SONGS Unit 2

Steam Generator Inspections
2C14
Update with the NRC
January 23, 2006

Enclosure 2

SONGS Unit 2 Background

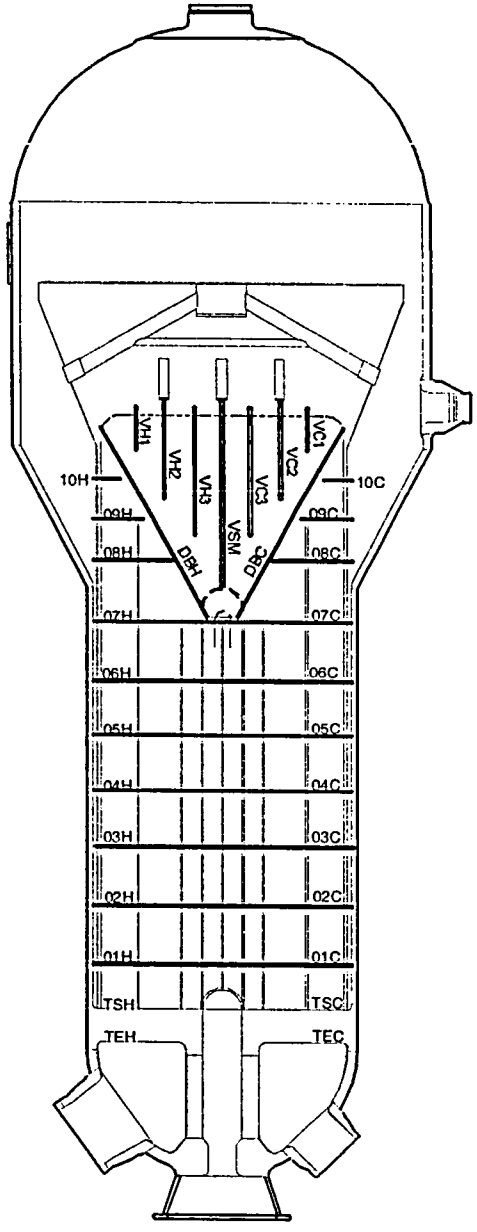
Two (2) Steam Generators

- Supplied by Combustion Engineering
- Designated SG 88 and 89
- SG88 – 8411 tubes in Service (345 sleeved)
- SG89 – 8390 tubes in Service (189 sleeved)

Recent Exam Outages

- Current Refueling Outage (2C14) ~17.8 EFPY
- Prior Mid-Cycle Exam (2M9) 10.8 EFPY
  - Prompted by PWSCC at dented intersections
- Prior Refueling Outage (2C9) 10.1 EFPY
  - Performed chemical cleaning of secondary side

SONGS
Steam Generator



Completion Status as of 01/23/2006

- Bobbin ECT Inspection – Complete
- +Point ECT Inspection ~ 97% Complete
- In-Situ Testing – Pending
- Sleeving – Cancelled
- Plugging – Following In-Situ

Note: Since exams are still in progress, all data and numbers in this presentation should be considered preliminary and subject to change.

Discussion Points (DP)

DP-1) Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed cycle.

- No primary-to-secondary leakage was detected during the last operating cycle of this unit; trends are not applicable.

Discussion Points (DP)

DP-2) Discuss whether any secondary side pressure tests were performed during the outage and the associated results.

- No secondary side pressure tests were planned since there was no primary-to-secondary leakage during operation.

Discussion Points (DP)

DP-3) Discuss any exceptions taken to the industry guidelines.

- No exceptions to the industry guidelines were taken

Discussion Points (DP)

DP-4) Description of Inspections Performed

Bobbin Exam

- Full Length Exam of In-Service Tubes (100%)

Rotating Exams (+Point)

- Hot Leg top-of-tubesheet locations (100%) (Inspecting to TSH-13.00")
- Cold Leg top-of-tubesheet locations (20%) (Inspection to TSC-13.00")
  plus tubes adjacent to tie rods and plus a 3-row peripheral tube pattern and a 2-tube pattern surrounding all new and previous eddy-current possible loose parts indications within 1 inch of the TTS.
- Rows 1-4 U-Bend Locations (100%)
- Rows 5-10 U-Bend Locations (20%)
- Installed Sleeves, Full-Length (100%)
- Hot Leg scallop bar supports (20%) (with surrounding hot leg square bend above the bar and one support elevation of tubing freespan below the bar)
- Special Interest Locations ~ 8869 locations
  - Non-quantifiable bobbin indications (I-Codes) ~ 744 locations
  - Dents = 2 volts (100%) ~ 6247 locations
  - Dings = 4 volts (100%) ~ 931 locations
  - Tube wear at supports (100%) ~ 947 locations

Discussion Points (DP)

- **DP-4) Visual inspection for foreign objects**
  - Visual inspection for foreign objects
  - No sludge lancing this outage
  - Loose part identified and retrieved in SG88
  - SG89 identified no loose parts during ECT inspection

DP-5) Inspection Results

	SG88	SG89
TSH Circ, Axial, Volumeric	~84	~42
TSC Circ, Axial, Volumetric	0	0
Freespan Axial	~2	~4
Tube Support Axial	~29	~21
Tube Support Wear (>40% TW)	~0	~0
Tube Support (Preventative)	~23	~9
Sleeves (Obstructed)	~63	~35
Misc. - Obstructed U-Bend	~1	0
Total Repairable Tubes	~202	~111

Discussion Points (DP)

DP-5) SG 88 Top Indications by Voltage

SG 88 TSH Top 2 Indications by Voltage

Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
27	33	1.16	SCI	ID	TSH	-0.14		50	2.83		33	No	No
35	49	1.12	SAI	ID	TSH	-8.31	8.71	49		N/A		No	No

SG 88 FS Top 2 Indications by Voltage

Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
41	47	0.12	SAI	N/A	01H	15.98						No	No
85	123	0.28	SAI	N/A	09C	1.07						No	No

SG 88 EC Top 2 Indications by Voltage

Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
130	124	1.44	SAI	ID	06H	0.11	0.13	21		13.38		No	No
31	113	1.16	SAI	ID	06H	0.40	0.29	57		45.52		No	No

Discussion Points (DP)

DP-5) SG 89 Top Indications by Voltage

SG 89 TSH Top 2 Indications by Voltage													
Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
118	114	3.57	SAI	ID	TEH	3.24	0.4	92		78.74		App D Exempt	App D Exempt
96	86	1.22	SAI	ID	TSH	-11.9	0.18	39		N/A		No	No
SG 89 FS Top 2 Indications by Voltage													
Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
59	103	0.25	SAI	N/A	01H	5.02						No	No
126	52	0.24	SAI	N/A	06H	22.68						No	No
SG 89 EC Top 2 Indications by Voltage													
Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	CA	Leak Test	Pressure Test
91	35	1.64	SAI	ID	05H	0.18	0.29	49		44.86		No	No
87	25	1.6	SAI	ID	04H	0.3	0.22	53		42.45		No	No

Discussion Points (DP)

DP-5) New Inspection Findings

- During the 2R14 inspection, no damage mechanisms that were new to SONGS-2 were detected
- All mechanisms were previously detected and included in the degradation assessment and the operational assessment.
- Sleeve Inspection Results (Obs=Obstructed or Partially Obstructed)

Year Installed	2004 Obs	2006 In-Service	2006 Obs	2006 %Obs
1999	0	128	4	3%
2000	0	141	1	1%
2002	10	101	42	42%
2004	N/A	164	51	31%
Total	10	534	98	18%

Discussion Points (DP)

DP-6) Repair/Plugging Plans

- **Repair**
  - All indications exceeding Technical Specification repair criteria
  - All crack-like Indications
  - Quantified (Percent) Wear Indications
    - =25% At tube support locations Diagonal Bar Hot and Diagonal Bar Cold
    - =30% At all other support locations
  - Circumferentially oriented indications will be stabilized

Discussion Points (DP)

DP-6) Repair/Plugging Plans Continued

- All Sleeves with obstructions will be plugged
- All Sleeves installed during the 2002 and 2004 outages will be preventatively plugged

Discussion Points (DP)

DP-7) In-situ Pressure Test and Tube Pull Plans

- Utilizing latest EPRI and CEOG guidelines for candidate selection and testing
- All tubes meeting criteria will be tested
- No tubes have been selected to date this outage based on EPRI/CEOG screening criteria
- No tube pulls are planned based on inspection results
- May insitu pressure test tubes with obstructed sleeves that will not allow MRPC inspection of certain bobbin indications

Discussion Points (DP)

DP-8) Schedule for SG Related Activities during Remainder of Current Outage

- 1/25/06: Complete Eddy Current
- 1/26/06: Complete Any In-Situ Testing
- 2/06/06: Complete Repairs

Discussion Points (DP)

DP-9) Discuss Loose Parts

- **What Inspections are performed to detect loose parts?**
  - Secondary Side Visual Exam
  - 100% Bobbin Probe
  - 100% TSH with rotating +Point
  - 20% TSC with rotating +Point
    - Plus a 3 row tube pattern on each side of the blowdown lane and around the peripheral annulus, plus a 2 tube pattern surrounding all new and previous possible loose parts eddy current inspections.

Discussion Points (DP)

DP-9) Discuss Loose Parts

- A description of any loose parts detected and their location within the SG
  - One loose part, small, thin strip of metal (responds to magnet), with eroded edges. Approx. 2.25 inches long, 0.03 inch thickness, with width tapering from 0.25 inches to 0.75 inches
  - Location: SG 88, Hot Leg TTS peripheral annulus
- If the loose parts were removed from the SG
  - Yes
- Indications of the tube damage associated with the loose parts
  - None
- Source or nature of the loose parts, if known
  - Indistinguishable debris