

INDIAN POINT 2 STEAM GENERATOR TUBE FAILURE TIMELINE
Revision B, 6/22/2000

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Date - Qtr	NRC	INDIAN POINT 2	WESTINGHOUSE or EPRI	OTHER LICENSEES
2000 - 2			W - NSAL-00-007, SG Design Delta-P Issue, 5/5/00	Low radius U-bend history from 6/19/2000 RAI. Dominion Engineering Report L-4021-00-1, April 10, 2000, "Results of U-bend PWSCC Update to Predictions in DEI-519, Steam Generator Tube Life Prediction Analysis for Indian Point 2," draft.
2000 - 1	February 15 SG tube failure event. NRC letter, Jefferey Harold to A. Alan Blind of ConEdison, "Indian Point Nuclear Generating Unit No. 2 (IP2) - Request for Additional Information Re: Proposed Steam Generator Tube Examination Program (TAC No. MA8219)", Request for Additional Information.	EOC14 Tubes plugged: TSP denting & SCC = 17 (373); hot leg roll = 100 (139); pitting = 300 (735); U-bend PWSCC = 8 (9); PWSCC = (2); other = 170 (662); R2 U-bend preventive 196 (196); Total = 791 (2116) current(cumulative) One probe restriction, 17 sludge pile. Tube leak: 109 gmp, SG24 R2 U-bend. SGs enter C3.		
1999 - 4	NRC Safety Evaluation on Tech Spec amendment. Inspection Plan submitted	Plant restarted.	Eddy Current Data Quality Specification for Inspection of Steam Generator Tubes, Vol. 1, Bobbin coil Probe, EPRI document TR-114206-VI, Dec. 1999.	
1999 - 3		Plant shutdown due to Tap Changer Event.		

#1
NO CORRECTION
Found in office file

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1999 - 2		IP2 Licensing Amendment 201, revises Tech Specs Section 4.13A.2.a to allow an extension to the SG inspection interval to coincide with the year 2000 refueling outage and Tech Spec 4.13C.1 to remove the requirement of receiving NRC concurrence on the licensee's proposed SG examination program. Indian Point 2 letter from Con Edison James Baumstark to NRC, "Response to Request for Additional Information - Pprposed Amendment to Technical Specifications Regarding Steam Generator Tube Inservice Inspection Frequency," May 12, 1999.		
1999 - 1				
1998 - 4	NRC Draft Regulatory Guide DG-1074, Steam Generator Tuube Integrity, Dec 1998.	Indian Point 2 letter form Con Edison, A. Blind, "Proposed Amendment to Technical Specifications Regarding Steam Generator Tube Inservice Inspection Frequency," December 7, 1998.		
1998 - 3	SECY-98-248, Proposed Generic Letter 98-XX, "Steam Generator Tube Integrity."			
1998 - 2				
1998 - 1				
1997 - 4	NRC IN 97-88, Experiences During Recent SG Inspections, 12/16/97 NRC GL 97-05, Steam Generator Tube Inspection Techniques, 12/17/97 NRC GL 97-06, Degradation of Steam Generator Internals			NEI 97-06, "Steam Generator Program Guidelines," December 1997.

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1997 - 3		During EOC13 used new non-rotating probe, CECCO-5, to examine tubes within support plates, tube sheet and sludge pile areas through the first support plate. Probe could identify cracking that bobbin coil probes could miss. Indian Point Memo, from Steam Generator Desing and Analysis to W.F. Cullen, "Indian Point 2 Sring 1997 Inspection Evaluation," NSD-E-TAP-0053, July 24, 1997.	EPRI Report TR-106589-V1, "PWR Steam Generator Examination Guidelines: Revision 4, Volume 1: Guidelines," Final report, June 1996. Con Edison member: none. EPRI Report TR-107569-V1R5, "PWR Steam Generator Examination Guidelines: Revision 5, Volume 1: Requirements," Rev. 5, Final report, Sept 1997. Con Edison member: Pete Skulte, formerly a Con Edison employee, currently a contractor hired by Con Edison in conjunction with the SG tube failure event. EPRI Report TR-107622, Rev. 0, "Steam Generator Tube Integrity Assessment Guideline," Sept 1997.	
1997 - 2	NRC IN 97-88, Degradation in Small Radius U-Bend Cracking in SG Tubes, 5/19/97. NRC Memo, Jefferey Harold to Stephen Quinn on "Proposed Steam Generator Tube Examination Program for Indian Point Nuclear Generating Unit No. 2 (TAC No. M98068)", May 29, 1997.	EOC13 Tubes plugged: TSP denting & SCC = 71 (356); hot leg roll = 32 (39); pitting = 20 (435); U-bend PWSCC = 1 (1); PWSCC = (2); other = 49 (492); Total = 173 (1325) current(cumulative) One probe restriction, 12 sludge pile. 100% inspection with CECCO 5 probes. Indian Point 2 letter from S. Quinn to NRC on "Proposed Steam Generator Tube Examination Program - 1997 Refueling Outage," Feb 7, 1997. Indian Point 2 1997 Steam Generator Tube Inspection Plan, April 24, 1997.		

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1997 - 1		IP2 Licensing Amendment 192, 5/20/97, revised Tech Spec to incorporate commitments made in connection with amendment 183, which authorized installation of laser welded SG sleeves inside defective tubes. IP2 Licensing Amendment 189, 4/9/97, revises Tech Spec Section 4.13-2 to allow an extension of the interval for SG tube inspection, extending the inspection date from April 14, 1997 to May 2, 1997.		
1996 - 4				ANO 2, 65 gpd, axial crack (#1H eggcrate)
1996 - 3				Byron 2, 120 gpd, loose part.
1996 - 2	NRC IN 96-38, Results of SG Tube Examination, 6/21/96			
1996 - 1				
1995 - 4	NRC IN 95-40, Supplemental Information to GL 95-03, Circumferential Cracking of SG Tubes, 9/20/95			"Steam Generator Tube Life Prediction Analysis for Indian Point 2," DEI-442, October 1995, by Dominion Engineering. Draft.
1995 - 3	NRC GL 95-05, Voltage-Based Repair Criteria for Westinghouse SG Tubes Affected By ODS CC, 8/3/95	Secondary water chemistry 1995: - present: ammonia, hydrazine, boric acid, and ETA. See Table in Notes.		
1995 - 2	NRC GL 95-03, Circumferential Cracking of SG Tubes, 4/28/95.	IP2 Licensing Amendment 183, 5/19/95, revises Tech Spec Sections 3.1.F and 4.13 to allow the repair of SG tubes by using laser welded sleeves. IP2 Licensing Amendment 180, 3/13/95, revises Tech Spec Sections 3.1.F and 4.13 to allow the repair of SG tubes via the implementation of an F* criteria. Indian Point 2 letter from S. Quinn to NRC on "Steam Generator Tube Inservice Examination 1995 Refueling Outage." dated June 14, 1995		

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1995 - 1		EOC12 Tubes plugged: TSP denting & SCC = 1 (285); hot leg roll = 2 (7); pitting = 12 (415); PWSCC = 2 (2); other = 4 (443); Total = 21 (1152) current (cumulative). First use of CECCO 5 eddy current probes. 11,909 tubes tested. Removed 2,499 lbs. Tube leak in SG22 found on hydro (R4C92 @ SP3). Tube leakage: 8.6 gpd (existed since 1984), SG22, dent 3H-axial.		
1994 - 4	NRC Information Notice 94-88, "Inservice Inspection Deficiencies Result in Severely Degraded Steam Generator Tubes," Dec 1994			
1994 - 3	NRC IN 94-62, Operational Experience on SG Tube Leaks and Tube Ruptures, 8/30/94		EPRI TR-104030, Project 2812-15, Final Report, July 1994, "PWSCC Prediction Guidelines."	Sequoia 2 - previously experienced leakage at R1 U-bend due to PWSCC, several Huntington tubes. [Date for recurrence estimated.] Oconee 2, 144 gpd, fatigue. Maine Yankee, 50 gpd, circum crack PWSCC.
1994 - 2	NRC IN 94-43, Determination of P/S SG Leak Rage, 6/10/94			Doel 2 - Row 2 U-bend indication (14.9 EFPY).
1994 - 1				McGuire 1, 100 gpd, leaking sleeve. Oconee 3, 144 gpd, fatigue. South Texas, 160 gpd, leaking plug. Zion 2, 1440 gpd, tubesheet crevice IGA (OD)
1993 - 4				Braidwood 1, 300 gpd, freespan crack between 2 AVBs
1993 - 3	NRC IN 93-52, Draft NUREG-1477, Voltage-Based Interim Plugging Criteria For SG Tubes, 7/14/93			
1993 - 2				Kewaunee, 100 gpd, leaking tubesheet plug. McGuire 1, 185 gpd, sleeve failure.