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WISCONSIN PUBLIC SERVICE CORPORATION

600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

July 13, 1990

10 CFR 50.55a

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

Gentlemen:

Docket 50-305 Operating License DPR-43 Kewaunee Nuclear Power Plant 1990 ISI Summary Report

As required by Wisconsin Administrative Code and Federal Regulation 10 CFR 50.55a, various inservice inspection (ISI) examinations were performed during the past refueling outage (March 3, 1990 to April 17, 1990). This refueling outage constituted the third inspection year of the 2nd period of the 2nd interval. The requirements for this inspection year are contained in US NRC Generic Letter 89-13; US NRC Bulletin 88-08, Supplement 3; US NRC Bulletin 89-02; and the 1980 Edition through Winter 1981 Addenda of Section XI, except for the governing examination requirements for component supports which are contained in the 1986 Edition of Section XI. These requirements were implemented in accordance with the "Kewaunee Nuclear Power Plant ISI Plan and Schedule - Second Ten Year Interval (1984-1994)", plant technical specifications, and nondestructive examination (NDE) procedures.

This past year, various code class 1, 2, and 3 component supports were examined; the tubesheet weld on steam generator 1A, casing weld on reactor coolant pump 1A, reactor vessel studs, and code class 1 and 2 piping were volumetrically examined; and the interior surfaces of several check valves were visually examined. Other code class 1, 2, and 3 components were visually inspected during various system pressure tests.

In addition to the aforementioned components requiring inspection, the following inspections were also performed: portions of the service water system were radiographed for detection of pits and corrosion; the inner diameter surface of the feedwater pipe at the feedwater ring header to both steam generators were visually examined for detection of erosion/corrosion; and pipe welds adjacent to the steam generator feedwater nozzles were radiographed for detection of cracks. Also, small bore snubber testing and eddy current testing of steam generator tubes were performed. These inspections were implemented in accordance with inhouse surveillance procedures and plant technical specifications.

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Document Control Desk July 13, 1990 Page 2

The inspections resulted in the following indications being reported on the bases of ISI procedure recording criteria, which is generally more restrictive than Section XI acceptance criteria:

- Eight (8) Recordable Indications were noted by Surface Examinations on Class 1 Piping, Pumps, and Welded Supports;
- 2. Fourteen (14) Recordable Indications were noted by Visual Examination on Class 1, 2, and 3 Component Supports and Class 1, 2, and 3 Valves; and
- 3. One Hundred Seventy Eight (178) Recordable Indications were noted by Visual Examination on Class 1, 2, and 3 Systems during Leakage Tests.

All of these indications have been evaluated and dispositioned (accepted, repaired/replaced, or monitored). Two (2) of them were evaluated by Wisconsin Public Service Corporation as exceeding the Table IWX-2500-1 acceptance criteria of Section XI. The indications that exceeded the acceptance criteria of Section XI are a bent plate on a main steam stanchion and a linear tool mark observed on a two-inch diameter reactor temperature detection pipe. Both of these conditions have been evaluated by Wisconsin Public Service Corporation and found to be acceptable for continued operation. In the future, as a precautionary measure, the bent plate will be removed from the stanchion. The tool mark will be re-examined to verify the integrity of the pipe.

The 1990 refueling outage steam generator tube eddy current inspection resulted in installation of one hundred twenty two (122) additional plugs in steam generator 1A: ninety seven (97) plugs were installed as a corrective measure and twenty five (25) plugs were installed as a preventative measure. One hundred nine (109) additional plugs were installed in steam generator 1B: seventy five (75) plugs were installed as a corrective measure and thirty four (34) plugs were installed as a preventative measure. Installation of these plugs resulted in a total of two hundred ninety eight (298) plugs in steam generator 1A and three hundred eighty (380) plugs in steam generator 1B. In addition to the plugged tubes, 3638 tubes were sleeved during previous outages, resulting in an equivalent plugging percent of 10.9% in SG A and 13.4% in SG B.

The corrective plugs were installed as a result of indications believed to have been caused by intergranular attack and outside diameter intergranular stress corrosion cracking. In order to further characterize steam generator tube eddy current indications at the Kewaunee Nuclear Power Plant, portions of two (2) defective tubes were removed from steam generator 1B during the 1990 refueling outage. The results of this work are not currently available as destructive testing, non-destructive testing, chemical analysis, and metallography of the two (2) defective tubes is ongoing at this time.

Because of the generic industry problem of primary water stress corrosion cracking of thermally treated Inconel 600 (heat numbers 3279, 3513, 3962, and 4523), the Kewaunee Nuclear Power Plant implemented a steam generator tube mechanical plug repair program during the 1990 refueling outage. The methodology defined in US NRC Bulletin 89-01 for estimating lifetime for steam generator Document Control Desk July 13, 1990 Page 3

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tube plugs from heats 3279, 3513, 3962, and 4523 required that a total of two hundred thirty two (232) plugs be repaired. Ninety one (91) plugs were corrected in steam generator 1A and one hundred forty one (141) plugs were corrected in steam generator 1B.

During the refueling outage, only four (4) welded repairs were performed to correct conditions noted during the inservice inspection. Two (2) Inconel plugs were welded into the open tubesheet holes that resulted from removal of the defective tubes from steam generator 1B; and, two sections of pipe were replaced in the service water system to correct for sedimentation buildup and pitting detected by radiography. Also, other welded repairs and alterations were performed over the last year (and during the refueling outage) due to design change work and replacements of components which had reached end life, etc. In accordance with the requirements of Wisconsin Administrative Code, Chapter ILHR 42, these welded repairs and alterations are approved/inspected by an authorized inspector and a record (Form SB-190) of each has been provided, as required, to the State of Wisconsin.

Please find attached a copy of the following documentation which summarizes the results of the inservice inspection:

- 1) NIS-1 Form for 3rd Outage, 2nd Period, 2nd Interval
- 2) Summary Report of 3rd Outage, 2nd Period, 2nd Interval
- Owner's Letter of Disposition for Items Reported During 3rd Outage, 2nd Period, 2nd Interval
- 4) Summary of Eddy Current Inspection of Steam Generator Tubes
- 5) Letter from K H Evers to US NRC dated May 4, 1990 titled, "Kewaunee Nuclear Power Plant Reportable Occurrence 90-005-00"
- 6) Welded Repair Records (Form SB-190)

The complete reports of these inspections are on file in the QA/QC records vault at the Kewaunee Nuclear Power Plant. These reports are available for review as deemed necessary.

Sincerely,

Uam Arinnardr

Hov K. H. Evers Manager - Nuclear Power

SLC/mjm Attachment cc - Mr. Patrick Castleman, US NRC US NRC, Region III

50-305 KEWAUNEE

1990 ISI SUMMARY REPORT

A.

REC'D W/LTR DTD 07/13/90...9007170259

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-NOTICE-

ATTACHMENT 1

Owner's Data Report

1990 Inservice Inspections

(Form NIS-1)

July 13, 1990

1. OWNER - WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONSI 54307

- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1

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- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR APPURTENANCE	MANUFACTURER OR OR INSTALLER S	UFACTURER INSTALLER ERIAL NO.	STATE OR Province NO.	NATIONAL Board No.
Reactor Vessel	Combustion Engineering	69202	4 <u>11</u> 480	21010
Pressurizer	Westinghouse	1151	u <u>11</u> 402	68-23
Steam Generator A	Westinghouse	1141	U <u>II</u> 400	692B
Steam Generator B	Westinghouse	1142	U <u>11</u> 401	6929
Excess L etdown Heat Exchanger 1A	Sentry	3996-5E	U11407	364
Excess Letdown Heat Exchanger 1B	Sentry	3996-6E	U11408	365
Class 1 Piping	Phillips Getschow			
Reactor Coolant Pump A	Westinghouse	RCPCP1-01		
Reactor Coolant Pump B	Westinghouse	RCPCP1-02		

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- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONSI 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	MANUFACTURER OR INSTALLER SERIAL NO	STATE OR Province no.	NATIONAL Board No.
Voiume Control Tank	Joseph Oat & Sons	1 787 -10	U11425	376
Seal Water Return Filer	AMF Cuno Division	123		2618
Reactor Coolant Filter	AMF Cuno Division	121		2616
Class 2 Plping	Phillips Getschow			
Class 3 Piping	Phillips Getschow			
Boric Acid Tank 1A	Joseph Oats & Sons	1 877 -1A		
Boric Acid Tank 1B	Joseph Oats & Sons	1 877 -18		
Boric Acid Filter	AMF Cuno Division	123		2617
Letdown Heat Exchanger	Atlas Inc.	1206	u <u>11</u> 405	1031

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1. OWNER - WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCON: 54307

- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1

.

- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER Or installer	MANUFACTURER OR INSTALLER SERIAL NO.	STATE OR Province NO.	NATIONAL Board No.
Seal Water Heat Exchanger	Atlas Inc.	734	U11404	596
Residual Heat Exchang er 1A	Joseph Oat & Sons	1817-1E	<u>411</u> 406	344
Residual Heat Exchanger 1B	Joseph Oat & Sons	1817-1F	<u>411</u> 424	345
Component Cooling Pump 1A	Ingersoll Rand	056831		
Component Cooling Pump 1B	Ingersoll Rand	0 867309		
Component Cooling Heat Exchanger 1A	Engineering Fab.	1574 8-A		1139
Component Cooling Heat Exchanger 1B	Engineering Fab.	15748-B		1140

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SHEET 4 OF 11

FORM NIS-1, OWNER'S DATA REPORT FOR INSERVICE INSPECTIONS AS REQUIRED BY THE PROVISIONS OF THE ASME CODE RULES

1. OWNER - WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONSI 54307

MANUEACTUDED

- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	OR INSTALLER SERIAL_NO	STATE OR PROVINCE NO.	NATIONAL Board No.
Residual Heat Removal Pump 1A	Byron Jackson	APCAPRH-01		
Residual Heat Removai Pump 18	Byron Jackson	APCAPRH-02		
Safety Injection Pump 1A	Bingham Pump	290696		
Safety Injection Pump 1B	Bingham Pump	290697		.
Containment Spray Pump 1A	Ingersoll Rand	067074		
Containment Spray Pump 1B	Ingersoll Rand	067075		



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- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCON 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	MANUFACTURER OR INSTALLER SERIAL NO.	STATE OR Province no.	NATIONAL Board No.
Component Cooling Surge Tank	Sharpsville Steel	WPSACATCC-1		714
Spent Fu el P ool Heat Exchanger	Struther Wells	1-68-06-1519		
Auxiliary Feedwater Pump 1A	Pacific Pump	46573		
Auxiliary Feedwater Pump 1B	Pacific Pump	46574		
Turbin e Drlven Auxiliary Feedwater Pump	Pacific Pump	46575		
Service Water Pump 1A1	Worthington Pump	VTP 27736		
Service Water Pump 1A2	Worthington Pump	VTP 27737		

- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONSI 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	MANUFACTURER Dr Installer Serial No.	STATE OR Province no.	NATIONAL Board No.
Service Water Pump 1B1	Worthington Pump	VTP 27738		
Service Water Pump 1B2	Worthington Pump	VTP 27739		
Service Water Pump 1A1 Strain e r	S.P. Kenney Engineer	'S		
Service Water Pump 1A2 Strain er	S.P. Kenney Engineer	'9		
Service Water Pump 181 Strainer	S.P. Kenney Engineer	'S		
Service Water Pump 182 Strainer	S.P. Kenney Engineer	s		
Diesel Generator 1A Cooling Water Heat Exchangers	Young Radiator	2310 93 & 231095	-	



- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONS 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR APPURTENANCE	MANUFACTURER Or installer	MANUFACTURER Or installer Serial No	STATE OR Province no.	NATIONAL Board No.
Dlesel Generator 18 Cooling Water Heat Exchangers	Young Radiator	231094 & 231096		
Sp en t Fuel Pooi Pump 1A	Gould Pump	786A519-1		~-
Spent Fu el Pool Pump 1B	Gould Pump	786A519-2		
Auxiliary Building Fan Floor Fan Coil Unit 1A				
Auxiliary Building Fan Floor Fan Coil Unit 1B				

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2.	PLANT - KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
3.	PLANT UNIT - NO. 1
4.	OWNER CERTIFICATE OF AUTHORIZATION - N/A
5.	COMMERCIAL SERVICE DATE - JUNE 16, 1974
6.	NATIONAL BOARD NUMBER FOR UNIT - N/A
7.	COMPONENTS INSPECTED -

OWNER _ WISCONSIN DUDLIG OFFICIAL



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- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONS 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- COMMERCIAL SERVICE DATE JUNE 16, 1974 5.
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	MANUFACTURER OR INSTALLER SERIAL NO	STATE OR Province no.	NATIONAL BOARD NO.
Battery Room Fan Coll Unit 1A				
Battery Room Fan Coil Unit 1B				
Auxlliary Building Basement Fan Coil Unit 1A				
Auxiliary Building Basement Fan Coil Unit 1B				
Charging Pump 1C Fan Coil				

- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONS 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 18, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	OR INSTALLER SERIAL NO.	STATE OR PROVINCE NO.	NATIONAL Board No.
Control Room Air Conditioning Chiller 1A				
Control Room Air Conditioning Chiller 1B				
Component Cooling Pump 18 Fan Coil				
Residual Heat Pump Pit Fan Coil Unit 1A				
Residual Heat Pump Pit Fan Coil Unit 1B				

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- 1. OWNER WISCONSIN PUBLIC SERVICE CORPORATION, P.O. BOX 19002, GREEN BAY, WISCONS 54307
- 2. PLANT KEWAUNEE, ROUTE 1, P.O. BOX 48, KEWAUNEE, WISCONSIN 54216
- 3. PLANT UNIT No. 1
- 4. OWNER CERTIFICATE OF AUTHORIZATION N/A
- 5. COMMERCIAL SERVICE DATE JUNE 16, 1974
- 6. NATIONAL BOARD NUMBER FOR UNIT N/A
- 7. COMPONENTS INSPECTED -

COMPONENT OR Appurtenance	MANUFACTURER OR INSTALLER	OR INSTALLER SERIAL NO.	STATE OR Province no.	NATIONAL Board No.
Auxiliary Building Mezzanine Fan Coii Unit 1A	÷-			
Auxiliary Building Mezzanine Fan Coil Unit 1B				

8.	Examination Dates	3-13-90	to	4-21-90	
9	Inspection Interval from	6-16-84	to	6-16-94	

10. Abstract of Exeminations. Include a list of examinations and a statement concerning status of work required for current interval. Reference Tab C

11. Abstract of Conditions Noted Reference Tab B and Tab F

Certificate of Authorization No. (if applicable)

12. Abstrect of Corrective Measures Recommended and Taken Reference Tab B and Tab F

We certify that the statements made in this report are correct and the exeminations and corrective measures taken conform to the rules of the ASME Code, Section XI.

July 2, 19 90 Signed (Nisconsin Public Service Corp Mark P. March Date _

N/A Expiration Date

N/A

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessal Inspectors and/or the Stata or Province of <u>Wiscensin</u> and employed by <u>Hanfford Steam Briter</u> ler of _______ have inspected the components described in this Owners Data Report during the period <u>3-13-90</u> to <u>4-21-90</u>, and state that to the best of my knowledge and belief, the Owner has performed exeminations and taken corrective measures described in this Owners Data Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspactor nor his employer makes any warrenty, expressed or implied, concerning the examinations and corrective measures described in this Owners Date Report. Furthermora, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date July 2 19 90	
Rom Mitin	Commissions NB 7741 Wis 38
Inspectore Signature	National Bosrd, State, Province end No.

ATTACHMENT 2

1990 Inservice Examination Summary

July 13, 1990

Scope and Results of Examinations

WISCONSIN PUBLIC SERVICE CORPORATION KEWAUNEE UNIT NO.1 NUCLEAR POWER PLANT 3RD OUTAGE; 2ND PERIOD; 2ND INTERVAL 1990 EXAMINATION SUMMARY

INTRODUCTION

An Inservice Examination Program was performed at the Kewaunee Unit No.1 Nuclear Power Plant from March 13,1990 thru April 21,1990 by Westinghouse Electric Corporation Nuclear Service Division Inspection Services and Wisconsin Public Service Corporation-Kewaunee Unit No.1.

Examinations were performed to satisfy the requirements of:

- 1.ASME Boiler and Pressure Vessel Code Section XI 1980 Edition up to and including Winter 1981 Addenda.
- 2.ASME Boiler and Pressure Vessel Code Section XI 1986 Edition for IWF-2500-1 Examinations.
- 3.Nuclear Regulatory Bulletin 88-08.
- 4.Nuclear Regulatory Bulletin 89-02.

5.Nuclear Regulatory Commission Report NRC-07-01-87 and OEA-87-157.

The Examination Program Plan located under Tab C was prepared by Kewaunee Unit No.1 for the 3rd Outage,2nd Period,2nd Interval as identified in the 2nd Ten Year Plan (1984-1994)

The following items were examined (Reference Tab C):

1.Recator Vessel Studs

2.Steam Generators A and B

3.Class 1 and Class 2 Piping

4.Reactor Coolant Pump A

5.Class 1, 2 and 3 Valves

6.Class 2 Components

7.Class 1, 2 and 3 Piping and Component Supports and Hangers

8.Class 1, 2 and 3 System Leakage Tests

The examinations performed were in accordance with an approved Examination Program Plan located under Tab C of the Final Report.Examination Procedures were approved prior to the start of examinations and certification documents relative to personnel, equipment and materials were reviewed and determined to be satisfactory.

Witnessing and surviellance of the examinations and related activities were conducted by personnel from:Hartford Steam Boiler Inspection and Insurance Company and Wisconsin Public Service Corporation Quality Assurance Department.

RESULTS

Examinations resulted in the following recordable indications being noted on the basis of procedure recording criteria, which generally are more critical than specified ASME Boiler and Pressure Vessel Code Section XI Acceptance Standards.

- 1. Eight(8) Recordable Indications on drawings WPS-1-4102(M1145)-6WS(R-RHR-H3),WPS-1-4107(M1147)-14(RTD-W12S) and 16(RTD-W10S), WPS-1-4201(M1152)-2(SI-W76),WPS-1-4209(M1155)-19(RTD-W74S),WPS-1-4500(M1159)-7DM(RC-W67DM),WPS-1-4505(M1161)-4(PS-W32) and WPS-1-5100(M1204)-A-2SC(RCP-CS2) were noted by Surface Examinations on Class 1 Piping,Pumps and Welded Supports.These indications were dispositioned,accepted or repaired,reexamined and found to be acceptable.
- 2. Fourteen(14) Recordable Indications on drawings WPS-1-4101(M1145)-3WS & 3R(Restraint 100),WPS-1-4103(M1144)-8842A(SI-13A),WPS-1-4206 (M1154)-8843A(SI-303A) and 8844A(SI-304A),WPS-1-4209(M1155)-1SH (RTD-H12),WPS-1-4504(M1162)-13HS(RC-H29A),WPS-2-2100(M1165)-6R & 6WS(MS-H11),WPS_3-1200(M1217)-1A(ATBA-1A),WPS-3-1201(M1217)-1B (ATBA-1B),WPS-3-3852-1R(AC-H14),M1099-SI-2A and SI-2B,X-K100-21-CVC-300,X-K100-35-LD-4C and X-K100-59-SW901C were noted by Visual Examination on Class 1, 2 and 3 Piping Supports and Components and Class 1, 2 and 3 Valves.These indications were dispositioned,accepted or repaired,reexamined and found to be acceptable.
- 3.One Hundred Seventy Eight(178) Recordable Indications on drawings Kewaunee Unit No.1 Operations X-K100-10,X-K100-18,X-K100-20, X-K100-28,X-K100-35,X-K100-44,M202,M203,M205,M214,M217,M218,M219, M547 and M606 were noted by Visual Examination on Class 1, 2 and 3 Systems during Leakage Tests.Indications recorded were due to Leakage,Boric Acid,Residue Deposits and Rust or Corrosion on Valves and Piping.These indications were dispositioned,accepted or repaired,reexamined and found to be acceptable.

Specific data relative to the above indications and their dispositions are located under Tab F of Volume I of the Final Report.

Phillip E. Bukes

Shillip E. Bulks,Westinghouse MSD ESE Coordinat ?

ATTACHMENT 3

Owner's Letter of Disposition

1990 Inservice Inspection

July 13, 1990

OWNER'S LETTER OF DISPOSITION WISCONSION PUBLIC SERVICE CORPORATION KEWAUNEE NUCLEAR POWER PLANT 3rd Outage, 2nd Period, 2nd Interval 1990 Outage Core XV - XVI

During the 1990 refueling outage, Wisconsin Public Service Corporation and Westinghouse Electric Corporation personnel performed inservice inspections of selected components at the Kewaunee Nuclear Power Plant. These inspections resulted in the following indications being reported on the bases of ISI procedure recording criteria which is generally more restrictive than Section XI acceptance criteria:

- 1. Eight (8) Recordable Indications were noted by Surface Examinations on Class 1 Piping Pumps and Welded Supports;
- 2. Fourteen (14) Recordable Indications were noted by Visual Examination on Class 1, 2, and 3 Component Supports and Class 1, 2, and 3 Valves; and
- 3. One Hundred Seventy Eight (178) Recordable Indications were noted by Visual Examination on Class 1, 2, and 3 Systems during Leakage Tests.

All two hundred one (201) of these indications have been evaluated and dispositioned (accepted, repaired/replaced, or monitored). Of the two hundred one (201) indications only two (2) of them were evaluated by Wisconsin Public Service Corporation as exceeding the Table IWX-2500-1 acceptance criteria of Section XI.

The two (2) indications that exceeded the acceptance criteria of Section XI are a bent plate on a main steam stanchion and a linear tool mark observed on a 2 inch diameter reactor temperature detection pipe. Both of these conditions have been evaluated by Wisconsin Public Service Corporation and found to be acceptable for continued operation. In the future, as a precautionary measure, the bent plate will be removed from the stanchion. The tool mark will be reexamined in the future to verify the integrity of the pipe.

The recordable VT-2 indications were documented, investigated, and evaluated during the system pressure tests. Corrective actions, such as torquing flange studs/bolts, removing boric acid/corrosion, and repairing leaks of non-motor operated valves/flanges/components were performed in the field during the tests. Work requests were also initiated to correct minor packing leaks of motor operated valves and other components; this work will be performed during the future as plant operating conditions and schedule permit. All indications noted during these tests have been reviewed by the Plant Technical Group and required corrective actions have been performed when possible. Visual observations such as light boric acid, white or yellow residue, and insignificant leakage that does not compromise the integrity of the carbon/alloy steel fasteners have been dispositioned as acceptable by Wisconsin Public Service Corporation and will continue to be monitored as required through normal plant tours and inspections. In closing, Wisconsin Public Service Corporation acknowledges that all two hundred one (201) indications listed in the summary report located under Tab F of the 1990 Annual ISI Report have been dispositioned in accordance with the rules of Section XI and that the Authorized Nuclear Inservice Inspector has verified this activity.

Specific data relative to the above indications and their disposition, are located under Tab F of the Final Report.

Charles A Stones

Charles A. Tomes Plant Inservice Inspection Engineer Wisconsin Public Service Corporation Kewaunee Nuclear Power Plant

mark L. Mauli

Mark L. Marchi Plant Manager Wisconsin Public Service Corporation Kewaunee Nuclear Power Plant



ATTACHMENT 4

Steam Generator Tube

Eddy Current Inspection and

Mechanical Plugging Summary

July 13, 1990

CUSTOMER: SITE: PERIOD OF SERVICE: FIELD SERVICE REPORT:

Wisconsin Public Service Kewaunee Nuclear Power Plant March 7 through March 30, 1990 MRS 4.4.WPS-19 Eddy Current Inspection and Mechanical Plugging

During the Kewaunee Nuclear Plant (16th. refuel cycle) outage of March/April of 1990, the Steam Generator Primary Maintenance Service group of Nuclear Services Division performed the following services:

- 1. Video inspection of both the hot and cold leg tubesheets of Steam Generators "A" and "B".
- 2. Bobbin eddy current test of Steam Generators "A" and "B".
- 3. Rotating pancake test on a random sample of tubes in Steam Generators "A" and "B".
- 4. Cross-wound eddy current test of a random sample of sleeved tubes in Steam Generators "A" and "B".
- 5. Mechanical plugging in Steam Generators "A" and "B".

STEAM GENERATOR DESCRIPTION

The steam generators at KNPP are Westinghouse Model 51 series design with 3388 tubes manufactured from Mill Annealed Inconel 600 Alloy (MA600). The tubing in these steam generators measures 0.875" O.D. x 0.50" nominal wall thickness. The tubes are partial depth rolled from the tube mouth entrance to a distance of approximately 2.5 inches leaving a crevice depth of approximately 18.53 inches in the tubesheet. The tube support plates are approximately 3/4 inches thick and are made from carbon steel.

Prior to the March 1990 eddy current examination, 166 tubes (4.90%) were plugged and 1873 (55%) of hot leg tubes were sleeved in Steam Generator "A". In Steam Generator "B", 271 tubes (8.0%) were plugged and 1765 (52%) hot leg tubes were sleeved.

SCOPE OF INSPECTION

The chronology of the 1990 inspection was to inspect fifty-five (55%) of the tubes in each steam generator through their entire full length with bobbin coil, and 100% of all unsleeved tubes at least to the hot leg first tube support plate from the hot leg tube end. The full length sample included all previous indications in areas above the first hot leg support plate, all row one and peripheral tubes, randomly selected sleeved tubes from the cold leg to the top of sleeve on the hot leg (approximately 10% in each steam generator) and all remaining tubes which had not been inspected through their full length in the last four (4) years.

Steam Generator "A" Bobbin Test

Approximately 2,385 tubes (70%) were examined in this generator with the standard bobbin coil; Of the 2,385 tubes examined, 838 of the open tubes (unsleeved and unplugged) were tested full length, 1,038 of the 1876 sleeved tubes were tested full length (not including the sleeved section), from the cold leg tube end to the top of sleeve on the hot leg and 511 of the remaining unsleeved tubes (approximately 15 percent of the total tubes in this steam generator) were tested at least to the hot leg first tube support plate from the hot leg tube end. In addition, 204 sleeved tubes were inspected through the entire length of the sleeve using a 0.640" diameter cross-wound bobbin probe.

Steam Generator "A" Rotating Pancake Coil Test

Approximately 313 tubes were examined with a rotating pancake coil probe. Of the 313 tubes examined, 212 hot leg full crevices were examined (including top of tubesheet hot leg), 3 cold leg full crevices were examined, 37 hot leg tubesheet intersections were examined, 59 support plate intersections were examined 20 Row 1 and 20 Row 2 tubes were examined through the U-bend transition regions.

Steam Generator "B" Bobbin Test

Approximately 1,982 tubes (59%) were examined in this Steam Generator with the standard bobbin coil; Of the 1,982 tubes examined, 841 of the open tubes (unsleeved and unplugged) were tested full length, 1,017 of the 1765 sleeved tubes

were tested full length (not including the sleeved section) from the cold leg to the top of sleeve on the hot leg and 511 of the remaining unsleeved tubes (approximately 15 percent of the total tubes in each Steam Generator) were tested at least to the hot leg first tube support plate from the hot leg tube end. In addition, 202 sleeved tubes were inspected through the entire length of the sleeve using a 0.640" diameter cross-wound bobbin probe.

Thirty seven (37) of the 1,017 sleeved tubes scheduled for full length test (from the cold leg tube end to the top of the sleeve on the hot leg) were either restricted in the U-bend, or locations at or around the seventh and sixth tube support plates on the hot leg with 0.720, 0.700 or 0.680" diameter probes. Data on these tubes were collected from point of restriction with the 0.680" diameter probe for the U-bend region and with a 0.720" diameter probe for the cold leg straight section and the same tubes were also tested with 0.610" diameter probe to the point of restriction from the hot leg.

Steam Generator "B" Pancake Coil Test

Approximately 324 tubes were examined with a rotating pancake coil probe. Of the 324 tubes examined, 231 hot leg crevices were examined (including top of tubesheet hot leg), 23 tubes were examined at the hot leg tubesheet intersections, 68 support plate intersections were examined and 20 Row 1 and 20 Row 2 tubes were examined through the U-bend transition region.

SUMMARY OF INDICATIONS

Steam Generator "A"

- 49 tubes were reported as degraded tubes (exhibited 20% to 49% through wall loss).
- 29 tubes were reported as defective tubes (exhibited 50% to 100% through wall loss).
- 86 tubes were reported as having either a single axial or multiple axial indications or a combination of both.

Steam Generator "B"

- 80 tubes were reported as degraded tubes (exhibited 20% to 49% through wall loss).
- 13 tubes were reported as defective tubes (exhibited 50% to 100% through wall loss).
 - 102 tubes were reported as having a single axial or multiple axial indications or a combination of both.

Disposition of RPC Results

RPC was performed to clarify some of the unquantifiable bobbin calls. Positive indications shown by RPC isometric and clip plots helped classify the indications as either axial (single or multiple) or volumetric wall loss (pitting or generalized tube wall thinning). Those tubes with support plate or top of tubesheet RPC indications that indicated volumetric wall loss (Pitting or Thinning), were reported in the data base as distorted indications and left in service for further growth rate trend analysis.

EXAMINATION

The examination, equipment, and personnel were in compliance with the requirements of Westinghouse Nuclear Services Division procedure No. MRS 2.4.2 GEN-28 (Digital Multi-Frequency Eddy Current Inspection of Heat Exchanger Tubing) Rev. 3, Westinghouse Quality Assurance procedure No. QA 2.2 Rev. 5 (Training, Qualification, and Certification of Personnel in Nondestructive Testing), the ASME Boiler Pressure Vessel code, Section XI 1980 Edition through the Winter 1981 addenda, industry standards and the applicable Kewaunee Nuclear Power Plant technical specifications.

The steam generator tubing examinations were performed by technicians qualified to Level I and II and under the direct supervision of personnel qualified to Level III on both shifts in the data acquisition trailer. Westinghouse performed the primary analysis under the direct supervision of a Level III analyst and the secondary analysis was performed by Conam Inspection group. The analysis of the data was based on the Kewaunee site specific analysis guidelines.

Three different eddy current sensing elements where utilized. The following is a brief description of each test:

Bobbin Coil Test

The bobbin coil is the most commonly used probe during production examination because of its rapid inspection speed and high mechanical reliability. The coil windings are in a circumferential direction about the tube axis; hence, this probe arrangement provides an eddy current test that is most sensitive to volumetric (three dimensional) and linear tube wall discontinuities aligned parallel with the tube axis.

All of the unsleeved tubes in each steam generator were tested using either 0.720", 0.700" or 0.680" diameter probes or a combination of any of the three probes. Frequencies used were depicted in job specific configuration # WPS-01-901 of 400 KHz, 200 KHz, 100 KHz and 10 KHz in differential and absolute modes. Also used was another job specific configuration, # WPS-01-902 with test frequencies of 600 KHz, 400 KHz, 200 KHz, and 100 KHz in differential and absolute modes. This configuration was used only on three tubes selected for removal from the Steam Generator via the tube pull process.

All tube support plate indications and support residual signals were analyzed using 400/100 KHz differential mix with both the prime and intermediate frequencies (400 and 200 KHz) used for correlation. Either 400/100 KHz mix or 400 KHz was used for the analysis of indications above the top of the tubesheet depending on whether the indication was influenced by the presence of deposits or not. Deposits are normally observed at a low frequency channel (i.e. 100 Khz).

The inspection was performed at a probe pusher pull speed of 12 inches per second utilizing the Miz-18A digital eddy-current inspection system with a sampling rate of 400 data points per second.

Rotating Pancake Coil Test

The rotating pancake coil test (RPC), was performed as a supplement to the bobbin test during this period. The rotating pancake coil probe is essentially a probe in which a pancake coil is wound and mounted perpendicular to the inside tube surface as to induce a current in the tube parallel to the tube surface. This coil is also springloaded to suppress lift-off effects. This coil is sensitive to both axially and circumferentially oriented flaws as opposed to the differential bobbin probe which is most sensitive to axially oriented flaws and least sensitive to circumferentially oriented flaws.

The RPC probe was used to quantify some of the ambiguous bobbin calls such as distorted roll transition signals in the tubesheet, distorted tubesheet signals and distorted support plate signals due to structure residual signals on the mixed channel. The RPC probe is also sensitive to volumetric wall loss associated with generalized wall thinning and pitting.

For the straight length RPC test, 400, 300, 200 and 100 KHz frequencies were applied to a 0.720" diameter probe with a translation speed of 0.2 inches per second on a motor driven unit at 300 revolutions per minute. The digitized raw data was sampled at 400 data points per second.

The U-bend RPC was performed to detect the presence of U-bend cracking associated with the stressed areas of the low rows tubes. Test frequencies for this inspection using 0.680" diameter RPC probes were 400, 300, 150 and 750 KHz with probe translation pull speed of 0.1 inches per second on a motor driven unit with a rotation speed of 180 revolutions per minute. The digitized raw data was sampled at 400 data points per second.

Double Crosswound Coil Test

This probe is essentially a special case of bobbin coil arrangement with two bobbin coil sets. Each bobbin coil set is "crossed" to eliminate symmetric 360 degree geometric changes i.e. tube rolls and expansions. One coil set is rotated 90 degrees to the other coil set to "cover" the dead spot in the coil set that exist where the windings crossed.

This probe is predominantly used on sleeves to minimize the signal affects caused by hydraulic expansion and hard-rolling. This examination was performed using 730, 400, 150 and 50 KHz in the differential mode. The 730 KHz and 50 KHz were used for flaw detection in the sleeve and parent tube. The inspection was performed at a probe pusher pull speed of 12 inches per second utilizing the digital acquisition unit with a sampling rate of 400 data points per second.

MECHANICAL TUBE PLUGGING

Mechanical tube plugging was performed using Westinghouse Inconel 690 tapered plugs. The basis for the tube plugging was to remove tubes from service as a result of eddy current pluggable indications and to preventively plug around a tube remnant left in the steam generator after the tube pull effort. Below is a breakdown of the number of tubes

	S	<u>G-A</u>	<u>S(</u>	<u>G-B</u>
Basis for Tube Plugging	<u>Corrective</u>	<u>Preventive</u>	Corrective	Preventive
Hot leg crevice	68	15	54	31
Hot leg top of tubesheet	7	0	10	0
Hot leg support plates	15	9	6	0
Cold leg support plates	7	1	5	0
Preventative plugging				
around pulled tube (R4C81)	. 0	0	0	3
Total	97	25	75	34

RADIATION EXPOSURE REPORT

The total radiation exposure for the base scope eddy current was 5.944 Rem. The expanded eddy current scope resulted in additional 1.404 Rem. Mechanical tube plugging was 0.068 Rem. The total exposure for eddy current and mechanical tube plugging was 7.417 man-rem. This is well below the estimated 22.00 man-rem for the scope of work.

The impressive radiation results could be credited to channel head decontamination, the high reliability of the Westinghouse WL-2 robotics, and the high skill level of Westinghouse personnel and their knowledge of Alara practices.

GENERAL

For the detailed results of the eddy current tests, listings and maps of tubes plugged, refer to the appropriate appendices of this text. All other process data sheets, certification documents, equipment and material quality release can be found in the appropriate appendix of this text.

The services provided as depicted in this report meets the contractual requirements of Wisconsin Public Service Corporation purchase order No. 77363 and Westinghouse general order No. MK76451 and as amended by proposal No. 8940391.

Prepared By

D. J. Obazenu Field Service Engineer S/G Primary Inspection Services

on 7 D. San filo Approved By F. D. Garofalo, Manager

S/G Primary Inspection Services

Approved By

J. S. Olszewski, Manager Steam Generator Services

Approved By

C. A. Meyers, Manager Operations QA

ATTACHMENT 5

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Licensee Event Report

July 13, 1990

Kewaunee Nuclear Power Plant Reportable Occurrence 90-005-00 WPSC (414) 433-1598 TELECOPIER (414) 433-5544



NRC-90-54

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WISCONSIN PUBLIC SERVICE CORPORATION

600 North Adams • P 0. 8ox 19002 • Green 8ay, WI 54307-3002

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May 4, 1990

10 CFR 50.73

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

Gentlemen:

Docket 50-305 Operating License DPR-43 Kewaunee Nuclear Power Plant Reportable Occurrence 90-005-00

The attached Licensee Event Report for reportable occurrence 90-005-00 is being submitted in accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System."

Sincerely,

· ole

K. H. Evers Manager-Nuclear Power

PMF/jms

Attach.

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cc - INPO Records Center Mr. Patrick Castleman, US NRC US NRC, Region III NRC Form 366 (9-83)

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LICENSEE EVENT REPORT (LER)

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Description of the Event

At 1810, on April 4, 1990, with the plant in refueling shutdown, the inspection and plugging of the steam generator [SG] tubes [TRB] were completed for the 1990 refueling outage.

The SG tube eddy current inspection program included:

- an inspection of all the unplugged and non-repaired tubes from the hot leg side through the first tube support plate on the hot leg side (2701 tubes),
- an inspection of 62.2% of the unplugged, non-repaired tubes through their entire length (1679 tubes),
- 3. an inspection of 56.5% of the unplugged repaired tubes through their entire length (2055 tubes).

In addition, selected tubes (including samples of degraded tubes, defective tubes, no detectable degradation (NDD) tubes, and Row 1 U-bend tubes) were inspected using a motorized rotating pancake coil (MRPC). The MRPC inspection was implemented in an effort to characterize tube degradation and to supplement the bobbin coil probe inspection results. The MRPC inspection found indications in the hot leg crevice region in tubes that had been identified as NDD tubes by bobbin coil. The results of the MRPC inspection were presented to the NRC in references 1 and 2.

The Kewaunee Nuclear Power Plant Technical Specification (KNPP TS) 4.2.b.2.a requires that the initial inspection include at least 3% of the non-repaired tubes and at least 3% of the repaired tubes in each SG from the point of entry around the U-bend to the top support plate on the opposite leg. Since this year's inspection program resulted in approximately 62% of the non-repaired tubes and 56% of the repaired tubes being inspected through their entire length (see items 2 and 3 above) the program satisfies the TS requirements.

The inspection found that 7.2% of the inspected tubes in steam generator A (97 tubes) and 5.5% of the inspected tubes in steam generator B (75 tubes) met the KNPP TS definition of defective. The steam generators at Kewaunee are Westinghouse model 51 with mill annealed inconel 600 tubes. Since greater than 1 percent of the inspected tubes in the hot leg crevice area in each steam generator were found to be defective, both steam generators were categorized as C-3. The C-3 category requires:

1. prompt notification of the Nuclear Regulatory Commission (NRC),

2. a written followup to the NRC,

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- 3. plugging or repair of all defective tubes,
- 4. an inspection of additional tubes in the affected areas if the initial sample size is less than 100% in the affected area.
- 5. increasing the required steam generator inspection frequency to once per 20 months.

When SG A was categorized as C-3, the NRC was notified at 1900 on March 17, 1990 via the emergency notification system (ENS) telephone. When SG B was categorized as C-3, the NRC was notified via the ENS telephone at 1700 on March 28, 1990. Both notifications were made within 4 hours of categorizing the SG as C-3. This licensee event report is supplied as the written followup to the initial notifications. As described later in this report, all defective tubes were plugged. Since all the unplugged non-repaired tubes were inspected to the first support plate, the additional inspection requirements specified by Table TS 4.2-2 were satisfied. The steam generators will be re-inspected in the Spring of 1991 during Kewaunee's annual refueling outage.

The steam generator tube inspection and plugging results for the 1990 refueling outage are summarized in the following tables.

SG	No. of Defective Tubes	No. of Defective Tubes Plugged	No. of Tubes Plugged as a Preventive Measure	No. of Defective Tubes Removed for Analysis
А	97	97	25	0
В	75	75	34	2

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The defects in SG A were loca	ted in the following a	reas:	·	
Area	Number of Tubes	Perc	ent	
Hot Leg Crevice	6 8	70.	1%	
Top of Tubesheet- Hot Leg Side	7	7.	2%	
Hot Leg Support Plates	15	15.	5%	
Cold Leg Support Plates	7	7.	2%	
TOTAL	97	10	0%	
The defects in SG B were locat	ed in the following a	reas:		
Area	Number of Tubes	Perc	ent	
Hot Leg Crevice	54	72	2%	
Top of Tubesheet- Hot Leg Side	10	13.	3%	
Hot Leg Support Plates	6	٤	3%	
Cold Leg Support Plates	5	6.7	2%	
TOTAL	75	100)%	

The majority of the steam generator tube degradation at Kewaunee is assumed to be caused by intergranular attack and outside diameter intergranular stress corrosion cracking (IGA/IGSCC). This assumption is based on eddy current response and on industry experience with steam generator tube degradation.

IGA/IGSCC is usually associated with a restricted geometry; e.g., the tube sheet crevice or a sludge pile, and with a caustic environment; i.e., a pH greater than 10.

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Analysis of Event

This report is supplied in accordance with TS 4.2.5.a and TS 4.2.5.c which require a written report to be submitted to the NRC within 30 days of completing the steam generator tube repair and plugging.

The following table provides a historical summary of the number of SG tubes plugged each year.

SG	1983	1984	1985	198 6	1987	1988	1989	1 99 0	Total
A	23	9	26	26	44	27	21	122	298
В	50	17	22	46	79	26	31	109	380
									678

In addition to the plugged tubes, 3638 tubes were sleeved during previous outages, resulting in an equivalent plugging percent of 10.9% in SG A and 13.4% in SG B. A safety evaluation, including the transient and loss of coolant accident analyses presented in Kewaunee's Updated Safety Analysis Report (USAR), was performed assuming a plugging level of 13.9% per SG. This safety evaluation demonstrated that this level of plugging is bounded by Kewaunee's USAR; therefore, operation of the plant does not represent a significant hazard to the health and safety of the public.

Corrective Actions

In accordance with Kewaunee's Technical Specifications, all defective tubes were plugged. In order to minimize the possibility of primary to secondary leakage during the 1990-91 operating cycle, fifty-nine other tubes were also plugged as a preventive measure.

Sludge lancing and crevice flushing were conducted during this refueling outage to reduce the amount of sludge and to remove contaminants from the tube sheet crevice. Also, in an effort to reduce the caustic environment in the tube crevice and prevent tube support plate denting a secondary system boric acid addition program has been implemented including boric acid soaks at low power levels and on line boric acid addition at normal power levels. A secondary side annular search was also conducted to identify and remove foreign objects, which could damage the SG tubes.

In order to further characterize the indications, portions of two defective tubes were removed from SG B for laboratory analysis.

Model 10 Identify available in the standard in t	, rok <i>m ,≣∎6A</i> 31	LIC	CENSEE EVENT REPO	ORT (LER) TEXT CONTINU	JATION	NUCLEAR REGULATORY COMMIS APPROVED OM8 NO 3150-0104 Expines 8/31 85
Kewaunee Nuclear Power Plant Interpretation Interpretation Additional Information Equipment Failure: Westinghouse Model 51 steam generator tubes. The tubing is mill annealed incomel 600. Similar Events: 1. LER 89-007, Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 2. LER 89-003, Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 3. Letter from D.C. Hintz (WPSC) to the U.S. NRC Document Control Desk, dated March 31, 1987. 4. Letter from D.C. Hintz (WPSC) to G.E. Lear (NRC) dated April 23, 1986. 5. LER 85-06. 6. Letter from C.W. Giesler (WPSC) to S.A. Varga (NRC) dated May 1, 1984. References: 1. Letter from C.W. Giesler (WPSC) to the US NRC Document Control Desk dated April 6, 1990. 2. Westinghouse WCAP 12558 "Kewaunee Tube Sheet Crevice Indications Return to Power"	ILITY NAME (1)	· · · ·		DOCKET NUMBER (2)	LER NUMBER IS	1 PACE (3)
Kewaunee Nuclear Power Plant o solo 300 and 3					YEAR SEQUENTIAL	REVISION
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 Additional Information Equipment Failure: Westinghouse Model 51 Steam generator tubes. The tubing is mill annealed inconel 600. Similar Events: 1. LER 89-007. Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 2. LER 88-003. Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 3. Letter from D.C. Hintz (WPSC) to the U.S. NRC Document Control Desk, dated March 31, 1987. 4. Letter from D.C. Hintz (WPSC) to G.E. Lear (NRC) dated April 23, 1986. 5. LER 85-06. 6. Letter from C.W. Glesler (WPSC) to S.A. Varga (NRC) dated May 1, 1984. References: 1. Letter from K.H. Evers (WPSC) to the US NRC Document Control Desk dated April 6, 1990. 2. Westinghouse WCAP 12558 "Kewaunee Tube Sheet Crevice Indications Return to Power" 				0 5 0 0 3 0 5	90 - 0015	
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 Equipment Failure: Westinghouse Model 51 steam generator tubes. The tubing is mill annealed incomel 600. Similar Events: 1. LER 89-007, Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 2. LER 88-003, Intergranular Attack and Intergranular Stress Corrosion Cracking Result in Defective Steam Generator Tubes 3. Letter from D.C. Hintz (WPSC) to the U.S. NRC Document Control Desk, dated March 31, 1987. 4. Letter from D.C. Hintz (WPSC) to G.E. Lear (NRC) dated April 23, 1986. 5. LER 85-06. 6. Letter from C.W. Giesler (WPSC) to S.A. Varga (NRC) dated May 1, 1984. References: 1. Letter from K.H. Evers (WPSC) to the US NRC Document Control Desk dated April 6, 1990. 2. Westinghouse WCAP 12558 "Kewaunee Tube Sheet Crevice Indications Return to Power" 	Additional I	Inform	ation			
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 Letter from K.H. Evers (WPSC) to the US NRC Document Control Desk dated April 6, 1990. Westinghouse WCAP 12558 "Kewaunee Tube Sheet Crevice Indications Return to Power" 			6. Letter from C May 1, 1984.	.W. Giesler (WPSC) t	o S.A. Varga ((NRC) dated
2. Westinghouse WCAP 12558 "Kewaunee Tube Sheet Crevice Indications Return to Power"	References:	1. [Letter from K.H. Desk dated April	Evers (WPSC) to the 6, 1990.	US NRC Documer	it Control
		2.	Westinghouse WCAP Indications Return	12558 "Kewaunee Tub n to Power"	e Sheet Crevic	e
			· .			
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ATTACHMENT 6

Welded Repair Records

(Form SB-190)

July 13, 1990

State of WisconsinW E L D EDepartment of Industry, Labor and Human RelationsR E	D R E P A I RSafety & Buildings DivP.O. Box 7969C O R DMadison, Wiscosnin 537
·	Telephone: (608) 266-1
Repair completed on:	Wisconsin Reg. No:
🗌 Power Boiler 🛛 Heating Boiler	National Board No:
Pressure Vessel Miniature Boiler,	Serial No:
fanufacturer:	Other No: Power Piping
WORK COMPLETED BY:	TN THE DIANT OF
Name:	Owner's Name:
Wisconsin Public Service Corporation	Wisconsin Public Service Com-
Street Address	Location of Papaine
600 N. Adams P.O. Boy 10002	Revenue Nuclear Dans Di
City/Town/Village. 7in Code:	Newaunee Nuclear Fower Plant
Green Bay, WI 54307-9002	<u>N 490, Highway 42</u>
Description of Repair - attach additional n	<u>Kewaunee, WI 54716-9510</u>
Per Work Request 45750 installed on r	einforcing pad on 6" Safety Injection
Pump TA Succion.	
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indrostatic Test DST	
Repair made in accordance with the require	NDL VT and 100% LPT Final Weld.
Labor and Human Relations, Wisconsin Admin	nistrative Code Chapters 41-42.
The welding was completed by	r = -355 - 40 - 1385
requirements of Chapters 41-42.	, R 595-74-4780 , who has met the test
elding procedure specification:WPS GM	P 102-388 TGS
A	
Contractor rep. signature: COQ	Deted. 7 (Oc
Contractor rep. signature: <u>AMupho</u>	Dated: 7-6-90
I, the undersigned, have inspected the wor	Dated: 7-6-90 rk described in this report and state that the
I, the undersigned, have inspected the work, to the best of my knowledge and belt	Dated: 7-6-90 rk described in this report and state that the ief. has been done in accordance with the
I, the undersigned, have inspected the work work, to the best of my knowledge and belt requirements of Wis. Adm. Code Chapters T	Dated: <u>7-6-90</u> rk described in this report and state that the ief, has been done in accordance with the LHB 41-42. By signing this certificate
I, the undersigned, have inspected the work work, to the best of my knowledge and belt requirements of Wis. Adm. Code Chapters II the inspector nor his employer makes any	Dated: <u>7-6-90</u> rk described in this report and state that the ief, has been done in accordance with the LHR 41-42. By signing this certificate, neither warranty, expressed on implied
I, the undersigned, have inspected the work work, to the best of my knowledge and belt requirements of Wis. Adm. Code Chapters II the inspector nor his employer makes any work described in this report. Furthermore	Dated: 7-6-90 rk described in this report and state that the ief, has been done in accordance with the LHR 41-42. By signing this certificate, neither warranty, expressed or implied, concerning the
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I, the undersigned, have inspected the work work, to the best of my knowledge and belt requirements of Wis. Adm. Code Chapters II the inspector nor his employer makes any w work described in this report. Furthermore shall be liable in any manner for any pers kind arising from or connected with this liability that may be provided in an insur company may issue for the object, and ther	Dated: 7-6-90 rk described in this report and state that the ief, has been done in accordance with the LHR 41-42. By signing this certificate, neither warranty, expressed or implied, concerning the e, neither the inspector nor his/her employer sonal injury or property damage or a loss of a inspection. The only exception is for such rance policy which the inspector's insurance n only in accordance with terms of that policy
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State of Wisconsin WELDED Department of Industry, Labor and Human Relations REC	R E P A I R O R D	Safety & Buildings Divisi P.O. Box 7969 Madison, Wiscosnin 53707 Telephone: (608) 266-1904
Repair completed on:	Wisconsin Reg. No:	
Power Boiler Heating Boiler	National Board No:	
Pressure Vessel Miniature Boiler ,	Serial No:	
Manufacturer:	Other No:	Power Piping
WORK COMPLETED BY:	ти ти	IF PLANT OF.
Name:	Owner's Name:	
Wisconsin Public Service Corporation	Wisconsin Public S	ervice Corn
Street Address	Location of Renair.	Jerree outpr
600 N. Adams P.O. Box 19002	Revaunes Nucles L	OWER Diant
City/Town/Village: Zin Code:	Tradudee MUCICAL I	Wel ITaul
Green Bay, WI 54307-9002 Repair Program No:	<u>N 490, Highway 42</u>	
Description of Repair - attach additional page	<u>L Rewaunee, WI</u>	54716-9510
(use reverse side of this page for sketch)	II needed:	
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Hydrostatic Test PSI <u>1200</u> Repair made in accordance with the requirement Labor and Human Relations, Wisconsin Administ JBA - Barbeau, The welding was completed by JRF - Fessler, requirements of Chapters 41-42. RVK - Kosky, R RP - Pagel, A Welding procedure specification: when completed	NDE <u>VT and all weld</u> nts of the Wisconsin trative Code Chapter J - 398-52-0602 J - 388-58-9971 - 395-74-4760 - 393-32-2502	ds were MT or LPT'd. Department of Industry, s 41-42. ,who has met the test
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Labor and Human Relations	RECORD REPAIR Safety & Buildings Divi P.O. Box 7969 RECORD Madison, Wiscosnin 5370
	Telephone: (608) 266-19
Repair completed on:	Wisconsin Reg. No:
🗌 Power Boiler 🗌 Heating	Boiler National Board No:
🗌 Pressure Vessel 🔲 Miniatur	re Boiler , Serial No:
Manufacturer:	Other No: Power Piping
WORK COMPLETED BY:	TN THE DIANT OF
Name:	Owner's Name.
Wisconsin Public Service Corpor:	ation Wisconsin Public Service Corp.
Street Address	Location of Repair:
600 N. Adams P.O. Box	19002 Kewaunee Nuclear Power Plant
City/Town/Village:	Zip Code:
Green Bay, WI 54307-900 Repair Program No:	02 <u>N 490, Highway 42</u>
N/A	* Kewaunee UT 5/216-0510
Description of Repair - attach ad	dditional page if needed:
(use reverse side of this page)	for sketch)
Per Work Request 46091 inc	tollod a mainfamaing weak of the state of the
<u>ret_work_Request_40091_1115</u>	Larrey a reinforcing bad on 6" Safety Injection
Dump 18 Suction Line	, , , , , , , , , , , , , , , , , , ,
Fumb TB Succion Line.	
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Hydrostatic Test PSI	24 NDE VT and 100% LPT Final Wold
Hydrostatic Test PSI Repair made in accordance with	24 NDE VT and 100% LPT Final Weld.
Hydrostatic Test PSI Repair made in accordance with Labor and Human Relations. Wise	24 NDE <u>VT and 100% LPT Final Weld.</u> the requirements of the Wisconsin Department of Industr consin Administrative Code Chapters 41-42
Hydrostatic Test PSI Repair made in accordance with Labor and Human Relations, Wisc	24 NDE VT and 100% LPT Final Weld. the requirements of the Wisconsin Department of Industry consin Administrative Code Chapters 41-42.
Hydrostatic Test PSI Repair made in accordance with Labor and Human Relations, Wisc The welding was completed by	NDE <u>VT and 100% LPT Final Weld.</u> the requirements of the Wisconsin Department of Industry consin Administrative Code Chapters 41-42.
Hydrostatic Test PSI Repair made in accordance with Labor and Human Relations, Wisc The welding was completed by <u>Purequirements</u> of Chapters 41-42	24 NDE VT and 100% LPT Final Weld. the requirements of the Wisconsin Department of Industry consin Administrative Code Chapters 41-42. GH - Hirst, P 395-46-1389 ,who has met the test
Hydrostatic Test PSI Repair made in accordance with Labor and Human Relations, Wisc The welding was completed by <u>pr</u> requirements of Chapters 41-42.	24 NDE VT and 100% LPT Final Weld. the requirements of the Wisconsin Department of Industry consin Administrative Code Chapters 41-42. GH - Hirst, P 395-46-1389, who has met the test
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Labor and Human Relations R E C O R D P.0. Box (PS) Madison, Wisconin 53 Telephone: (608) 266. Repair completed on:	State of Wisconsin WELDEI Department of Industry	D R E P A I R Safety & Buildings Div
Repair completed on: Wisconsin Reg. No: Pressure Vessel Miniature Boiler Manufacturer: Other No: Wanufacturer: Other No: WORK COMPLETED BY: Other No: Wisconsin Public Service Corporation Wisconsin Public Service Corp. Streat Address Other No: Clty/Town/Village: 210 Code: Green Bay, WI S4307-9002 Repair Program No: MAA Repair Program No: Keaumee WI Screen Bay, WI S4307-9002 N 400. Highway 42 Keaumee, WI Bescription of Repair - attach additional page if needed: (use reverse side of this page for sketch) Per Work Request 46746 installed flangee, orifices, and root valve downstream of RHR 6A and RHR 6B.	Labor and Human Relations R E (C O R D Madison, Wiscosnin 537 Telephone: (608) 266-1
□ Power Boiler □ Heating Boiler National Board No: □ Pressure Vessel □ Miniature Boiler , Serial No: Manufacturer: Other No: Power Piping □ Mame: WORK COMPLETED BY: Th THE Plant OF: Name: Wisconsin Public Service Corporation Wisconsin Public Service Corp. Street Address P.O. Box 19002 Keaunee Nuclear Power Plant City/Town/Village: Zip Gode: Keaunee Nuclear Power Plant Cool N. Adams P.O. Box 19002 Keaunee Nuclear Power Plant City/Town/Village: SA307-9002 NA90. Highwar 42 Repair Program No: MA. Keaunee Muclear Power Plant Coverstrain of Repair - attach additional page if needed: Keaunee Muclear Power Plant (use reverse side of this page for sketch)	Repair completed on:	Wisconsin Reg. No:
Pressure Vessel Miniature Boiler , Serial No: Manufacturer: Other No: Power Piping Wame: Work COMPLETED BY: In THE PLANT OF: Name: Wisconsin Public Service Corporation Wisconsin Public Service Corp. Street Adress Owner's Name: Wisconsin Public Service Corp. Color. Adams P.O. Box 19002 Kewaunce Nuclear Power Plant City/Town/Village: 54307-9002 N 490. Highway 42 Repair Program No: Kewaunce, UT 54216-9510 Description of Repair - attach additional page if needed: (use reverse side of this page for sketch) Per Work Request 46746 installed flanges, orifices, and root valve downstream of RHR 6A and RHR 6B. "A Train - 750 PSIG NDE VT. LET all weids and RT 8" weids. Repair made in accordance with the requirements of the Misconsin Depairtment of Indust Labor and Ruma Relations, Wisconsin Administrative Code Chapters 41-42. The welding was completed by PGH - Hirst, P 395-46-1389 Welding procedure specification: WPS GMP 102-388 TGS Contractor rep. signature: QPG - Mirstry, expressed or implied, concerning V work, described in this report. Purthermore, mither the inspector nor his/her suployer shallist, the inspector nor his/her suployer suchamer suppre	Power Boiler Heating Boiler	National Board No:
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Welding procedure specification: WPS GMP 102-388 TGS Contractor rep. signature: <u>RPG_mm_</u> Dated: <u>7-6-90</u> I, the undersigned, have inspected the work described in this report and state that the work, to the best of my knowledge and belief, has been done in accordance with the requirements of Wis. Adm. Code Chapters ILHR 41-42. By signing this certificate, neith the inspector nor his employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of kind arising from or connected with this inspection. The only exception is for such liability that may be provided in an insurance policy which the inspector's insurance <u>company may issue for the object, and then only in accordance with terms of that poli-</u> Authorized Inspector Signature: Cert. No: Employed By: <u>Mary Mary 38</u> <u>Mary Mary Scam Baile</u> 7-9-9 SB-190(R.01/87)	Hydrostatic Test PSI * Repair made in accordance with the requirem Labor and Human Relations, Wisconsin Admini PGH - Hirst The welding was completed by RM - Rohr, requirements of Chapters 41-42. AHB - Bero.	NDE <u>VT, LPT all welds and RT 8" welds</u> ments of the Wisconsin Department of Industr Istrative Code Chapters 41-42. , P 395-46-1389 <u>M 398-42-2490</u> , who has met the tes A 392-40-7930
Contractor rep. signature: <u>RPR.</u> Dated: <u>7-6-90</u> I, the undersigned, have inspected the work described in this report and state that the work, to the best of my knowledge and belief, has been done in accordance with the requirements of Wis. Adm. Code Chapters ILHR 41-42. By signing this certificate, neith the inspector nor his employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of kind arising from or connected with this inspection. The only exception is for such liability that may be provided in an insurance policy which the inspector's insurance company may issue for the object, and then only in accordance with terms of that poli- Authorized Inspector Signature: Cert. No: Employed By: May May 38 Hartford Earn Baile 7-9-9 SE-190(R.01/87)	Welding procedure specification: WPS GMP	102-388 TGS
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