ATTACHMENT 1

MATERIAL FROM LICENSEE

RECEIVED AUGUST 31, 2004

AS ANNOTATED

STEAM GENERATOR INSPECTION SCOPE FOR 2004 REFUELING OUTAGE

CURRENT TUBE PLUGGING HISTORY:

- The steam generators that are currently in use at the Palisades Nuclear Plant, are replacement steam generators and were installed in the fall of 1990. The tube material is mill annealed Alloy 600 with a 0.75 inch outside diameter and a 0.042 inch tube wall thickness. Each steam generator has 8219 tubes.

- Prior to the installation of these steam generators CE advised Consumers Energy that the area around the center stay cylinder region was potentially susceptible to fretting wear at the bat wing locations. This region was preventatively plugged. A total of 308 tubes were preventatively plugged in Steam Generator A and 309 tubes were preventatively plugged in Steam Generator B. After initial service Steam Generator A was designated Steam Generator E-50A and Steam Generator B was designated Steam Generator E-50B.

- After eight cycles of operation, 57 additional tubes in Steam Generator E-50A have been plugged, for a total of 365 tubes plugged. After eight cycles of operation, 51 additional tubes in Steam Generator E-50B have been plugged, for a total of 360 tubes plugged. Steam Generator E-50A has 7854 active tubes with 4.44% of its tubes plugged. Steam Generator E-50B has 7859 active tubes with 4.38% of its tubes plugged.

ACTIVE DAMAGE MECHANISMS IN 2004 REFUELING OUTAGE:

- Tube wear at vertical straps, diagonal bars, and eggcrates in both SGs
- Axial PWSCC at small radius U-bends in SG E-50A
- Axial PWSCC at the hot leg expansion transition and expanded tubesheet region in SG E-50A
- Axial and Circumferential ODSCC at the hot leg expansion transition in both SGs
- Axial PWSCC at the tack roll expansion in non-expanded tubes

STEAM GENERATOR 2004 INSPECTION SCOPE:

- 50% full-length bobbin coil eddy current examination of the inservice tubes in both SG. This includes all indications less than 40% throughwall wear left inservice. Any tube last tested with bobbin at the 1998 and 1999 inspections not tested in 2001 or 2003. DSS calls from the 2001 and 2003 inspections. NQS calls from the 2001 and 2003 inspections between 07H and 07C in Rows 80 and higher
- 100% examination of the in-service tubes in the area of the hot leg top-of-tubesheet roll transition area in both SGs using the Plus Point coil. The inspection depth is +3 inches to -8 inches.
- Full length tubesheet region Plus Point exam of non-expanded tubes
- 100% examination of the in-service Rows 1-3 U-bends in E-50A and Row 1 & 2 U-bends in E-50B using Plus Point mid range coil. 100% Rows 1-3 U-bends in E-50A and Row 1 & 2 U-bends in E-50B using Plus Point high frequency coil for those tubes with noise values exceeding a critical value.

- 25% Plus Point coil exam of freespan dings/dents >5 volts between DBH and DBC in both SGs
- 100% Plus Point coil exam of freespan dings/dents >5 volts in both SGs in vertical straight sections
- Special Interest freespan RPC including
  - Confirmation of bobbin I-code signals
  - RPC testing of wear scars reported as >40%TW by bobbin
  - RPC testing of newly reported signals at structures (vertical straps, diagonal bars & eggcrate supports) to confirm degradation mechanism mode
  - RPC testing through the square bend region of tubes surrounding R66 C140 in SG E-50B
  - RPC "boxing" of confirmed foreign object wear signals at all elevations
  - Outer 2 rows of tubes in the cold leg for possible loose part wear
- 100% video inspection of hot and cold leg tube plugs in both steam generators. Video inspection of tube plugs will be performed by NMC certified Level II NDE Technician using video tape recordings.
- A Foreign Object Search And Retrieval (FOSAR) inspection will be completed on the hot and cold legs of both steam generators at the top of the tubesheet at the periphery using a manual video probe. Retrieval equipment will be available for foreign object removal.
- A bundle flush will be completed on each steam generator concurrent with sludge lancing, which will consist of high-pressure condensate water being sprayed at the top of the tube bundle including the eggcrates and support plates to wash down any loose sludge.
- Sludge lancing will be completed on both steam generators concurrent with bundle flushing. Sludge lancing will be completed using equipment designed for Combustion Engineering steam generator tri-pitch tubing.

ATTACHMENT 2

MATERIAL FROM LICENSEE

RECEIVED SEPTEMBER 30, 2004

AS ANNOTATED

PALISADES NUCLEAR PLANT

PALISADES NUCLEAR PLANT STEAM GENERATOR STATUS REPORT SEPTEMBER 30, 2004

Steam Generator E-50A

Scope Description	Eddy Current Analyzed And Complete	Potential Indications Requiring Tube Plugging
50% bobbin full length scope	60% complete	1 wear indications > 40% (40% – vertical strap)
100% plus point top of tubesheet hot leg +3/-8 inches	91% complete	None (no indications ax, circ, vol)
8% plus point top of tubesheet cold leg +2/-2 inches	0% complete	None
100% plus point rows 1-3 u-bend	98% complete	None
25% freespan & square bend dings > 5 volts	0% complete	None
100% visual inspection of all tube plug hot and cold legs	100% complete	None
Sludge lancing & upper bundle flush	Not completed	None
Hard roll 7 non-expanded tubes into tubesheet	0% completed (will be eddy current tested prior to removal from service)	7 non-expanded will be hard rolled & plugged

Dings >5v

113 bends tested

3 (straight leg

In Steam Generator E-50A eddy current data acquisition and analysis is at 74% completed. A total of 8 tubes require potential tube plugging.

2001 2003 U-Bend Row 2 indication

PALISADES NUCLEAR PLANT

PALISADES NUCLEAR PLANT STEAM GENERATOR STATUS REPORT SEPTEMBER 30, 2004

Steam Generator E-50B

Scope Description	Eddy Current Analyzed And Complete	Potential Indications Requiring Tube Plugging
50% bobbin full length scope	71% complete	1 wear indications > 40% 42%
100% plus point top of tubesheet hot leg +3/-8 inches	96% complete	None no indications
8% plus point top of tubesheet cold leg +2/-2 inches	0% complete 1st two periphery	None
100% plus point rows 1-2 u-bend	0% complete	None
25% freespan & square bend dings > 5 volts	0% complete	None
100% visual inspection of all tube plug hot and cold legs	100% complete	None
Sludge lancing & upper bundle flush	Not completed	None
Hard roll 7 non-expanded tubes into tubesheet	0% completed (will be eddy current tested prior to removal from service)	1 non-expanded will be hard rolled & plugged

vertical strap

Dings > 5V inspections 125 } bend

39 straight leg

roll bottom few inches

In Steam Generator E-50B eddy current data acquisition and analysis is at 79% completed. A total of 2 tubes require potential tube plugging.

110 - 120 DSI - aggerates most repeats

10, 1 NQI - free span

ATTACHMENT 3

MATERIAL FROM LICENSEE

RECEIVED OCTOBER 2, 2004

AS ANNOTATED

CAP044212

Activity Type:	CAP	Submit Date:	10/2/2004 12:32:37 PM

- One Line Description: SG E-50A/B ET Bobbin Inspection in C-2 Category Expansion for Axial Indications
- Detailed Description: 10/2/2004 12:32:37 PM - HAGER, JOHN :
The Steam Generator E-50A and E-50B Bobbin eddy current inspection program has identified a single axial indication in each SG in the square bend region. Both indications are associated with dings 2 volts or less. The Bobbin program identified these indications as requiring further screening and included these indications in the special interest program. The special interest program uses the Plus Point probe to determine if ODSCC or PWSCC indications are present. After retesting both indications with Plus Point, a single axial indication was identified in each tube.

The defective tubes put SG E-50A and SG E-50B Bobbin base scope of 50% into a C-2 inspection category. The C-2 inspection category increases the base scope from 50% to 100% in each SG. The C-2 category is per Technical Specifications (TS) 5.5.8 and EPRI PWR Steam Generator Examination Guidelines: Revision 6 (EPRI Rev 6 ISI Guidelines).

The single axial indication in each SG makes this an active damage mechanism for this refueling outage and the 2006 refueling outage. The Bobbin scope in the 2006 refueling outage will be 100% in each SG.

Initiator:	HAGER, JOHN	Initiator Department:	ENPV ASME & VALVE PROGRAMS PAL
Date/Time of Discovery:	10/2/2004 12:23:27 PM	Date/Time of Occurrence:	10/2/2004 12:23:27 PM
Identified By:	Site-identified	System:	(None)
Equipment # (1st):	E-50A PAL	Equipment Name (1st):	'A' STEAM GENERATOR
Equipment # (2nd):	E-50B PAL	Equipment Name (2nd):	'B' STEAM GENERATOR
Equipment # (3rd):	(None)	Equipment Name (3rd):	(None)
Site/Unit:	Palisades		

Why did this occur?: 10/2/2004 12:32:37 PM - HAGER, JOHN :
The single axial indication occurred in the straight bend tube location and each was associated with a ding. A ding is the result of deformities caused by the initial assembly of SG tubes into the SG. A ding creates stress risers in the tube lending susceptibility to stress corrosion cracking. Heat, stress and steam generator age result in outside diameter stress corrosion cracking (ODSCC).

Immediate Action Taken: 10/2/2004 12:32:37 PM - HAGER, JOHN :
Review of TS 5.5.8, EPRI Rev 6 ISI Guidelines Section 3.3, and Palisades Degradation Assessment for the 2004 Refueling Outage.

Notified the outage control center and engineering management.

Recommendations: 10/2/2004 12:32:37 PM - HAGER, JOHN :
The current Cycle 17 accident and transient analysis reports (EA-PPD-02-01, Revision 1, "Palisades Cycle 17 Principle Plant Parameters," EMF-2838, "Palisades Cycle 17 Safety Analysis Report") allows up to 15% of the total number of tubes in each steam generator to be plugged with maximum 9% difference between the two generators for the large break loss of coolant accident (LB LOCA). Final Recorded Calculation for Palisades Small Break Loss of Coolant Accident (SB LOCA) ECCS Performance Design Basis Analysis report allows up to 15% of the total number of tubes in each team generator to be plugged. These two tubes bring the total number of tubes plugged in SG E-50A to 4.46% and in SG E-50B 4.40%.

Both steam generators are operable. The defective tubes shall be plugged and removed from service using work orders 24323693 (SG E-50A) and 24323694 (SG E-50B).

There is no issue with SG Primary To Secondary Operational Leakage in Operational Cycle 17. See attached SG Primary To Secondary Leakage graph.

There is no issue with SG structural integrity in Operational Cycle 17. Both SG single axial indications flaw sizes were below the screening criteria in the Palisades Degradation Assessment for the 2004 Refueling Outage. There is no issue with SG structural integrity in Operational Cycle 17 and these two indications do not require in-situ pressure testing.

SRO Review Required?: N

⊟ Section 2

Operability Status: Inoperable Compensatory Actions: N

Basis for Operability: 10/2/2004 1:57:31 PM - SHAFFER, ROGER A:
Per tech spec programs and manuals section 5.8.C.2 The steam generator is inoperable until tubes exceeding the plugging limit are plugged

10/2/2004 2:08:57 PM - SHAFFER, ROGER A:
Both steam generators are inoperable.This is a mode constraint for leaving mode 5 Per TS 3.4.6

Unplanned TSAC Entry: N External Notification: N

⊟ Section 3

Screened?: Y Significance Level: C

INPO OE Reqd?: N Potential MRFF?: N

QA/Nuclear Oversight?: N Licensing Review?: N

Good Catch/Well Doc'd?: NA

⊟ Section 4

Inappropriate Action:

Process:	(None)	Activity:	(None)
Human Error Type:	(None)	Human Perf Fail Mode:	(None)
Equip Failure Mode:	GAS - Abnormal stress	Process Fail Mode:	(None)
Org/Mgt Failure Mode:	(None)	Group Causing Prob:	(None)
Hot Buttons:	3B10 - RUPTURED/CRACKED/FRACTURED		

⊟ Section 5

CAP Admin:	BINNINGTON, WAYNE A	CAP Owner:	ROSS, LEONARD J
Project:	Corrective Action Process (CAP)	State:	AR Screening Que
Active/Inactive:	Active	Submitter:	HAGER, JOHN
Owner:	BINNINGTON, WAYNE A	Last Modified Date:	10/3/2004 9:08:51 AM
Last Modifier:	MACKENZIE, BRUCE C	Last State Change Date:	10/2/2004 1:57:31 PM
Last State Changer:	SHAFFER, ROGER A	Close Date:	
NUTRK ID:	GMM		
# of Children:	0		
References:			
Update:			
Prescreen Comments:			
Import Memo Field:			
OPR Completed?:	N		
OLD_ACTION_NUM:			
sub_tsid:	0	original_project_id:	69
original_issue_id:	044212		
Site:	Palisades		
Cartridge and Frame:			

⊟ Attachments and Parent/Child Links

Primary To Secondary Leakrate for Operational Cycle 17.doc (18944 bytes) by HAGER, JOHN (10/2/2004 12:26:32 PM)

Principal to CA025454: SG E-50A/B ET Bobbin Inspection in C-2 Category Expansion for Axial Indications by MACKENZIE, BRUCE C (10/3/2004 9:08:51 AM)

ATTACHMENT 4

MATERIAL FROM LICENSEE

RECEIVED OCTOBER 6, 2004

AS ANNOTATED

PALISADES NUCLEAR PLANT

PALISADES NUCLEAR PLANT STEAM GENERATOR STATUS REPORT
OCTOBER 6, 2004
Steam Generator E-50A

Scope Description	Eddy Current Analyzed And Complete	Potential Indications Requiring Tube Plugging
50% bobbin full length scope	100% complete	1 wear indications > 40% 4 axial indication in a NQI (non quantifiable indication)
50% bobbin full length expanded to 100%	100% completed	1 axial indication in a DSI (distorted support indication) R55
100% plus point top of tubesheet hot leg +3/-8 inches	100% complete	None
8% plus point top of tubesheet cold leg +2/-2 inches	100% complete	None
100% plus point rows 1-3 u-bend	100% complete	None
25% freespan & square bend dings > 5 volts	100% complete	None
100% visual inspection of all tube plug hot and cold legs	100% complete	None
Sludge lancing & upper bundle flush	In progress	None
Hard roll 7 non-expanded tubes into tubesheet	100% completed (will be eddy current tested prior to removal from service)	1 circumferential indication in a tack weld near end of hot tubesheet 7 non-expanded will be hard rolled & plugged

In Steam Generator E-50A eddy current data acquisition and analysis is 100% completed (this includes expanded bobbin scope). A total of 13 tubes require potential tube plugging.

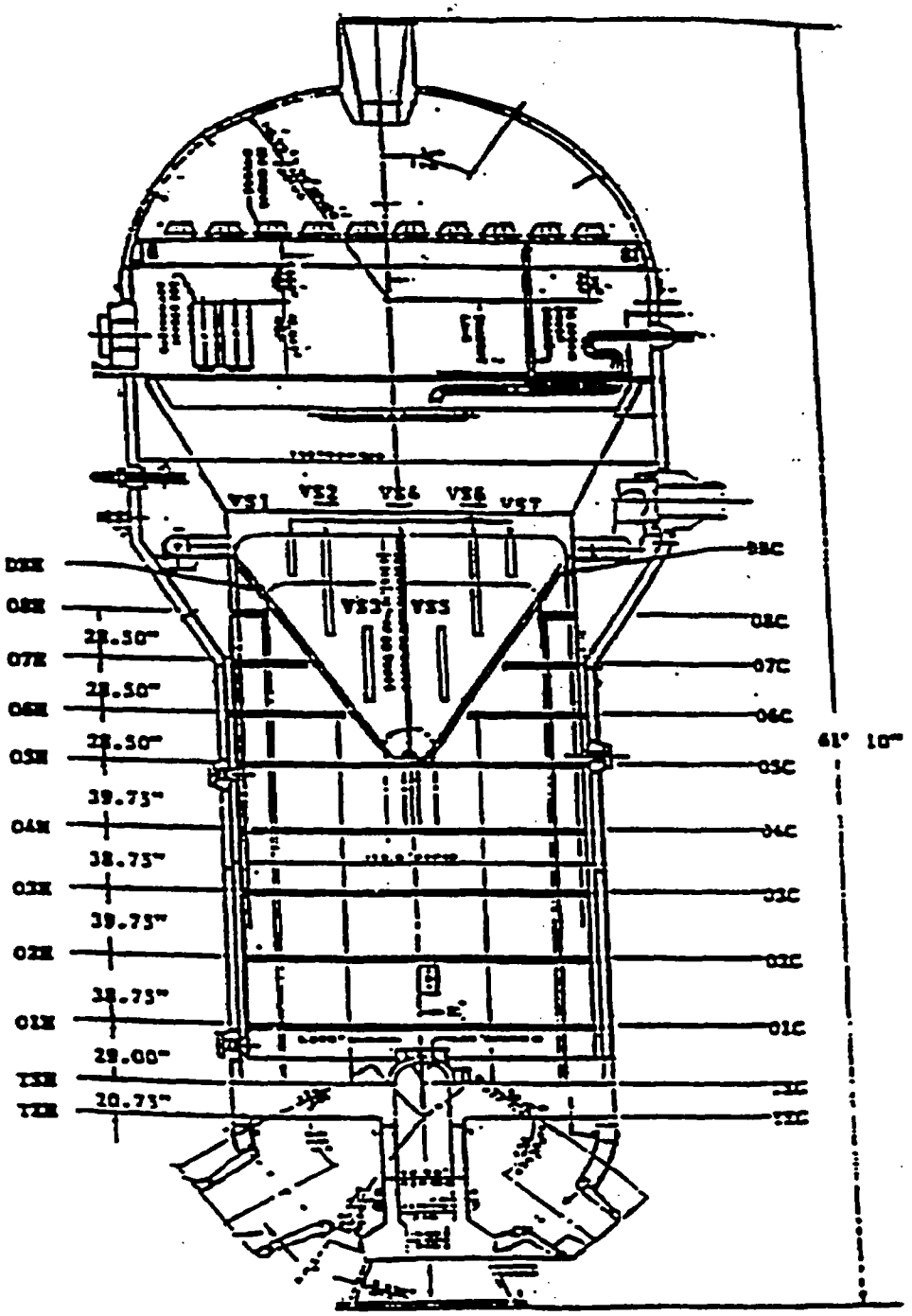
PALISADES NUCLEAR PLANT

PALISADES NUCLEAR PLANT STEAM GENERATOR STATUS REPORT
OCTOBER 6, 2004
Steam Generator E-50B

Scope Description	Eddy Current Analyzed And Complete	Potential Indications Requiring Tube Plugging
50% bobbin full length scope 50% bobbin full length expanded to 100%	99% complete 100 100 99% complete	1 wear indications > 40% 1 axial indication in a DNI (ding with indication) R78
100% plus point top of tubesheet hot leg +3/-8 inches	99% complete 100	None
8% plus point top of tubesheet cold leg +2/-2 inches	100% complete	None
100% plus point rows 1-2 u-bend	100% complete	None
25% freespan & square bend dings > 5 volts	92% complete 100 25 & 9 dings >5V	None
100% visual inspection of all tube plug hot and cold legs	100% complete	None
Sludge lancing & upper bundle flush	Completed	29 pounds of sludge removed
Hard roll 1 non-expanded tubes into tubesheet	100% completed (will be eddy current tested prior to removal from service)	1 non-expanded will be hard rolled & plugged

(100 SCC)

In Steam Generator E-50B eddy current data acquisition and analysis is at 100 98% completed (this includes expanded bobbin scope). A total of 3 tubes require potential tube plugging.


VS1
VS2
VS4
VS6
VS7
VS3
28.50"
28.50"
28.50"
39.75"
38.75"
39.75"
38.75"
29.00"
20.75"
61' 10"

Name	Description
TEH	Tube End - Hot Side
TSH	Top of Tubesheet - Hot Side
01H	First Eggcrate - Hot Side
02H	Second Eggcrate - Hot Side
03H	Third Eggcrate - Hot Side
04H	Fourth Eggcrate - Hot Side
05H	Fifth Eggcrate - Hot Side
06H	Sixth Eggcrate - Hot Side
07H	Seventh Eggcrate - Hot Side
08H	Eighth Eggcrate - Hot Side
DBH	Diagonal Strap - Hot Side
VS1	First Vertical Strap
VS2	Second Vertical Strap
VS3	Third Vertical Strap
VS4	Fourth Vertical Strap
VS5	Fifth Vertical Strap
VS6	Sixth Vertical Strap
VS7	Seventh Vertical Strap
DBC	Diagonal Strap - Cold Side
08C	Eighth Eggcrate - Cold Side
07C	Seventh Eggcrate - Cold Side
06C	Sixth Eggcrate - Cold Side
05C	Fifth Eggcrate - Cold Side
04C	Fourth Eggcrate - Cold Side
03C	Third Eggcrate - Cold Side
02C	Second Eggcrate - Cold Side
01C	First Eggcrate - Cold Side
TSC	Top of Tubesheet - Cold Side
TEC	Tube End - Cold Side

Figure 3. Palisades Support Structure Naming Convention