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 AUTH. NAME AUTHOR AFFILIATION
 FITZPATRICK, E. Indiana Michigan Power Co. (formerly Indiana & Michigan Ele
 RECIP. NAME RECIPIENT AFFILIATION
 MURLEY, T.E. Office of Nuclear Reactor Regulation, Director (Post 870411

SUBJECT: Forwards response to NRC Bulletin 89-001 Suppl 2 entitled,
 "Failure of Westinghouse Steam Generator Tube Mechanical
 Plugs."

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AEP:NRC:1096C

Donald C. Cook Nuclear Plant Units 1 and 2
License Nos. DPR-58 and DPR-74
Docket Nos. 50-315 and 50-316
RESPONSE TO NRC BULLETIN 89-01 SUPPLEMENT 2:
FAILURE OF WESTINGHOUSE STEAM GENERATOR TUBE
MECHANICAL PLUGS

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

Attn: T. E. Murley

July 29, 1991

Dear Dr. Murley:

This letter provides our response to NRC Bulletin 89-01 Supplement 2 entitled, "Failure of Westinghouse Steam Generator Tube Mechanical Plugs." The bulletin discusses problems with stress corrosion cracking of steam generator tube plugs supplied by Westinghouse. The response is specific to Unit 1 of the Cook Nuclear Plant. Unit 2 is operating in its second cycle following replacement of all steam generators and has no mechanical plugs installed.

The specific information requested in the bulletin is provided in the attachment to this letter. Our response is based on historical and current operating parameters for the Cook Nuclear Plant. We are currently considering implementing, within the existing technical specifications, a slight increase in the Unit 1 primary side operating temperatures. The impact of this change will be reviewed prior to implementation to determine its impact on the conclusions presented in the attachment to this letter.

NRC Bulletin 89-01 Supplement 2 pertains to plugs fabricated from Group 2 heats. Plugs fabricated from Group 1 heats were the topic of the original NRC Bulletin 89-01. As indicated in our letter AEP:NRC:1096B, dated May 30, 1991, 269 hot leg plugs from a group 1 heat were removed and replaced during the past Unit 1 refueling outage. The 269 plugs from the same heat installed in the cold legs

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Dr. T. E. Murley

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AEP:NRC:1096C

have sufficient remaining life such that repair or replacement is not necessary. (A letter dated June 4, 1991 from Colburn (NRC) to Fitzpatrick (I&M) incorrectly stated that 538 mechanical plugs were to have been replaced during the previous Unit 1 refueling outage.)

Our response to NRC Bulletin 89-01 Supplement 2 was requested to be made under oath or affirmation according to the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). As such, an oath is included with this letter.

Sincerely,

A handwritten signature in cursive script, appearing to read "E. E. Fitzpatrick".

E. E. Fitzpatrick
Vice President

ldp
Attachment

Dr. T. E. Murley

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AEP:NRC:1096C

cc: D. H. Williams, Jr.
A. A. Blind - Bridgman
J. R. Padgett
G. Charnoff
A. B. Davis - Region III
NRC Resident Inspector - Bridgman
NFEM Section Chief

Dr. T. E. Murley

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AEP:NRC:1096C

bc: S. J. Brewer/M. S. Ackerman
T. O. Argenta/R. F. Kroeger
J. G. Feinstein
M. L. Horvath - Bridgman
J. F. Kurgan
J. J. Markowsky
J. B. Shinnock
S. H. Steinhart/S. P. Hodge
T. Colburn, NRC - Washington, D.C.
DC-N-6015.1
AEP:NRC:1096C

STATE OF OHIO)
COUNTY OF FRANKLIN)

E. E. Fitzpatrick, being duly sworn, deposes and says that he is the Vice President of licensee Indiana Michigan Power Company, that he has read the foregoing response to NRC Bulletin 89-01 Supplement 2: Failure of Westinghouse Steam Generator Tube Mechanical Plugs and knows the contents thereof; and that said contents are true to the best of his knowledge and belief.

E. E. Fitzpatrick

Subscribed and sworn to before me this 26th

day of July, 1991.

Rita D. Hill
NOTARY PUBLIC

RITA D. HILL
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES 6-28-94

ATTACHMENT TO AEP:NRC:1096C
RESPONSE TO NRC BULLETIN 89-01

This attachment provides the information requested by NRC Bulletin No. 89-01, Supplement 2. The responses are applicable to Unit 1 of the Cook Nuclear Plant. Unit 2 is operating in its second cycle following replacement of all steam generators and has no mechanical plugs installed.

Action Item 1

Summary of Request

Verify that information contained in Table 2 of Addendum 2 to Westinghouse report WCAP-12244, Revision 3, titled "Steam Generator Tube Plug Integrity Summary Report" is correct for plugs fabricated from group 2 heats. Specifically, verify the number of Westinghouse mechanical plugs installed in the hot and cold legs of each steam generator, heat number and date of installation, and plug operating temperatures. Also, it should be stated if plants have not installed Westinghouse mechanical plugs from group 2 heats.

Response

The information contained in Table 2 of Westinghouse Report WCAP-12244, Revision 3, Addendum 2, dated June 1991, was reviewed for each steam generator to verify the number of Westinghouse mechanical plugs installed from group 2 heats in the hot leg and cold legs by heat number, date of installation, and operating temperatures. An inconsistency was found for the number of plugs installed and removed in steam generator No. 14 for August 1983. Two tubes were plugged in steam generator No. 14 in August 1983 requiring installation of two plugs on the hot leg and two plugs on the cold leg. Subsequently one of the hot leg plugs was removed during tube sample removal in September 1983 and the remaining tube hole on the hot leg plugged with a welded Inconel 600 plug. Westinghouse was informed of the inconsistency and has provided the attached corrected (non-proprietary) Table 2, dated July 11, 1991. No other inconsistencies were found in the table.

Action Item 2 a-f

Summary of Request

Addressees are requested to take the following actions, to be implemented initially during any refueling outage or extended outage (greater than four weeks) which ends 60 days or more following receipt of this bulletin and during all future refueling outages. For the period of time between receipt of the bulletin and 60 days, the actions requested in the original version of this bulletin continue to be applicable for plugs fabricated from group 1 heats.

Item 2 a)

Addressees should implement appropriate remedial actions (i.e., repair and/or replacement) for all plugs whose estimated lifetime in item 2b, below does not extend to the next refueling outage.

Item 2 b)

Remaining lifetime estimates (in effective full power days (EFPD)) are given in Table 2 of Reference 4 in the column entitled "Remain EFPD to MIN." These remaining lifetime estimates are relative to reference dates given in the column entitled "Reference CALC Dates." These remaining lifetime estimates may be used directly. These estimates should be adjusted to reflect any corrections noted in Actions Requested, item 1.

Response

Based on plug information contained in the attached table, no plugs require repair and/or replacement prior to the next refueling outage, which is tentatively scheduled for June 1992. Plugs will be repaired and/or replaced prior to exceeding the effective full power day limits listed in the table during future refueling outages.

Item 2 c)

For refueling outages or extended outages ending prior to November 30, 1991, remedial actions for plugs fabricated from NX-5222 may be deferred until the next scheduled refueling outage.

Response

No plugs from heat No. NX-5222 are installed in any of the steam generators.

Item 2 d)

Installation of Westinghouse mechanical plugs fabricated from Inconel 600 should be discontinued.

Response

Installation of Inconel 600 mechanical plugs has been discontinued. Mechanical plugs manufactured from thermally treated Inconel 690 are now being used to plug tubes.

Item 2 e)

If for any refueling outage, the addressee does not plan to satisfy items 2a to 2d above, an alternative plan for insuring plug integrity, with appropriate technical justification, should be submitted to the NRC at least 30 days before the end of the refueling outage.

Response

As previously stated in response to items 2a-d, plugs will be repaired and/or replaced prior to exceeding the effective full power day limits listed in the table. If these plans change, an alternative plan for ensuring plug integrity will be submitted to the NRC at least 30 days before the end of the refueling outage that occurs prior to the date of the remaining EFPD limit listed in the table.

Item 2 f)

Prior to any plug repairs or replacement, addressees are reminded that their responsibilities under ALARA require analysis of the various plug repair or replacement methods. In choosing a plug repair or replacement method, the licensee should consider the accessibility of the plugs and the dose reduction benefit of using robotic manipulators. Prior to plug repair or replacement, the licensee should consider steam generator decontamination and/or local shielding to reduce working area dose rates.

Response

ALARA considerations will be addressed when formulating plans for the repair or replacement activity. This will include the use of robotics and the appropriate employment of shielding and decontamination measures.

Alloy 600 Mechanical Plug
Date Revised: 07/11/91

Table 2: Westinghouse Alloy 600 Mechanical Plug Information

INSTALLATION DATA						TEMPERATURE DATA						PLUG DATA		EFPD DATA						STATUS				T/S
Std Plant Alpha	Plug Inst Date	No. of Plug	Plug Heat No.	S/G #	HL or CL	Previous Cycle (°F) (A)		New Cycle (°F) (A)		Total Scaling Factor (B)		Plug Size (in)	Min. Ug. (mils)	Initial EFPD to MIN (C)	Ref. Calc. Date (D)	EFPD Mult. Factor (E)	EFPD to Ref. Date (F)	Remain EFPD to MIN (C)	Year to Repair Plugs (G)	Notes	Plugs Re-pair-ed	Plugs Re-mov-ed	Joint Type (H)	
						HL	CL	HL	CL	Prev.	New													
	G											G		A, C, E										
	07-87	24	4523	13	HL	600.0	536.0	582.0	518.0			7/8		549	10/20/90	0.75	551.2	0	< Ref.	-	-	24	PR	
	07-87	69	4523	11	HL	600.0	536.0	582.0	518.0			7/8		549	10/20/90	0.75	551.2	0	< Ref.	-	-	69	PR	
	07-87	90	4523	14	HL	600.0	536.0	582.0	518.0			7/8		549	10/20/90	0.75	551.2	0	< Ref.	-	-	90	PR	
	07-87	86	4523	12	HL	600.0	536.0	582.0	518.0			7/8		549	10/20/90	0.75	551.2	0	< Ref.	-	-	86	PR	
	05-89	20	6323	14	HL	600.0	536.0	582.0	518.0			7/8		746	10/20/90	0.75	193.8	1156	1994	-	-	-	PR	
	05-89	93	6323	13	HL	600.0	536.0	582.0	518.0			7/8		746	10/20/90	0.75	193.8	1156	1994	-	-	-	PR	
	05-89	91	6323	11	HL	600.0	536.0	582.0	518.0			7/8		746	10/20/90	0.75	193.8	1156	1994	-	-	-	PR	
	05-89	40	6323	12	HL	600.0	536.0	582.0	518.0			7/8		746	10/20/90	0.75	193.8	1156	1994	-	-	-	PR	
	05-89	37	6135	14	HL	600.0	536.0	582.0	518.0			7/8		2272	10/20/90	0.75	193.8	4349	2005	-	-	-	PR	
	12-80	10	1989	11	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1830.7	6907	2014	-	-	-	PR	
	12-80	10	1989	14	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1830.7	6907	2014	-	-	-	PR	
	07-82	10	2387	12	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1567.1	7459	2016	-	-	-	PR	
	07-82	10	2387	13	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1567.1	7459	2016	-	-	-	PR	
	08-83	2	2387	14	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1302.1	8013	2018	-	-	-	PR	
	08-83	2	2387	11	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1302.1	8013	2018	-	-	-	PR	
	08-83	9	2387	13	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1302.1	8013	2018	-	-	-	PR	
	08-83	3	2387	12	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	1302.1	8013	2018	-	-	-	PR	
	06-85	5	2387	14	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	891.6	8872	2022	-	-	-	PR	
	06-85	6	2387	13	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	891.6	8872	2022	-	-	-	PR	
	06-85	8	2387	11	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	891.6	8872	2022	-	-	-	PR	
	06-85	9	2387	12	HL	600.0	536.0	582.0	518.0			7/8		5131	10/20/90	0.75	891.6	8872	2022	-	-	-	PR	
	07-87	90	4523	14	CL	600.0	536.0	582.0	518.0			7/8		8562	10/20/90	0.75	551.2	18511	2057	-	-	-	PR	
	07-87	86	4523	12	CL	600.0	536.0	582.0	518.0			7/8		8562	10/20/90	0.75	551.2	18511	2057	-	-	-	PR	
	07-87	24	4523	13	CL	600.0	536.0	582.0	518.0			7/8		8562	10/20/90	0.75	551.2	18511	2057	-	-	-	PR	
	07-87	69	4523	11	CL	600.0	536.0	582.0	518.0			7/8		8562	10/20/90	0.75	551.2	18511	2057	-	-	-	PR	
	05-89	40	6323	12	CL	600.0	536.0	582.0	518.0			7/8		11645	10/20/90	0.75	193.8	26459	2086	-	-	-	PR	
	05-89	91	6323	11	CL	600.0	536.0	582.0	518.0			7/8		11645	10/20/90	0.75	193.8	26459	2086	-	-	-	PR	
	05-89	93	6323	13	CL	600.0	536.0	582.0	518.0			7/8		11645	10/20/90	0.75	193.8	26459	2086	-	-	-	PR	
	05-89	57	6135	14	CL	600.0	536.0	582.0	518.0			7/8		35448	10/20/90	0.75	193.8	81461	2286	-	-	-	PR	
	12-80	10	1989	11	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1830.7	180756	2647	-	-	-	PR	
	12-80	10	1989	14	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1830.7	180756	2647	-	-	-	PR	
	07-82	10	2387	13	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1567.1	181366	2650	-	-	-	PR	
	07-82	10	2387	12	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1567.1	181366	2650	-	-	-	PR	
	08-83	9	2387	13	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1302.1	181978	2652	-	-	-	PR	
	08-83	2	2387	11	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1302.1	181978	2652	-	-	-	PR	
	08-83	3	2387	12	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1302.1	181978	2652	-	-	-	PR	

Alloy 600 Mechanical Plug
Date Revised: 07/11/91

Table 2: Westinghouse Alloy 600 Mechanical Plug Information

INSTALLATION DATA						TEMPERATURE DATA						PLUG DATA		EFPD DATA					STATUS				T/S Joint Type (H)	
Std Plant Alpha	Plug Inst Date	No. of Plug	Plug Heat No.	S/G #	HL or CL	Previous Cycle (°F) (A)		New Cycle (°F) (A)		Total Scaling Factor (B)		Plug Size (in)	Min. Lig. (mils)	Initial EFPD to MIN (C)	Ref. Calc. Date (D)	EFPD Mult. Factor (E)	EFPD to Ref. Date (F)	Remain EFPD to MIN (C)	Year to Repair Plugs (G)	Notes	Plugs Re- pair- ed	Plugs Re- mov- ed		
						HL	CL	HL	CL	Prev.	New													
	G											G		A, C, E										
	08-83	2	2387	14	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1302.1	181978	2652	-	-	-	PR	
	09-83	2	1989	14	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	1302.1	181978	2652	-	-	-	PR	
	06-85	9	2387	12	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	891.6	182926	2655	-	-	-	PR	
	06-85	5	2387	14	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	891.6	182926	2655	-	-	-	PR	
	06-85	8	2387	11	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	891.6	182926	2655	-	-	-	PR	
	06-85	6	2387	13	CL	600.0	536.0	582.0	518.0			7/8		80057	10/20/90	0.75	891.6	182926	2655	-	-	-	PR	