SONGS Unit 2

Steam Generator Inspections
2C15
Update with the NRC
December 14, 2007

SONGS Unit 2 Background

Two (2) Steam Generators

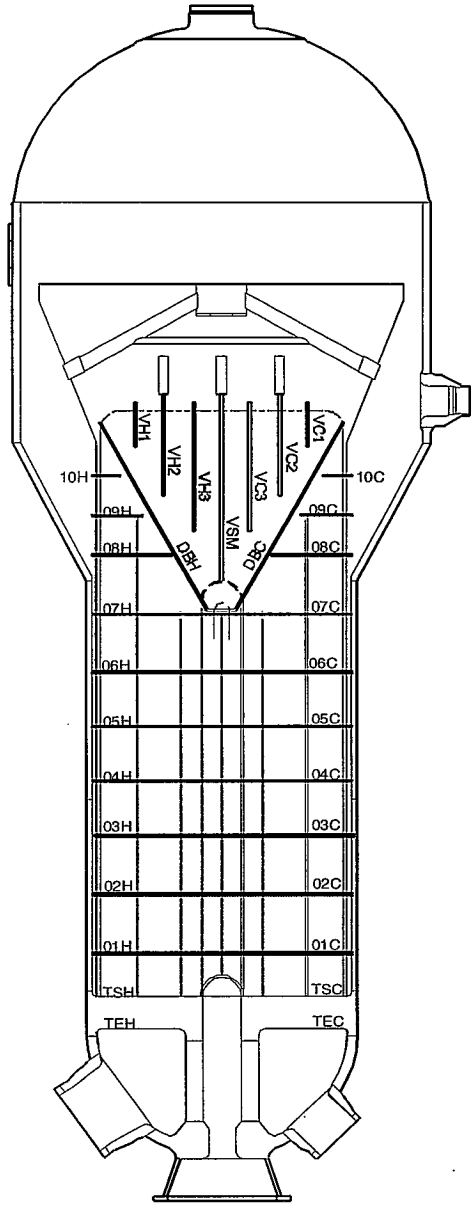
- Supplied by Combustion Engineering
- Designated SG 88 and 89
- SG88 – 8093 tubes in Service (159 sleeved)
- SG89 – 8224 tubes in Service (97 sleeved)

Recent Exam Outages

- Current Refueling Outage (2C15) ~19.4 EFPY

  Last scheduled inspection prior to replacement

SONGS
Steam Generator



Completion Status as of 12/13/2007

- Bobbin ECT Inspection – Complete
- +Point ECT Inspection – 98% Complete
- Foreign Object Search (FOSAR)
  - Complete Both SGs
- In-Situ Testing – No candidate tubes identified
- Plugging – To begin 12/15/2007

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.

- The operating SONGS Unit 3 has some reported extremely low-level primary-to-secondary leakage. Discovery was June 2, 2006, and it has remained stable at approximately $2x10^{-5}$ gallons per day. Similar leakage was noted for SONGS Unit 2 starting on July 25, 2007. This leakage is well below the threshold of detection of normal monitoring instrumentation (the condenser air ejector radiation monitor at approximately 0.1 gallons/day, a capability that is typical in the industry). This leakage was detected in the SONGS program for monitoring radioactive effluent paths of release to the environment which provides periodic monitoring (collection and measuring activity in a continuous charcoal filter sample on a weekly basis). This leakage detection is not typical in the industry because the SONGS condenser air ejector is a direct release path to the environment and is not diluted by other discharge streams. Monitoring will resume following SONGS Unit 2 restart.

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 performed.

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 or Rotating Exams (+Point)

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

Rotating Exams (+Point)

- Hot Leg top-of-tubesheet locations (100%) (TSH-13.00")
- Cold Leg top-of-tubesheet locations (100%) (TSC-13.00")
- Rows 1-3 U-Bend Locations (100%)
- Rows 4-10 U-Bend Locations (20%)
- Installed Sleeves, Full-Length (100%)
- Special Interest Locations ~ 8869 locations
  - Non-quantifiable bobbin indications (I-Codes) ~ 547 locations
  - Dents ≥ 2 volts (100%) ~ 5547 locations
  - Dings ≥ 4 volts (100%) ~ 873 locations
  - Tube wear at supports (100%) ~ 881 locations

Discussion Points (DP)

- **DP-4) Visual inspection for foreign objects**
  - Visual inspection for foreign objects (Both SGs)
  - No sludge lancing this outage

DP-5) Inspection Results

	SG88	SG89
TSH Circ, Axial	~94	~56
TSC Circ, Axial	0	0
Freespan Axial	~2	~2
Tube Support Axial	~27	~47
Tube Support Wear (>44% TW)	~0	~0
Tube Support Wear (Preventative)	~6	~16
Sleeves (Partially Obstructed)	~1	~1
Misc.	~0	~0
Total Repairable Tubes	~130	~122

DP-5) Inspection Results (2C14)

Previous Outage for Comparison	SG88	SG89
TSH Circ, Axial	84	42
TSC Circ, Axial	0	0
Freespan Axial	3	3
Tube Support Axial	36	22
Tube Support Wear (>44% TW)	0	0
Tube Support Wear (Preventative)	22	9
Sleeves (Obstructed, Partial Obs.)	62	35
Sleeves (Preventative)	111	55
Total Repairable Tubes	318	166

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	C A	Leak Test	Pressure Test
17	15	1.04	SAI	ID	TSH	-6.32	0.64	56		N/A		No	No
24	64	0.94	SAI	ID	TSH	-0.81	0.15	36		N/A		No	No

SG 88 FS Top 2 Indications by Voltage

Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	C A	Leak Test	Pressure Test
83	49	0.32	SAI	N/A	02H	2.02		0				No	No
88	60	0.2	SAI	N/A	01H	2.27		0				No	No

SG 88 EC Top 2 Indications by Voltage

Row	Col	PP Volts	Ind	Origin	Elev	Inch1	Length	Depth	PDA	FLDA	C A	Leak Test	Pressure Test
31	165	0.76	SAI	ID	05H	-0.34	0.18	66		N/A		No	No
31	165	0.6	SAI	ID	05H	0.39	0.12	39		N/A		No	No

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
98	62	1.26	SAI	ID	TSH	-13.92	0.18	55		N/A		App D Exempt	App D Exempt
52	120	0.77	SCI	ID	TSH	-0.13		63	N/A		28	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
16	56	0.12	SAI	OD	06H	-1.39		0				No	No
62	74	0.22	SAI	OD	TSH	1.36		0				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
108	52	1.11	SAI	ID	06H	0.67	0.15	49		N/A		No	No
87	31	0.82	SAI	ID	05H	0.33	0.15	51		N/A		No	No

DP-5) New Inspection Findings

- During the 2C15 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.
- A planned eddy current follow-up on industry experience (diagonal bar tube support degradation) was successfully complete in both Unit 2 SGs. The diagonal bars that cross the stay cylinder region have been verified in January 2006 and December 2007, by bobbin probe eddy current, to be in their normal locations.
- Sleeve Inspection Results (Obs=Obstructed or Partially Obstructed)

Year (Qty) Installed	2004 Obs	2006 Obs	2007 Obs	2007 In-Service	2007 %Obs
1999 (138)	0	4	2	122	1.6%
2000 (157)	0	1	0	134	0%
2002 (124)	10	41	N/A	0	N/A
2004 (172)	N/A	51	N/A	0	N/A
Total (591)	10	97	2	256	

Discussion Points (DP)

DP-6) Repair/Plugging Plans

- **Repair**
  - All indications exceeding Technical Specification repair criteria and 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
  - All Sleeves with eddy current precursor signals of obstruction will be plugged

Discussion Points (DP)

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

- Utilizing latest EPRI 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 screening criteria
- No tube pulls are planned based on inspection results

Discussion Points (DP)

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

- 12/14/07: Complete Eddy Current
- 12/15/07: Complete Any In-Situ Testing
- 12/17/07: Complete Repairs

Discussion Points (DP)

DP-9) Discuss Loose Parts

- **What Inspections are performed to detect loose parts?**
  - Secondary Side Visual Exam
  - 100% By Bobbin Probe or rotating +Point
  - 100% TSH with rotating +Point
  - 100% TSC with rotating +Point

Discussion Points (DP)

DP-9) Discuss Loose Parts

- A description of any loose parts detected and their location within the SG

  - None

- If the loose parts were removed from the SG

  – N/A

- Indications of the tube damage associated with the loose parts

  – None

- Source or nature of the loose parts, if known

  – N/A