Communication Plan
Waterford 3 Steam Generator Inspection
Scheduled for Refueling Outage 17
(April 6, 2011 through May 5, 2011)

Background

An inspection of Steam Generators will be performed during the April 2011 Refuel 17 outage to determine if there were any changes in extent of condition or the critical variables that were the basis for the RF16 operational assessment. In addition to a 100% primary side full length eddy current inspection, augmented visual inspections are being performed on the secondary. These secondary inspections include video recordings and analysis of the upper batwing welds and wrap around bar inspection around the stay cavity, diagonal 45º through-tube bundle inspection of the batwing to tube interface at the stay cavity boundary, bottom-up inspection of the batwings in the stay cylinder region, and a Foreign Object Search and Retrieval (FOSAR). The inspection acceptance criteria is derived from approved calculations that model batwing related wear progression into the tube bundle to assure the defense-in-depth repairs remain valid and bounding. Defense-in-depth repairs include stabilized tubes around the stay cavity, plugging tubes to the twenty year wear point, sentinel plugs to provide indication of unexpected wear, and additional plugs to the 40 year wear point.

Basis for the Scope of the Planned Inspections

The Waterford 3 SG Program Owner, Entergy Fleet SG Peers and Westinghouse have developed the planned inspections for RF17. This scope meets the periodic requirements contained in the SG Management Program and W3 Technical Specifications.

Waterford 3's batwing degradation condition requires specific secondary side inspections to provide visual evidence of secondary side integrity. These inspections ensure confidence that the W3 SGs are being safely managed.

Additionally, several inspections were needed in response to SG replacement delays, to assure previously identified conditions supports another cycle. Conditions that will be re-evaluated include:

- CR-WF3-2009-06504 – during the feed ring inspections of Steam Generator No.1 it was discovered that the weld between the Elbow Tee Assembly and the feed ring distribution box was broken. The part was located and was retrieved.

- CR-WF3-2009-06467 – while performing the steam drum inspections of Steam Generator No. 1 it was noted that one of the drain pipe unions was loose. There was no damage to the union and it was successfully retightened.

- CR-WF3-2009-06486 – during the initial visual inspection of video obtained during the RF16 secondary side SG Batwing 45 diagonal examination collected under WO 153098-01, the Engineering Resolution Team observed intrados tube wear which appeared to be through wall and through portions of the stabilizer on SG32 Hot Leg, Zone B, North.

Communication with the NRC

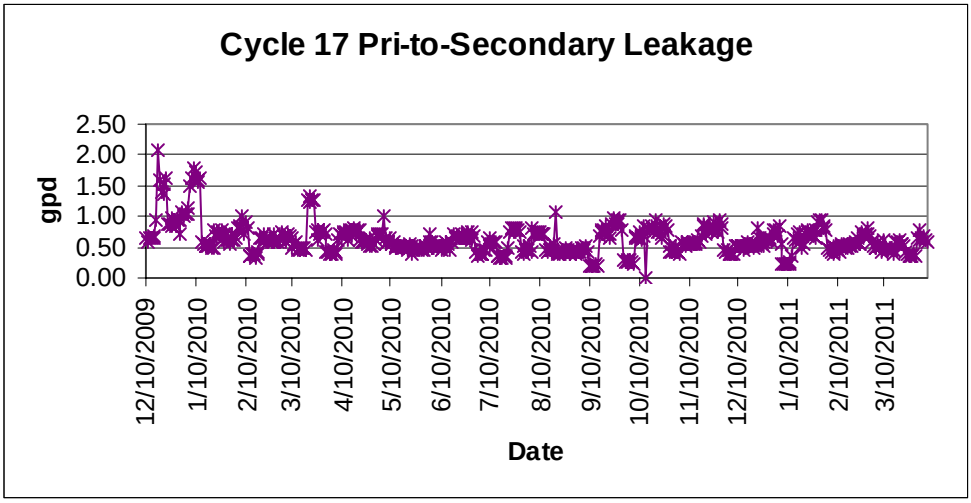
If at any time significant issues are identified that `warrant discussion with the NRC, knowledgeable Waterford 3 staff member(s) will contact appropriate NRC staff in NRR (such as the Waterford 3 project manager), Region IV Headquarters (such as the Lead NRC inspector for the ISI Inspection), and the resident inspectors located at Waterford 3.

At the discretion of the NRC, a conference call will be held between Waterford 3 staff members and NRC staff members in the Division of Component Integrity (DCI) in the Steam Generator Tube Integrity & Chemical Engineering Branch (CSGB). The call will be conducted when roughly 70% of the inspection results have been analyzed

The following discussion points have been prepared to facilitate the conference call. This conference call is scheduled to occur towards the end of the planned SG tube inspections, but before the unit completes the inspections and repairs.

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

A graph of the primary-to-secondary leakage for Cycle 17 is shown below:



Primary to secondary Leakage has remained below 2 gpd for the entire cycle. Primary to secondary leakage has remained less than 1 gpd for the last 12 months.

Waterford 3 has achieved zero fuel leakers for the entire Cycle 17.

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

No Secondary Side Pressure Tests were conducted.

3. Discuss any exceptions taken to the industry guidelines.

No exceptions or deviations have been taken to the industry guidelines.

4. For each steam generator, 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% of dents/dings greater than 5 volts and a 20% sample between 2 and 5 volts), and
- The inspection expansion criteria.

Area	Probe	Scope	Expansion
Full Length	Bobbin	100%	None
HL TTS	Plus Point	100% - C*	CL if > 1%
CL TTS - periphery	Plus Point	~ 10%	Dependent of finding
Row 1 & 2 U-bend	Plus Point	100%	Additional rows depending on finding
Wear	Plus Point	100%	None
Dents $\geq$ 2 volt at eggcrates	Plus Point	100%	None
Dents $\geq$ 2 volt at batwings	Plus Point	20%	100% depending on finding
Freespan Dings $\geq$ 5 volt	Plus Point	20%	100% depending on finding

C* inspection depth requirement is 10.6 inches – the nominal depth of inspection is -12 inches ensuring it is fully inspected.

5. For each area examined (e.g., tube supports, dent/dings, sleeves, etc), provide a summary of the number of indications identified to-date for 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).

As of 04-17-2011 1200 data files

SG31:

Area Examined	**Degradation Mode**	**Indications identified to-date**	**Most Significant Indication**		
			Volts	**Depth**	**Length**
Transition Expansion or within Tubesheet	Axial PWSCC	6 tubes	1.16	60/65	0.42 inch
	Circ PWSCC	6 below TSH	1.48	70/69	61 deg
	Axial ODSCC *	1	1.72	<80	0.34 inch
	Circ ODSCC	0			
Eggcrates/BW	Axial ODSCC	56 ind / 54 tubes	0.55	67	1.44
Eggcrates/BW/Straps	Repairable Structural Wear	0			
Freespan	Axial ODSCC	3 **	0.88	76	7.18 inches

* Potential axial crack in a ding – under further evaluation

** One tube, axial ODSCC at a ding

SG32:

Area Examined	**Degradation Mode**	**Indications identified to-date**	**Most Significant Indication**		
			Volts	**Depth**	**Length**
Transition Expansion or within Tubesheet	Axial PWSCC	5 tubes	0.96	60/ 61	0.20 inch
	Circ PWSCC	1	0.69	70 / 55	40 deg
	Axial ODSCC	0			
	Circ ODSCC	0			
Eggcrates/BW	Axial ODSCC	22 ind / 22 tubes	.26	51	0.68 inch
Eggcrates/BW/Straps	Repairable Structural Wear	2: 40% BW4 42% BW5	N/A	42	N/A

All locations satisfy structural and leakage integrity performance criterion.

No new degradation modes reported.

6. Describe repair/plugging plans.

All cracks identified are plugged on detection/confirmation, regardless of location. Any wear indications greater than or equal to 40% through wall are plugged on detection. Circumferential cracking within 3 inches of the top of the tubesheet are stabilized.

All other circumferential cracks are also stabilized.

Loose parts and batwing degradation are evaluated individually for stabilization.

Plan is to transition to repair approximately on 4/20/2011

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

Condition report CR-WF3-2011-02578 has identified a flaw in SG31 Row 9 Column 125 in the freespan between 01Hot and 02Hot eggcrate supports that based on the size of the flaw, screening and profiling for possible in-situ pressure testing. This flaw is inspected with the Appendix I technique of the SG Program Guidelines. In-situ testing is a contingency for RF17 and can be completed under the SG Inspection (52293369) and Repair (259182) work orders.

CR-WF3-2011-02616 Second Flaw in SG31 Requires In-Situ Pressure Testing. A flaw was found in SG31 Row 74 Column 88 at BW1. Based on the size of the flaw, screening and profiling for possible in-situ pressure testing is required. This flaw is inspected with the Appendix I technique of the SG Program Guidelines. In-situ testing is a contingency for RF17 and can be completed under the SG Inspection (52293369) and Repair (259182) work orders.

CR-WF3-2011-02642 Third Flaw in SG31 Requires In-Situ Pressure Testing. A flaw was found in SG31 Row 95 Column 55 between 01H and 02H. Based on the size of the flaw, screening and profiling for possible in-situ pressure testing is required. This flaw is inspected with the Appendix I technique of the SG Program Guidelines. In-situ testing is a contingency for RF17 and can be completed under the SG Inspection (52293369) and Repair (259182) work orders.

There are no plans for a tube pull.

8. Discuss the following regarding loose parts:

a) The inspections that are performed to detect loose parts,

Primary – 100% hot leg top of tubesheet with MRPC / Periphery on CL TTS +/- 3 inches and 3 tubes in; 100% Bobbin tube end hot (TEH) – tube end cold (TEC)

Secondary – foreign object search and retrieval (FOSAR) cart exam of annulus; Blowdown Lane Exam with camera system; “Bottom Up” composite with Analysis

by Engineering Resolution Team. Wrap around bar to batwing visual inspection and the 45 degree inner bundle inspection.

b) A description of any loose parts detected and their location within the SG (including the source or nature of the loose part, if known),

Currently there is one loose part confirmed in the #2 SG. This part on the periphery was associated with eddy current calls of PLP (Potential Loose Part) on three tubes. The two tubes where the part was located had been previously plugged. The tubes with PLP calls were inboard of those tubes. The tubes have had the same PLP indication since 2006.

The #1 SG FOSAR has not started.

c) If the loose parts were removed from the SG, and

Retrieval of the part was attempted but the part could not be retrieved.

d) Indications of tube damage associated with the loose parts.

There was no new wear or tubing degradation associated with the PLP calls.

9. Discuss the scope and results of any secondary side inspection and maintenance activities (e.g., in-bundle visual inspections, feedring inspections, sludge lancing, assessing deposit loading, batwing condition, etc).

Waterford 3 completed the SG#1 and 2 wrap around bar inspections with no changes noted. All of the batwings were attached to the wrap around bar and no twisting or distortion of the wrap around bar or upper batwings was evident.

Waterford 3 also completed the SG#1 and 2 45-degree through bundle inspections. Evidence of wear on the stabilizer was found in the inner tubes to the stay cylinder area. See below for details

A visual inspection will be performed on both generators at the top of tubesheet.

Eddy current possible loose part (PLP) locations will be provided to the Secondary Inspection Crew for their use.

No Sludge Lancing will be performed.

10. Discuss any unexpected or unusual results.

CR-WF3-2011-02450 Previous batwing inspection reports incorrectly identified the location of the intrados tube wear. Until RF17 this description of the physical location of the damaged tube was not a critical factor in the analysis of the material condition of the steam generator. Though the location was described incorrectly, the inspections and the conclusions of the physical damage observed remained valid. RF17 inspection of the intrados tube wear required verification of the location because it is critical to accurately perform a stabilization repair plan.

CR-WF3-2011-02578 A flaw was found in SG31 Row 9 Column 125 in the freespan between 01Hot and 02Hot eggcrate supports. Based on the size of the flaw, screening and profiling for possible in-situ pressure testing is required. This flaw is inspected with the Appendix I technique of the SG Program Guidelines. In-situ testing is a contingency for RF17 and can be completed under the SG Inspection (52293369) and Repair (259182) work orders. Following testing of the tube, it shall be removed from service by mechanical plugging to return the generator to an operable condition. Additionally this will require expanding the eddy current scope to include distorted freespan historical (DFH) indications in both steam generators, in accordance with the EPRI guidelines.

CR-WF3-2011-02616 Second Flaw in SG31 Requires In-Situ Pressure Testing. A flaw was found in SG31 Row 74 Column 88 at BW1. Based on the size of the flaw, screening and profiling for possible in-situ pressure testing is required. This flaw is inspected with the Appendix I technique of the SG Program Guidelines. In-situ testing is a contingency for RF17 and can be completed under the SG Inspection (52293369) and Repair (259182) work orders.

CR-WF3-2011-02642 A flaw was found in Steam Generator 31 (SG MSG0001) tube Row 95 Column 55 in the freespan between 01Hot and 02Hot eggcrate supports. Based on the size of the flaw, screening and profiling for possible in-situ pressure testing is required. This flaw is inspected with the Appendix I technique of the SG Program Guidelines.

11. Provide an update on the re-evaluation of the following conditions discovered during the RF16 secondary side inspections:

- Broken weld between the Elbow Tee Assembly and the feed ring distribution box.

  Inspection results have not been completed. – Currently in progress.

- Loose drain pipe line in Steam Generator No. 1.

  Inspection results have not been completed. – Currently in progress.

- Intrados tube wear through wall and through portions of the stabilizer on SG32 Hot Leg, Zone B – North.

  Location was re-inspected and the as-found conditions are similar to the as-left conditions coming out of the previous outage (RF16). Condition is acceptable to leave as-is.

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

Completion of eddy current testing program in both steam generators includes special interest, bobbin retests and plug visuals. Completion by April 20, 2011

Completion of tube plugging from eddy current testing results in both steam generators. Completion by April 22, 2011

Completion of foreign object search and retrieval (FOSAR) in both steam generators. Completion by April 22, 2011