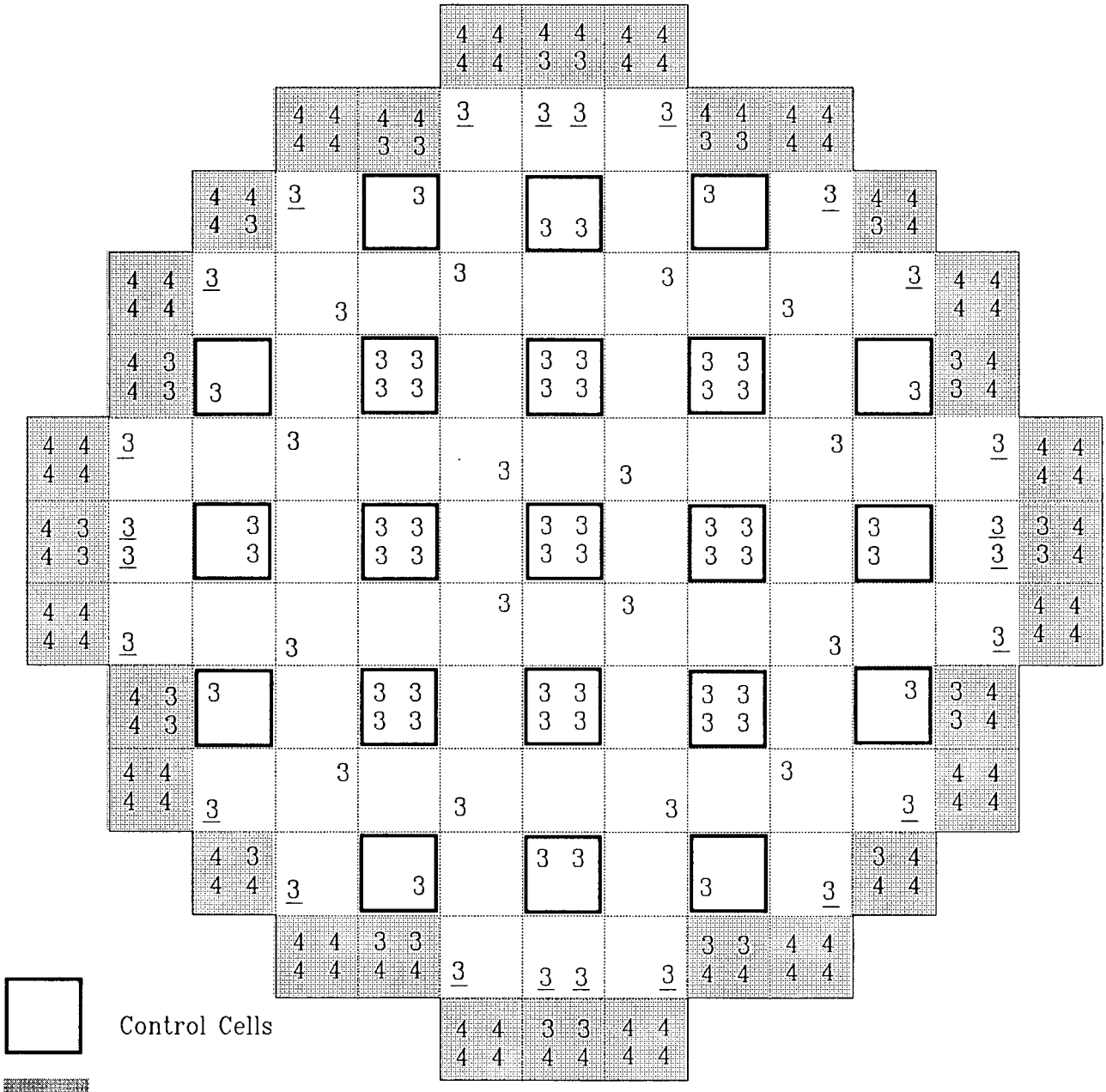
For the 264 GE8X8NB and GE8X8NB-3 bundles loaded in the Cycle 15 core with new channels, the effect of channel bow on CPR will be modeled using the same approach that General Electric will use for BWR cores employing all first-bundle lifetime channels. Consistent with this approach, there will be no effect of channel bow on MAPLHGR or MLHGR modeled in the process computer for these bundle types.

Future Cycles

The approach described above will be applied in Cycle 16. In Cycle 16, the only core locations with reused channels will be on the core periphery. Thus only Approach 1 will be used in Cycle 16. In future cycles, we do not plan to reuse fuel channels.

Reuse Channel Box Locations for Cycle 15

Numbers "3" and "4" identify bundle locations containing fuel bundles in their third and fourth cycles of operation.



Control Cells

Approach 1 will be used on these locations

Underlined numbers identify Approach 2 locations which are considered to be "almost peripheral."