

ATTACHMENT TO LICENSEE EVENT REPORT NO. 82-017/01T-1

Wisconsin Electric Power Company
Point Beach Nuclear Plant, Unit 1
Docket No. 50-266

On October 22, 1982, Unit 1 was shut down for its tenth refueling outage. The 2000 psid primary-to-secondary hydrostatic test condition was established during cooldown of the unit. An 800 psid secondary-to-primary leakage check was performed on both steam generators on October 26, 1982. The 800 psid secondary-to-primary leakage check was performed visually with the aid of remote video equipment. The specific conditions identified during the leakage checks are noted below. (All noted leaks were observed from previously plugged tubes.)

"A" Steam Generator

Hot Leg

R 3C 9	Boric acid coated
R12C25	Boric acid coated
R14C57	2.0 drops per minute
R31C31	1.5 drops per minute

"B" Steam Generator

Hot Leg

R13C63	2.0 drops per minute
R28C43	Wet end
R29C34	Boric acid coated
R29C37	Boric acid coated
R31C44	Wet end

The eddy current inspection program, performed this outage, consisted of the following:

1. Inspection of essentially all readily remotely accessible tubes to the first support plate in the hot legs of both steam generators.
2. Inspection over the U-bend from the hot leg side of the greater than 3% of the tubes in each steam generator.
3. Inspection up to the sixth support of the hot leg tubes containing sleeves.
4. A special inspection of all the sleeves in both the hot leg and cold leg.
5. Inspection of tube locations previously identified as containing degradation.

On October 30, 1982, verification of all initial steam generator eddy current data for tubes with indications exceeding the plugging limit was completed. Four tubes in the "A" steam generator and three tubes in the "B" steam generator were verified to have degradation greater than 40%, which is the plugging limit of Technical Specification 15.6.2.A.5.

Of the 2,809 open tubes in the "A" steam generator, 2,769 were inspected and 2,787 of the 2,837 open tubes in the "B" steam generator were inspected. The tubes that were not inspected are as follows:

<u>Number of Tubes Not Inspected</u>		<u>Reason for Not Inspecting</u>
<u>"A"</u>	<u>"B"</u>	
19	16	Contained template plugs
1	-	Restricted tube ends
<u>20</u>	<u>34</u>	Under fixture "foot"
40	50	

These tubes were not inspected because of the radiation exposure associated with moving template plugs, moving eddy current equipment, and the reworking of a restricted tube end. The noninspected tubes constitute less than 2% of the unplugged tubes, most are not located in the zones where large numbers of defects have occurred, and the overall eddy current results did not indicate the necessity to inspect the tubes. Following is a summary of the eddy current indications and comparisons with the data from the three previous eddy current inspections. A blank entry under the results of previous eddy current inspections in the following table indicates that the tape for that specific inspection was not examined for this comparison.

"A" Steam Generator

<u>Tube</u>	<u>Defect</u>	<u>Location</u>	<u>Hot Leg</u>		
			<u>03/82</u>	<u>10/81</u>	<u>07/81</u>
R13C48	89%	21" ATE	89% NC	NDD	
R21C48	91%	20" ATE	90% NC	NDD	
R19C56	83%	21" ATE	73%-C-DS	75-C-DS	NDD
R27C58	80%	9&11" ATE	NDD		
R36C29	24%	TTS			
R 5C68	<20%	1/2" ATS			
R 5C69	<20%	1/2" ATS			
R 6C81	<20%	1" ATS			

Cold Leg

<u>Tube</u>	<u>Defect</u>	<u>Location</u>	<u>03/82</u>	<u>10/81</u>	<u>07/81</u>
R26C53	34%	2" ATS			
R20C60	<20%	5" ATS			
R28C48	36%	2" ATS			

"B" Steam Generator

Hot Leg

<u>Tube</u>	<u>Defect</u>	<u>Location</u>	<u>03/82</u>	<u>10/81</u>	<u>07/81</u>
R27C30	<20%	1" ATS			
R21C59	56%	8" ATE	NDD		
R20C61	80%	20" ATE	NDD		
R18C68	69%	20" ATE	73%-NC	UDI	UDI

ATE - Above tube end
NDD - No defect detected
UDI - Undefinable indication
ATS - Above tubesheet
TTS - Top of tubesheet
NC - No change
C - Change
DS - Distorted signal

Four tubes in the "A" steam generator and three in the "B" steam generator contained indications exceeding the 40% plugging limit. Of the seven indications exceeding the plugging limit, one is a new indication in the "A" steam generator and two are new indications in the "B" steam generator. The other indications identified were either previously noted as undefinable indications or defects that previously existed, but were not identified in prior inspections. As in the past, all indications were small volume and originated on the tube's outside diameter.

The seven tubes containing indications greater than the plugging limit have been mechanically plugged. Correct plugging was independently verified by visual means.

In addition, the eddy current inspection program identified a total, for both steam generators, of 71 tubes that are restricted to a 0.720" diameter probe at the first support plate on the hot leg side. Of the 71 restrictions, 20 are in the "A" steam generator and 51 are in the "B" steam generator. The majority of these restrictions are located in the periphery tubes near the "wedge" areas.

All of the restrictions, except for the two in the "B" steam generator, passed a 0.650" diameter probe. The two restrictions noted above passed a 0.610" diameter probe. Thirteen of the twenty restrictions in the "A" steam generator were present during previous inspections. Forty-two of the fifty-one restrictions in the "B" steam generator were present during previous inspections. In addition to a slight increase in the total number of restrictions, a slight increase in the extent of the restrictions in some of the tubes previously noted as containing restrictions was experienced.

All tubes restricted to a 0.700" probe at the first support were probed through the sixth support with a 0.650" or 0.610" probe. Only minor denting was noted at the higher supports.

The explosive plugs that were identified to be leaking at a very low rate (approximately two drops per minute) will not be weld repaired this outage. This decision is based on personnel radiation exposure associated with performing weld repairs, the low primary-to-secondary leak rate (less than ten gallons per day) prior to the outage, and the planned steam generator replacement scheduled in 1983.

An eddy current exam of 11 (Note: one sleeved tube was removed from service in 03/82) tubes sleeved during the 10/81 refueling outage was also performed this outage. An eddy current signal was identified in the hot leg sleeve in tube R28C58. This signal was believed to be an indication of a deposit on the ID of the sleeve wall. Evaluations of this signal included reprobng of this sleeved tube before and after brushing and honing of the sleeve wall.

A decision was made to remove the sleeve from this tube for further examination of this indication. The bottom 19-7/8" section of the sleeve was removed for laboratory non-destructive and destructive examination. The hot leg and cold leg ends of tube R28C58 were subsequently mechanically plugged.

Laboratory eddy current inspection confirmed the indication at 10.5" and studies with a pancake probe showed the indication was on the ID and more pronounced in 0-90-180° circumferential location. A detailed examination of the OD at up to 60X at this location and OD diametral measurements identified no cause for the indication and showed a constant OD value of 0.740".

Double wall x-ray radiographs were done at 0°, 45°, 90°, and 135°. Only a shallow circumferential mark at 10.5" was detected at 45°, 90°, and 135°. The mark was not found at 0°.

To facilitate further examination a tube section extending from 9 to 12" was removed and split longitudinally along 0° and 180°. At 10.5", a shallow circumferential mark was observed and found to be more pronounced at 0°-90°-180°. Wall thickness measurements indicated no localized wall reduction at this location. In addition, the section was searched for localized ferromagnetism because of a possible contribution of a ferromagnetic material to the EC signal. No ferromagnetic phase was detected with the instrument used.

The sample was further reduced in size for studies with the scanning electron microscope with the energy dispersive x-ray spectrometer. The 9-12" tube section from 0-180° was cut transversely one half-inch below and above the 10.5" indication and longitudinally at 90°. A scanning electron microscope montage through the indication location shows scratches but otherwise appears featureless. The microstructures at the indication and away from the indication are similar and were as expected from the in-plant wire brushing and honing. The Inconel 600 matrix composition along with Si and Al were found. The latter may have come from the honing.

The above section from 10-11" and 0-90° was cut longitudinally at 45°. On the 0-45° section, energy dispersive x-ray spectrometer area analyses were made at 10.4-10.55" (EC indication) and at 10.6-10.9" (away from EC indication). The Inconel 600 matrix composition and Al plus Si were found in both areas.

Elemental mapping for Ni and Fe was done in the above areas as part of an evaluation of the variation in the concentration of elements that might contribute to magnetic permeability. The concentrations of each element in the two areas are similar.

Metallography was performed on the 45° surface of the 45-90° section at 10.5". The wall is uniform in thickness and the structure appears normal.

Additional analyses and examinations are planned as required. The results will be reported, if necessary, in an additional supplement to this LER.

The roll transition and brazed areas of the tube sleeves were also inspected using the same eddy current parameters as used during the baseline inspection of 10/81. The data resulting from this inspection was compared to the baseline data, and no noticeable changes in the eddy current signals were identified. In addition to the sleeve inspections, the hot leg tubes containing sleeves were inspected through the sixth support from the hot leg side. This inspection was performed with normal eddy current parameters and a 0.650" diameter probe. No indications were identified.

To minimize the rate of corrosion, the Unit 1 primary system will be returned to power at a reduced hot leg temperature of 557°F.

The NRC Resident Inspector has been notified of these findings. This event is reportable in accordance with Technical Specification 15.6.9.A.3 and is similar to others.