STEAM GENERATOR INSPECTION PLANNING
SL2-14 APRIL 2003 - NRR, WHITE FLINT

AGENDA

- Purpose of Meeting
- Background
- SL2-14 Inspection Scope
- Projected Tube Plugging
- Inspection Criteria Changes
- Contingency Planning
- Contingency License Amendment Request
- Summary & Closing

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Purpose of Meeting

- Review SL2 S/G Condition
- Review SL2-14 Inspection Plans
- Address Staff Request to NEI on Tubesheet Inspections
- Identify & Address Any Staff Concerns

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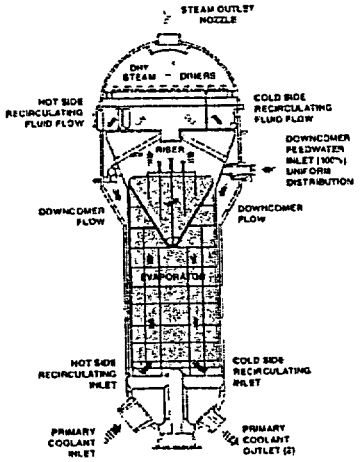
Background

S/G Design

- CE Model 3410
- 8411 Tubes / SG
- ~16.8 EFPY @ SL2-14
- A-600 HTMA Tubing
- CS Lattice Support System
- Tubesheet Joint - Explosive
- Total Tubes Plugged
  - SG A - 474 (5 6%)
  - SG B - 539 (6 4%)
- T-Hot ~600°F



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Background

FPL Steam Generator Program

- Committed to Safe Operation
- Full Implementation of NEI 97-06, S/G Program Guidelines
  - Inspection
  - Chemistry
  - Leak Monitoring
- Incorporate Industry Experience
- Extensive Examination History at Unit 2
- Conservative Approach
  - In Situ Pressure Test at Last 4 Inspections

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Background

- Last Inspection - SL2-13 in December 2001
- Operational Assessment Presented May 2, 2002
  - Most Damage Mechanisms as Expected
  - Increase in Axial ODSCC at Eggcrate Supports
  - On-set of Axial ODSCC at Dings
  - Degradation Trend Typical for Unit with A-600 MA Tubing

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Background

Indication Count at SL2-13 (11/01)

Mechanism	S/G A	S/G B	Total
Axial ODSCC at Eggcrates	97	201	298
Axial ODSCC at Dings	5	1	6
Axial ODSCC at Tubesheet (Hot)	8	16	24
Axial IDSCC below Tubesheet (Hot)	2	0	2
Circumferential ODSCC at Tubesheet (Hot)	4	9	13
OD Volumetnc	0	2	2
Wear at Tubesheet (Cold)	0	5	5
Wear at Tube Diagonal and Vertical Supports	581	397	978
Tubes Plugged at SL2-13	129	232	361

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Background

In Situ Pressure Testing at SL2-13

Mechanism	Tested	Pressure
Axial ODSCC at Eggcrates	9	4950 psi
Axial ODSCC at Dents	5	4950 psi
Axial ODSCC at TTS	6	4950 psi
Axial IDSCC below TTS	2	4950 psi
Circ ODSCC at TTS	4	5550 psi
OD Volumetric TTS	1	4950 psi
Total Tested	27	

No Leakage or Burst

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SL2-14 Inspection Scope

- Visual Examination of All Tube Plugs
- Bobbin Probe All Active Tubes
  - Full Length Row 3-140
  - Straight Length Row 1-2
  - Screening of Dings <5 Volts
- Plus Point Probe
  - 100% Hot Leg Top of Tubesheet (+3"/-5")
  - 20% Cold Leg Top of Tubesheet (+3"/-5")*
  - 25% Row 1-2 U-bends
  - 20% Wear Scars in U-bends*

*Added for SL2-14

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SL2-14 Inspection Scope (Con't)

- Plus Point Probe for Dings
  - All Dings Hot Leg Tubesheet to 1st Support (A=45, B=36)
  - All Dings >5 volts 1st Support to Hot Leg Bend (A=73, B=90)
  - All Dings in HL & CL Square Bends Row 19-140 (A=8, B=5)
  - All Dings >5 volts in Horizontal Run Row 19-140 (A=76, B=117)
  - All Dings in U-Bend Region Rows 1-18 (A=107, B=114)
  - 20% of Dings >5 volts TSC to CL Bend (A=17, B=25)*

*SL2-13 Included All Dings >10 volts TSC to CL Bend

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Projected Tube Plugging

Mechanism/Location	Predicted Number EOC 13
Axial ODSCC at Eggcrate Supports	150 – 200
Axial ODSCC at Top of Tubesheet	40 – 60
Circumferential ODSCC at Expansion Transitions	15 – 25
Axial ODSCC at Dings	5 – 20
Axial IDSCC Below Secondary Face of Tubesheet	5 – 10
TOTAL PROJECTED	215 - 315

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Inspection Criteria Changes to Address Operating Experience

- Look Backs & Reporting Issues
  - Look Backs Over Longer Period
  - Apply Low Frequency Screen to U-bends & Square Bends
  - Modify Reporting Criteria to Include Flaw-like Indications <1%
- High Residual Stress - Manufacturing
  - Existing Issue for MA Tubing Plants
  - Screening Addressed by Existing Data Analysis Guidelines

Contingency Planning

- Cold Leg Top of Tubesheet - Complete 100%
- Row 1&2 U-bends - Complete 100% and 20% Row 3
  - Continue Until No Defective U-bends
- U-bend Wear Scars - 100% Hot Leg & 20% Cold Leg
- Cold Leg Dings >5Volts - Complete 100%
- Freespan Cracking - See Next Pages

Contingency Planning (Con't)

- Overview Of Freespan Contingency Plan
  - Discussed with NRC prior to Last 4 Inspections
  - Sampling Methodology to Optimize Use of Resources
  - Statistical Basis for Operational Assessment
  - Reduces Risk of not Inspecting Affected Areas
  - Modified for SL2-14 Based on Industry Experience

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Contingency Planning (Con't)

Free Span Cracking Plan

- Complete 100% Bobbin Coil Screening
- Plus Point Inspect Indications that are New or Show Change
- If Cracking is Confirmed:
  - Inspect Entire Straight Length On Side With Crack
  - Inspect 6 Neighbor Tubes at Same Span
- Validate Bobbin Probe POD
  - If Acceptable - End Free Span Program
  - If Not Acceptable - Proceed to Sampling Schemes

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Contingency Planning (Con't)

- Evaluate Locations of All Confirmed Free Span Cracks
- Determine Applicable Inspection Scenario
- Select Appropriate Sample Scheme
  - Maximize Use of Resources
  - Maximize Potential to Demonstrate Full Cycle Tube Integrity

SCENARIO	DEGREE	CLUSTERED	# CRACKS	SAMPLE SCHEME
CASE 1	NONE	N/A	0	NONE
CASE 2	MINIMAL	YES	<15	LHS
CASE 3	MINIMAL	NO	<15	LHS
CASE 4	MODERATE	YES	15-50	IMPORTANCE
CASE 5	MODERATE	NO	15-50	REDUCED LHS
CASE 6	SEVERE	YES	>50	IMPORTANCE
CASE 7	SEVERE	NO	>50	SYSTEMATIC*

LHS – Latin Hypercube Sampling
*Optimized to support bobbin POD

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Contingency Planning (Con't)

Case 2 or 3 Most Likely Scenario for Free Span Cracking

- Latin Hypercube Sampling Scheme
  - Proven Efficiency vs. Random Sampling
  - Provides Optimal Coverage
  - Widely Used Strategy in Monte-Carlo Simulation
  - Good Approach for Uncertainty in Extent of Condition
  - Robust Approach

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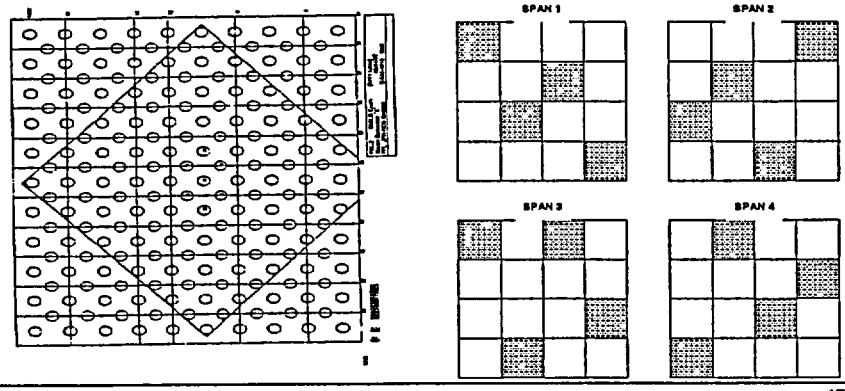
Contingency Planning (Con't)

LHS Example: Generate 11 X 11 Tube Box Around Tubes w/Crack Sample Affected Region to Cover All Possibilities



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Contingency License Amendment Request

Change Definition of a Tube Inspection

- Contingency for Cycle 14 Only if Circumferential Cracks Detected in Tubesheet
- Limit Inspection Within the Tubesheet to 5"
- Similar to Recent Requests Approved for 1 Cycle
- Based on CEOG Work & Site Specific Topical
- NEI Letter of February 3, 2003 Responded to Staff Request for Information (15 Plants)

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Contingency License Amendment Request

Recent Inspections & Results for Indications Below the Hot Leg Top-of-Tubesheet (TTS)

- No Circumferential Indications To Date Below TTS

Outage	HL-TTS Scope	Test Extent	Axials	Location	Depth	Length
SL2-10	100%	-2"	1	1.10"	93% (1)	0.22" (1)
SL2-12	100%	-2"	1	0.17"	90% (2)	0.12" (2)
SL2-13	100%	-5"	2*	2.10"	75% (2)	0.23" (2)

* 2 Indications In 1 Tube - Passed In Situ Pressure Test
(1) Max Depth/Length (2) Structural Depth/Length

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Summary & Closing

- FPL Program Meets Industry Guidance
- Reasonable Assurance of Tube Integrity
- Basis for Limiting Inspections Tubesheet
  - Contingency for Cycle 14 Only
  - Continue Effort Through NEI for Long-Term Resolution
- Identify & Address Staff Concerns

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