Prairie Island Unit 2R23 Outage*

NRC Category C-3 Phone Call

and

NRC Discussion Points

May 17, 2005

*The attached information has not been validated. In many cases, it is preliminary information from ongoing inspection activities. To our knowledge, it is the best information available as of 6 PM on the date prior to this report and may be changed following further inspection, review, and analysis.

Participants

- Ben Stephens (PI SG Program Engineer)
- Richard Pearson (alternate SG Engineer)
- Scott Redner (SG NDE Level III)
- Jim Begley (Framatome CMOA analyst)
- Jeff Kivi (PI Licensing)
- Terry Silverberg (PI Director of Engineering)
- Scott McCall (PI Engineering Programs Manager)
- Tom Downing (PI Engineering Programs Supervisor)

Current Status of 2R23 ISI SG Inspection (As of 1800 on May 16, 2005)

Category	21 SG	22 SG
Acquisition (% completed)	100	100
Analysis (% completed)	100	100
# of Pluggable Tubes	6	8
# Reroll Candidates	185	142
# of In Situ Candidates	0	0

Q1: Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed cycle.

- Leak rates based on Tritium have trended from 0.5 to 0.8 GPD over the last cycle.
- Leak rates based on Argon have been constant at 0.8 GPD over the last cycle.
- Leak rates based on Xenon have been constant (or less than detectable) at 1.0 GPD over the last cycle.

Q2: Discuss whether any secondary side pressure tests were performed during the outage and the associated results.

- Due to very low primary to secondary leakage, no pressure tests were done to look for tube leakage
- There are secondary side pressure tests scheduled after replacement of all the remaining Alloy 600 explosive plugs with Alloy 690 welded plugs
- The pressure test is not a code requirement but is based on external operating experience

Q3: Discuss any exceptions taken to the industry guidelines.

- No exceptions will be taken from industry guidelines.

Q4: For each SG, provide a description of the inspections performed including the areas examined and the probes used (e.g., dents/dings, sleeves, expansion-transition, U-bends with a rotating probe), the scope of the inspection (e.g., 100 percent of the dents/dings greater than 5 volts and a 20 percent sample between 2 and 5 volts), and the expansion criteria. Also, discuss the extent of the rotating probe inspections performed in the portion of the tube below the expansion transition region (reference NRC Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections").

- Prairie island 2R23 steam generator inspection plan is attached on the following sheet.

Inspection Plan

SCOPE	PROBE TYPE	S/G 21	S/G 22
Full Length❶	Bobbin	100%	100%
Rows 1 through 4U-Bends	MRPC	100%	100%
Rows 5 through 8❸ U-Bends	MRPC	33%	33%
Hot Leg Tubesheets	MRPC	100%	100%
Hot Leg Roll Plugs	MRPC	25%	25%
Post In Situ Pressure Test	MRPC	100%	100%
Supplemental❷	MRPC	100%	100%
Plug Visual	N/A	100%	100%
Baseline new Re-Rolls	Bobbin/MRPC	100%	100%

❶ Except the bend portion of rows 1 through 4 u-bends.

❷ ADR, CUD, DEP, DNI, DNT ≥ 5.0, DRI, DSI, DTI, INR ≥ 1.5 volts at a tube support plate, MBM, MRI, NQI, PLP (Bound MRPC PLP's), PSI, Cold Leg Thinning ≥ 40% or < 40% and ≥ 1.5 volts.

❸ Expansion plan defined in plant procedure 2H25.1.

Note: Cold Leg Tubesheet MRPC Examination is conducted every other outage.

Q5: For each area examined (e.g., tube supports, dents/dings, sleeves, etc), provide a summary of the number of indications identified to-date of each degradation mode (e.g., number of circumferential primary water stress corrosion cracking indications at the expansion transition). For the most significant indications in each area, provide an estimate of the severity of the indication (e.g., provide the voltage, depth, and length of the indication). In particular, address whether tube integrity (structural and accident induced leakage integrity) was maintained during the previous operating cycle. In addition, discuss whether any location exhibited a degradation mode that had not previously been observed at this location at this unit (e.g., observed circumferential primary water stress corrosion cracking at the expansion transition for the first time at this unit).

Analysis Status

Analysis Status (percent completed) as of 1800 on May 16, 2005:	SG 21		SG 22	
	Hot	Cold	Hot	Cold
Tubesheet Crevice MRPC	100	N/A	100	N/A
Bobbin	100	100	100	100
U-Bend MRPC	100	100	100	100
Plug MRPC	100	N/A	100	N/A
Special Interest MRPC	100	100	100	100

SG 21 Analysis Results to Date

Degradation Mode and Location	#	Volt	Depth	Length	New
TSP Cold Leg Thinning (volumetric)	97	1.70	44	0.46	N
AVB Wear (volumetric)	21	2.41	40	N/A	N
Old AVB Wear (volumetric free span)	50	2.49	38	N/A	N
Expansion PWSCC (axial)	221	1.87	N/A	0.52	N
Expansion PWSCC (circ)	1	0.75	N/A	122°	N
Crevice ODSCC (axial)	2	0.52	N/A	0.44	N
Sludge Pile ODSCC (axial)	1	0.16	N/A	0.37	N
U-bend ODSCC/PWSCC (axial/circ)	0/0	N/A	N/A	N/A	N
TSP ODSCC (axial)	0	N/A	N/A	N/A	N/A
Dent ODSCC (axial/circ)	0/0	N/A	N/A	N/A	N/A
Dent PWSCC (axial/circ)	0/0	N/A	N/A	N/A	N/A
Plug ODSCC/PWSCC	0/0	N/A	N/A	N/A	N/A

Structural and accident induced leakage integrity was maintained during the previous cycle

SG 22 Analysis Results to Date

Degradation Mode and Location	#	Volt	Depth	Length	New
TSP Cold Leg Thinning (volumetric)	140	0.69	44	0.46	N
AVB Wear (volumetric)	31	1.96	34	N/A	N
Old AVB Wear (volumetric free span)	33	2.38	38	N/A	N
Expansion PWSCC (axial)	145	3.53	N/A	0.94	N
Expansion PWSCC (circ)	2	0.65	N/A	68°	N
Crevice ODSCC (axial)	3	0.15	N/A	0.53	N
Sludge Pile ODSCC (axial)	2	0.11	N/A	0.32	N
U-bend ODSCC/PWSCC (axial/circ)	0/0	N/A	N/A	N/A	N
TSP ODSCC (axial)	0	N/A	N/A	N/A	N/A
Dent ODSCC (axial/circ)	0/0	N/A	N/A	N/A	N/A
Dent PWSCC (axial/circ)	0/0	N/A	N/A	N/A	N/A
Plug ODSCC/PWSCC	0/0	N/A	N/A	N/A	N/A

Structural and accident induced leakage integrity was maintained during the previous cycle

Q6: Describe repair/plugging plans.

Predicted Repairs

SCOPE	S/G 21	S/G 22
In Situ Pressure Test	5	5
AR1 – 6” Re-roll	155	87
AR2 – 8” Re-roll	40	14
ARE – Elevated Re-roll	14	0
Hot Leg Plug Removal	3	9
Cold Leg Plug Removal	3	15
Hot Leg Roll Plugs	10	18
Cold Leg Roll Plugs	10	18
Hot Leg Welded Plugs	3	9
Cold Leg Welded Plugs	3	15

Q6: Describe repair/plugging plans.

Required Repairs

SCOPE	S/G 21	S/G 22
In Situ Pressure Test	0	0
AR1 – 6” Re-roll	129	117
AR2 – 8” Re-roll	48	25
ARE – Elevated Re-roll	8	0
Hot Leg Explosive Plug Removal	3	9
Cold Leg Explosive Plug Removal	3	15
Hot Leg Roll Plugs	6	8
Cold Leg Roll Plugs	6	8
Hot Leg Welded Tubesheet Plugs	3	9
Cold Leg Welded Tubesheet Plugs	3	15

Q7: Describe in-situ pressure test and tube pull plans and results (as applicable and if available).

- We have no plans to pull tubes for unit 2, as part of a licensed repair program. We have, however, contracted a vendor to be mobilized for a tube pull should an inspection finding require one.
  - Status – No tube pull needed.
- We are planning on performing up to 10 in situ tests.
  - Status – No in situ needed.

Q8: Provide the schedule for steam generator-related activities during the remainder of the current outage.

- ET examinations were completed on May 16.
- In-situ testing is not required
- Repairs should be completed by May 22
- Scheduled to install primary manways May 23
- Outage schedule will be provided upon request

Q9: Discuss the following regarding loose parts: 1) what inspections are performed to detect loose parts, 2) a description of any loose parts detected and their location within the SG, 3) if the loose parts were removed from the SG, 4) indications of tube damage associated with the loose parts, 5) the source or nature of the loose parts, if known

1. A) All bobbin data is evaluated for possible loose parts (PLP) and PLP wear using manual analysis by primary.

   B) Secondary uses Computer Data Screening (CDS) with a PLP specific sort from TSH + 0.3" to 07H + 1.00" and from TSC + 0.3" to 07C + 1.00" and various wear detection sorts from TSH – 1.0" to TSC – 1.0".

   C) The bobbin examination on peripheral and open lane tubes, 4 rows and columns deep are examined in a separate group which is identified as such to the analyst for heightened analysis awareness for PLP's.

   D) All MRPC data is evaluated for PLP's.

   E) All bobbin PLP indications are tested with MRPC.

   F) All PLP indications are bounded radially by one tube at the same elevation.

   G) A Foreign Object Search and Retrieval Inspection (FOSAR) is completed on the secondary side of one SG (21 this outage) on top of the tubesheet using fiberscope equipment every outage with a contingency plan to inspect the other SG based on eddy current results.

   H) Any PLP that cannot be resolved with ECT are inspected from the secondary side for resolution.

2. A) SG 21 has 9 MRPC PLP indications on the top of the hot leg tube sheet.
   B) SG 22 has 14 MRPC PLP indications on the top of the hot leg tube sheet.

3. A) SG 21 secondary side FOSAR is scheduled following sludge lancing on May 18.
   B) SG 22 secondary side FOSAR is complete.

4. A) SG 21 has no indication of wear associated with PLP's.
   B) SG 22 has no indication of wear associated with PLP's .

5. A) SG 21 PLP indications are most likely sludge rocks based on historical lookups. Visual confirmation will be conducted with the FOSAR inspection.
   B) SG 22 PLP's – 8 indications are most likely sludge rocks based on historical lookups dating back to 1995 and 6 indications are from weld slag, machine remnants and sludge rocks.

See PLP Tables (next two slides)

SG 21 PLP's

Row	Col	Location	Wear	History	Removed	Source
29	24	TSH +0.03 to +0.20	No	Yes - 2003	?	?
39	30	TSH +0.02 to +0.31	No	Yes - 2003	?	?
38	31	TSH +0.05 to +0.25	No	Yes - 2003	?	?
39	31	TSH +0.00 to +0.35	No	Yes - 2003	?	?
31	50	TSH +0.05 to +0.25	No	Yes - 1997	?	?
32	50	TSH +0.09 to +0.45	No	Yes - 2000	?	?
32	51	TSH +0.12 to +0.50	No	Yes - 2000	?	?
6	64	TSH +0.02 to +0.24	No	Yes - 2003	?	?
7	64	TSH +0.00 to +0.23	No	Yes - 2003	?	?

SG 22 PLP's

Row	Col	Location	Wear	History	Removed	Source
23	20	TSH +0.00 to +0.44	No	Yes - 1995	No	Unknown
24	20	TSH +0.06 to +0.54	No	Yes - 1995	No	Unknown
23	22	TSH +0.67 to +1.31	No	Yes - 1995	No	Unknown
23	23	TSH +0.65 to +0.94	No	Yes - 1995	No	Unknown
26	42	TSH +0.08 to +0.29	No	No	Yes	Weld Slag
30	45	TSH +0.14 to +0.45	No	Yes - 1995	No	Unknown
31	46	TSH +0.10 to +0.33	No	Yes - 1995	No	Unknown
32	47	TSH +0.45 to +0.70	No	Yes - 1995	No	Unknown
33	47	TSH +0.13 to +0.35	No	Yes - 1995	No	Unknown
37	59	TSH +0.15 to +0.38	No	No	No	Scale
5	73	TSH -0.02 to +0.29	No	No	Yes	Machine Remnant
6	73	TSH +0.08 to +0.39	No	No	Yes	Machine Remnant
7	73	TSH +0.08 to +0.42	No	No	Yes	Sludge Rock
8	73	TSH +0.00 to +0.40	No	No	Yes	Sludge Rock