


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)	
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Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, N.Y. 10511-0249
Tel (914) 254-6710

Robert Walpole
Licensing Manager

NL-13-032

August 15, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Technical Specification 5.6.8 – IP3 Steam Generator Tube Inspection Report -
Spring 2013 Refueling Outage
Indian Point Unit No. 3
Docket No. 50-286
License No. DPR-64

REFERENCE 1. Entergy letter to the NRC, NL-07-083 'Steam Generator Tube Inspection Report for Spring 2007 Refueling Outage', dated July 19, 2007

Dear Sir or Madam:

Entergy Nuclear Operations, Inc (Entergy) is providing in Enclosure 1 the Steam Generator (SG) Tube Inspection Report required by Indian Point 3 Technical Specification 5.6.8. Technical Specification 5.6.8 requires that a report be submitted to the NRC 180 days after the initial entry into Mode 4 following completion of a steam generator program inspection. Entergy performed a SG inspection in March 2013 during unit 3 refueling outage 3R17. The unit initially entered MODE 4 following this inspection on March 25, 2013. This inspection was the 7th in-service inspection (ISI) following SG replacement in 1989 and the 1st of 2 scheduled inspections in the 2nd inspection period.

The scope of the inspection included all four steam generators, which are Westinghouse Model 44F with thermally treated Alloy 690 tubes. At the time of the inspection, the steam generators had approximately 205 effective full power months of operation since the first inservice inspection performed in 1990. All four steam generators were found to be in compliance with condition monitoring requirements. The previous inspection was performed during the spring 2007, Refueling Outage 3R14 (reference 1).

ADD
NRC

There are no new commitments contained in this letter. If you have any questions or require additional information, please contact me at 914-254-6710.

Sincerely,

A handwritten signature in black ink, appearing to read "RW Murray", with a long, sweeping flourish extending to the right.

RW/mb/rd

cc: Mr. William Dean, Regional Administrator, NRC Region 1
Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. Peter Habighorst, Material Control and Accounting Branch, NRC
IPEC NRC Resident Inspector's Office
Mr. Francis J. Murray, President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Department of Public Service

ENCLOSURE 1 TO NL-13-032

Steam Generator Examination Program Results 2013 Refueling Outage (3R17)

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT 3
DOCKET NO. 50-286

Indian Point Unit 3
Steam Generator Examination Program Results
2013 Refueling Outage (3R17)

1.0 Introduction

Indian Point Unit 3 Technical Specification (TS) 5.6.8 Steam Generator Tube Inspection Report, requires Entergy Nuclear Northeast to submit a report to the NRC within 180 days after initial entry into Mode 4 following a steam generator inspection performed in accordance with Technical Specification 5.5.8, Steam Generator (SG) Program. The report shall include:

- a. The scope of inspections performed on each SG,
- b. Active degradation mechanisms found,
- c. Nondestructive examination techniques utilized for each degradation mechanism,
- d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,
- e. Number of tubes plugged during the inspection outage for each active degradation mechanism,
- f. Total number and percentage of tubes plugged to date,
- g. The results of condition monitoring, including the results of tube pulls and in-situ testing, and
- h. The effective plugging percentage for all plugging in each SG.

Entergy performed a SG inspection in March 2013 during refueling outage 3R17. This inspection was the 7th in-service inspection (ISI) following SG replacement in 1989 and the 1st of 2 scheduled inspections in the 2nd inspection period. The unit initially entered MODE 4 following this inspection on March 25, 2013.

2.0 Steam Generator Background

The original Westinghouse Model 44 SG's at Indian Point 3 were replaced in 1989 with Westinghouse Model 44F SG's. Each SG has 3214 tubes made from thermally treated Alloy 690. The nominal OD of each tube is .875 in. and the nominal tube wall is .050 in. thick. At the time of the 2013 refueling outage (3R17) at Indian Point 3, the steam generators had accumulated approximately 205 effective full power months (EFPM) of operation since the first in-service inspection performed in 1990. Refueling outage 3R17 was the first of two refueling outages in the second inspection period of 108 EFPM as defined in section 5.5.8.d.2 of Technical Specifications and the first scheduled inspection of the period. The steam generator inspections were performed in March 2013.

Indian Point 3 Steam Generator Primary Inspection Plan

Outage	Year	Cycle EFPM	SG Cumulative EFPM	Inspection Period EFPM	Sequential Inspection Period	Notes
3R07	1990	13	13	N/A	n/a	First ISI

3R08	1992	13.6	26.6	13.6	First	
3R09	1997	18.6	45.2	32.2		
3R10	1999	21.5	66.7	53.7		
3R12	2003	39.7	106.4	93.4		Skip 1 outage
3R14	2007	44.7	151.1	138.1		Skip 1 outage
3R17	2013	67	218.1	67	Second	Skip 2 outages
3R19	2017	45 est.	263 est.	112 est.		Skip 1 outage
3R21	2021	45 est.	308 est.	45 est.	Third	Skip 1 outage
3R22	2023	22.5 est.	330 est.	67.5 est.		Skip 1 outage

3.0 Required Report Content - The following information is provided as required in Section 5.6.8 of IP3 Technical Specifications

a) Scope of Inspections

The eddy current examination scope consisted of the acquisition of 50% of all tubes in all four steam generators full length with a bobbin probe, 60% of the hot leg 1st span and 22% cold leg 1st span with an X-probe array coil probe, 50% of rows 1 and 2 u-bends with the single coil +Pt rotating probe. In addition, tubes containing indications from previous examinations were examined. All indications identified during the bobbin coil had a diagnostic examination performed with the +Pt coil. The data analysis scope included the bobbin coil data, the array coil data, all +Pt coil data, and AVB position verification.

In addition to the eddy current inspections, visual inspections were performed on all tube plugs and on the primary bowl drain area.

Sludge lancing and Foreign Object Search and Retrieval (FOSAR) was performed on the secondary side of all SG's. Secondary side Steam Drum and Top Tube Support Plate (TTSP) inspections were performed on 2 SG's.

b) Active Degradation Mechanisms

No active degradation mechanisms were found during the SG inspection in 3R17.

c) Nondestructive Examination Techniques

NDE Techniques used for Potential Degradation Mechanisms

Technique	EPRI ETSS	Degradation Mechanism
Bobbin	96004.1 (Rev 13)	Wear at AVB supports, support plates & FDB
Bobbin	27091.2 (Rev 0)	Loose part volumetric wear, part not present
Bobbin	27091.3 (Rev 1)	Loose part volumetric wear, part not present
+Pt	10908.4 (Rev 1)	Wear at AVB locations
+Pt	21998.1 (Rev 4)	Freespan Volumetric
+Pt	27901.1 – 27907.1 (Rev 1)	Freespan Volumetric
+Pt	96910.1 (Rev 10)	Wear at supports and PLP wear part present
Array	20200.1 (Rev 5)	OD Circ indications (ODSCC) at TTS and Expansion Transitions

d) Service Induced Indications

There were no service induced indications detected during 3R17

e) Number of Tubes Plugged by Mechanism for 3R17

No tubes were plugged during 3R17

f) Tubes Plugged to Date

	SG 31	SG 32	SG 33	SG 34	Total
Total Number of Tubes	3214	3214	3214	3214	12856
Tubes Plugged Pre-Service	0	0	0	2	2
Tubes Plugged in Prior Outages	3	6	3	2	14
Tubes Plugged in 3R17	0	0	0	0	0
Total Tubes Plugged to Date	3	6	3	4	16
% of Tubes Plugged to Date	0.09%	0.19%	0.09%	0.12%	0.12%

g) Condition Monitoring Results

No tubes were found with newly-formed degradation. There are eight small volumetric indications, created in 2001 as a result of sludge lance rail wear, that are still present, unchanged. The eight indications did not exceed condition monitoring limits. There was no detectable SG primary-to-secondary leakage during the previous operating period. Therefore, all of the steam generator performance criteria were met for the three previous operating cycles. Because the tube degradation found was sized less than the condition monitoring limit, in situ pressure testing was neither required nor performed. No tube pulls were performed. Tube plug and primary bowl drain inspections had no findings. Secondary side inspections were performed with all results nominal.

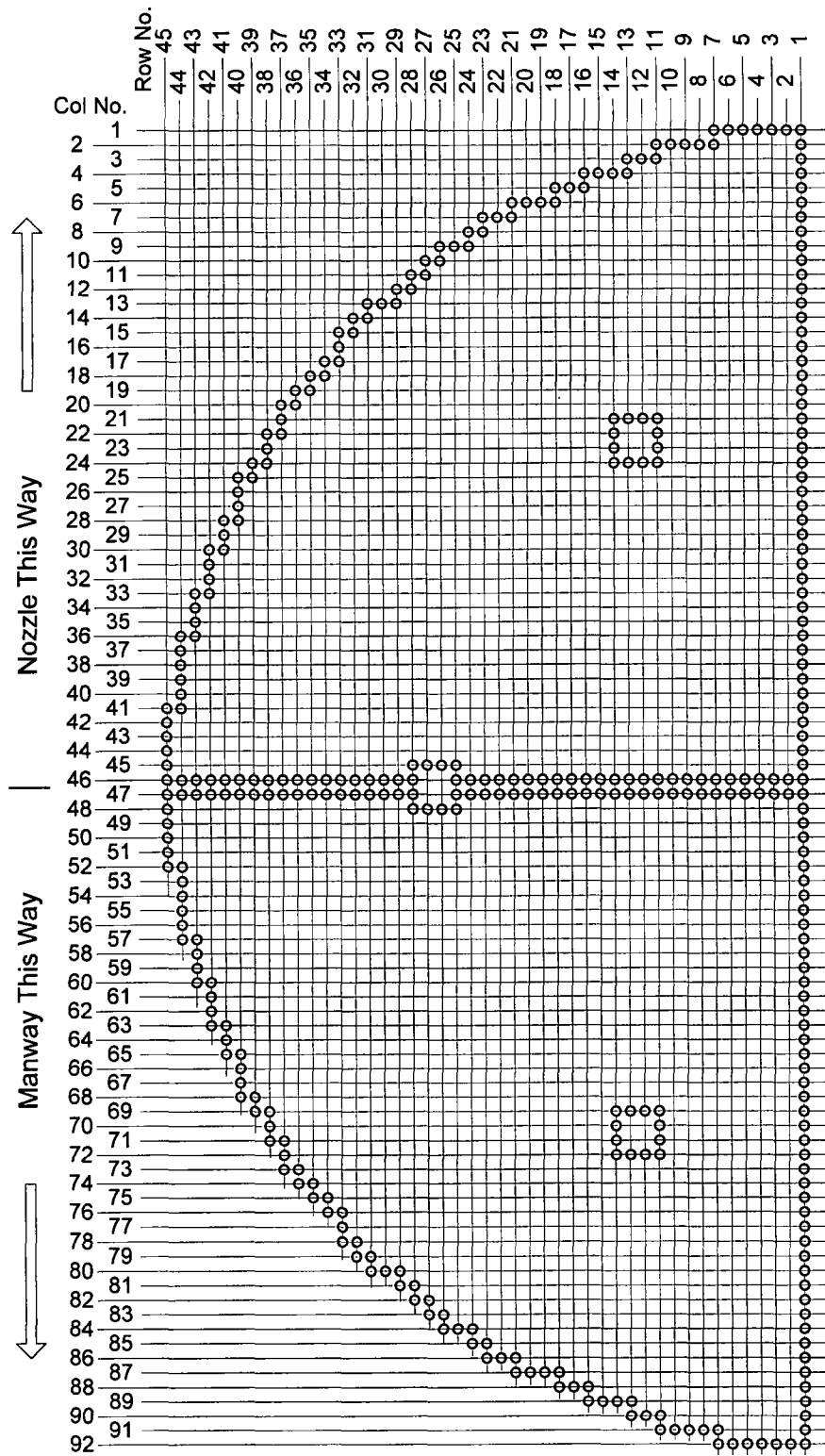
h) Effective Plugging Percentage

Since there are no sleeves installed, the effective tube plugging is equivalent to the percentage of tubes plugged.

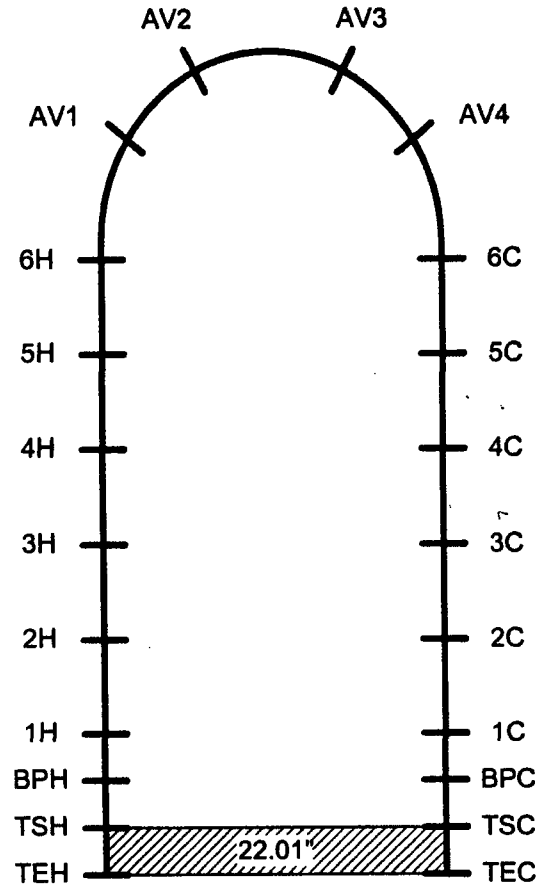
4.0 Attachments

- a) SG Tubesheet Map
- b) SG Landmark Information

Indian Point 3 Steam Generator Tubesheet Map



Indian Point Steam Generator Location Landmarks



Westinghouse Model 44F
Steam Generator

Legend

- AV = Anti-Vibration Bar (AVB)
- C = cold leg
- H = hot leg
- # = support plate (TSP)
- BP = baffle plate (FDB)
- TS = tubesheet
- TE = tube end