

ATTACHMENT II

IPN-89-062

Preservice Examination Report
For Replacement Steam Generators

NEWYORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

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**PRESERVICE EXAMINATION REPORT
STEAM GENERATOR REPLACEMENT**

OF THE

**INDIAN POINT UNIT NO. 3 NUCLEAR POWER PLANT
P. O. BOX 215
BUCHANAN, NEW YORK 10511**

FOR

**NEW YORK POWER AUTHORITY
123 MAIN STREET
WHITE PLAINS, NEW YORK 10601**

**COMMERCIAL SERVICE DATE: AUGUST 30, 1976
OPERATING CAPACITY : 965 MWe
REPORT DATE : DECEMBER, 1988**

PREPARED BY:

**WESTINGHOUSE ELECTRIC CORPORATION
NUCLEAR SERVICES DIVISION
INSPECTION SERVICE
P. O. BOX 355
PITTSBURGH, PENNSYLVANIA 15230-0355**

**FORM NIS-1, OWNER'S DATA REPORT
FOR PRESERVICE INSPECTIONS
AS REQUIRED BY THE PROVISIONS OF THE ASME CODE RULES**

1. OWNER - NEW YORK POWER AUTHORITY, 123 MAIN STREET, WHITE PLAINS, NEW YORK 10601
2. PLANT - INDIAN POINT, P.O. BOX 215, BROADWAY AND BLEAKLEY, BUCHANAN, NEW YORK 10511
3. PLANT UNIT - No. 3
4. OWNER CERTIFICATE OF AUTHORIZATION - N/A
5. COMMERCIAL SERVICE DATE - AUGUST 30, 1976
6. NATIONAL BOARD NUMBER FOR UNIT - N/A
7. COMPONENTS INSPECTED -

<u>COMPONENT OR APPURTENANCE</u>	<u>MANUFACTURER OR INSTALLER</u>	<u>MANUFACTURER OR INSTALLER SERIAL NO.</u>	<u>STATE OR PROVINCE NO.</u>	<u>NATIONAL BOARD NO.</u>
Replacement Steam Generator 31	Westinghouse NCD	11465	--	41
Replacement Steam Generator 32	Westinghouse NCD	11466	--	42
Replacement Steam Generator 33	Westinghouse NCD	11467	--	43
Replacement Steam Generator 34	Westinghouse NCD	11468	--	44

FORM NIS-1 (back)

- 8. Examination Dates 11-7-88 to 12-8-88
- 9. Inspection Interval from 8-30-86 to 8-30-96
- 10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval. Reference Tab C
- 11. Abstract of Conditions Noted Reference Tab B and Tab F
- 12. Abstract of Corrective Measures Recommended and Taken Reference Tab B and Tab F

We certify that the statements made in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Date AUGUST 9 19 89 Signed New York Power Authority
Owner [Signature]

Certificate of Authorization No. (if applicable) _____ Expiration Date _____

CERTIFICATE OF PRESERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of TENN and employed by HSBIBICO of HARTFORD CT have inspected the components described in this Owners Data Report during the period 11-7-88 to 12-8-88, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owners Data Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owners Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date AUGUST 16 19 89

[Signature]
Inspectors Signature

Commission TN 2501 NB 7878
National Board, State, Province and No.

**New York Power Authority
Replacement Steam Generators
for
Indian Point Unit No. 3 Nuclear Power Plant
Examination Summary**

Introduction

Westinghouse Nuclear Service - Inspection Services performed Preservice Examinations on the New York Power Authority Replacement Steam Generators for Indian Point Unit No. 3 Nuclear Power Plant from November 7, 1988 thru December 8, 1988 at the Westinghouse Nuclear Component Division, Pensacola, Florida. The Westinghouse Nuclear Service - Eddy Current Program and Report is located separate from this report and has been submitted to New York Power Authority.

The proposed planned scope sign-off form (located under Tab C) was performed as listed in the Final Program Plan (Reference Tab C).

Examinations

Examinations were performed to meet ASME Boiler and Pressure Vessel Code Section XI - 1983 Edition up to and including Summer 1983 Addenda. Additionally the examination program was expanded to include 100% of all IWC-2500-1 requirements in the 4 Replacement Steam Generators in lieu of utilizing the multiple stream concept.

Examination procedures and certification documentation of examiners, equipment and materials were reviewed and approved prior to the start of examinations.

Examinations and related activities were witnessed by New York Power Authority Quality Assurance Department and Hartford Steam Boiler Insurance and Inspection Agency.

Results

Examinations resulted in the following indications being recorded based on procedure recording criteria.

1. Five (5) ultrasonic indications were recorded utilizing 45° and 60° angles. Three (3) indications were classified as spot reflectors and were acceptable by ASME Boiler and Pressure Vessel Code - Section XI - 1983 Edition up to and including Summer 1983 Addenda. One (1) indication was classified as a reflector that required dimensioning to Section XI standards and was determined to be within the ASME Boiler and Pressure Vessel Code Allowable Limits per Section XI - 1983 Edition up to and including Summer 1983 Addenda Table IWB-3511-1.

One (1) indication was classified as a reflector that required dimensioning to Section XI standards and was determined to be outside the ASME Boiler and Pressure Vessel Code Allowable Limits per Section XI - 1983 Edition up to and including Summer 1983 Addenda Table IWB-3512-1. Further investigation utilizing radiography and Section XI requirements determined that the indication was acceptable. No future monitoring of this indication will be required in excess of normal ASME Section XI scheduling.

2. Liquid Penetrant examinations resulted in indications being noted on the safe end weld of Steam Generator 32. These indications were removed, the weld re-examined and found acceptable per procedure requirements.

Reference Tab F for results and dispositioning of all recordable indications noted.

**PRESERVICE EXAMINATION PROGRAM
STEAM GENERATOR REPLACEMENT
FOR
NEW YORK POWER AUTHORITY
INDIAN POINT UNIT NO. 3**

This document details the proposed planned scope of examination by Westinghouse NSID - Inspection Service - for the Steam Generator Replacement Program, including items and areas selected for examination and documentation procedures and sketches containing identification of all areas to be examined.

Certifications of examiners, materials and equipment will be available on site prior to the start of examinations.

This program and the procedures incorporated herein require approval of New York Power Authority and the Authorized Inspector prior to the start of examinations.

Prepared By: Westinghouse Nuclear Service Integration Division

W Approval: Phillip C. Bukes 10-10-88
Coordinator Date

New York Power Authority Approval: J. M. Hill 10/7/88
Date

Title: NSID - Steam Generator Replacement

Authorized Inspector Review: P. A. Young PAUL H. BIRILL
Date

Agency: INDIAN POINT STEAM GENERATOR I-1 G

**NEW YORK POWER AUTHORITY
INDIAN POINT UNIT NO. 3
REPLACEMENT STEAM GENERATORS 31, 32, 33 & 34
PRESERVICE EXAMINATION**

All items listed below were examined, at the Westinghouse Pensacola Facility after the Steam Generators had successfully passed the Shop Hydrostatic Tests, as indicated in accordance with ASME Boiler and Pressure Vessel Code Section XI - 1983 Edition up to and including Summer 1983 Addenda and Indian Point Unit No. 3 Plant Technical Specification to the extent practical with the access available and the limitations of component geometry.

Program Item	IWB-2500-1 Reference	Area to be Examined	Examination Procedure			Sketch Reference
			Vol.	Surf.	Vis	
<u>Steam Generators 31, 32, 33 and 34</u>						
1.	B2.31	Circumferential Head Welds	(1)	--	--	1-3101
2.	B2.32	Meridional Head Welds	(1)	--	--	1-3101
3.	B2.40	Channel Head to Tubesheet Welds 31-1, 32-1, 33-1 and 34-1	47 ⁽⁷⁾	--	--	1-3101
4.	B3.130	Nozzle to Vessel Welds	(1)	--	--	1-3101
5.	B3.140	Nozzle Inside Radius Section 31-1A, 31-1B, 32-1A, 32-1B, 33-1A, 33-1B, 34-1A and 34-1B	248 ⁽⁷⁾	--	--	1-3101
6.	B5.70	Nozzle to Safe End Butt Welds 31-5DM, 31-6DM, 32-5DM, 32-6DM, 33-5DM, 33-6DM, 34-5DM and 34-6DM	(2)	11 ⁽⁷⁾	--	1-3101
7.	B5.80	Nozzle to Safe End Butt Welds less than 4 in. Nominal Pipe Size	--	(1)	--	1-3101
8.	B5.90	Nozzle to Safe End Socket Welds	--	(1)	--	1-3101

Program Item	IWB-2500-1 Reference	Area to be Examined	Examination Procedure			Sketch Reference
			Vol.	Surf.	Vis	
9.	B6.90	Bolts and Studs	(1)	--	--	1-3101
10.	B6.100	Flange Surface, when connection disassembled	--	--	(1)	1-3101
11.	B6.110	Nuts, Bushings and Washers	--	--	(1)	1-3101
12.	B7.30	Manway Studs & Nuts - 128 Studs, 128 Nuts and 256 Washers	--	--	8	1-3101
13.	B8.30	Integrally Welded Attachments	--	(1)	--	1-3101
14.	B15.30	Pressure Retaining Boundary	--	--	(3)	1-3101
15.	B15.31	Pressure Retaining Boundary	--	--	(4)	1-3101

Program Item	IWC-2500-1 Reference	Area to be Examined	Examination Procedure			Sketch Reference
			Vol.	Surf.	Vis	
Steam Generators 31, 32, 33 & 34						
16.	C1.10	Shell Circumferential Weld 31-3, 32-3, 33-3 and 34-3	47 ⁽⁷⁾	--	--	2-1101
17.	C1.10	Shell Circumferential Weld 31-5, 32-5, 33-5 and 34-5	47 ⁽⁷⁾	--	--	2-1101
18.	C1.10	Shell Circumferential Weld 31-6, 32-6, 33-6 and 34-6	47 ⁽⁷⁾	--	--	2-1101
19.	C1.20	Head Circumferential Weld 31-8, 32-8, 33-8 and 34-8	47 ⁽⁷⁾	--	--	2-1101
20.	C1.30	Tubesheet to Shell Weld 31-2, 32-2, 33-2 and 34-2	47 ⁽⁷⁾	--	--	2-1101
21.	C2.21	Feedwater Nozzle to Shell Weld 31-9, 32-9 33-9 and 34-9	47 ⁽⁷⁾	70 ⁽⁷⁾	--	2-1101
22.	C2.21	Mainsteam Nozzle to Head Weld 31-10, 32-10, 33-10 and 34-10	47 ⁽⁷⁾	70 ⁽⁷⁾	--	2-1101
23.	C2.22	Feedwater Nozzle Inside Radius Section 31-9IR, 32-9IR, 33-9IR and 34-9IR	247 ⁽⁷⁾	--	--	2-1101

Program Item	IWC-2500-1 Reference	Area to be Examined	Examination Procedure			Sketch Reference
			Vol.	Surf.	Vis	
<u>Steam Generators 31, 32, 33 & 34 (Cont'd)</u>						
24.	C2.22	Mainsteam Nozzle Inside Radius Section 31-10IR, 32-10IR, 33-10IR and 34-10IR	(6)	--	--	2-1101
25.	C3.10	Integrally Welded Attachments	--	(1)	--	2-1101
26.	C4.10	Bolts & Studs	(5)	--	--	2-1101
27.	C7.10	Pressure Retaining Components	--	--	(3)	2-1101
28.	C7.20	Pressure Retaining Components	--	--	(4)	2-1101

Notes:

- (1) There are no items in this category on the Steam Generators
- (2) ASME Boiler and Pressure Vessel Code Section XI - 1983 Edition thru Summer 1983 Addenda required volumetric examination volume of Nozzle to Safe End Butt Welds not examinable due to geometric configuration (i.e., limited weld width). Ultrasonic examinations will be performed under a separate contract by a New York Power Authority approved vendor following on site installation of Replacement Steam Generators and welding of Reactor Coolant Pipe to Replacement Steam Generators Nozzle to Safe End Butt Welds.
- (3) Code item not applicable for Preservice Examination.
- (4) Examination performed by Westinghouse NCD - Pensacola.
- (5) Component item does not meet Code requirement size for examination in this category.
- (6) Relief is requested from volumetric examination due to Mainsteam Nozzle configuration.
- (7) Volumetric and/or surface examination of 100% of Code required area may be limited due to geometry, weld configuration, manways, welded pads, etc. Volumetric and or Surface examination as required by ASME Boiler and Pressure Vessel Code Section XI - 1983 Edition thru Summer 1983 Addenda will be performed to the maximum extent possible. Where limitations restrict examination of 100% code required area the limitation will be documented on the data sheet for the weld examined and a Limitation to Examination Form describing approximate size, location and type of limitation.

PRESERVICE EXAMINATION PROGRAM
OF THE
REPLACEMENT STEAM GENERATORS
FOR
NEW YORK POWER AUTHORITY
INDIAN POINT UNIT NO. 3
BY WESTINGHOUSE NSID - INSPECTION SERVICES
TO
ASME BOILER AND PRESSURE VESSEL CODE
SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
IWB-2500-1
and
IWC-2500-1

Reference	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
B2.40	Channel Head Tubesheet Welds	31-1, 32-1, 33-1 and 34-1	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-47	Manual Ultrasonic Examination of Welds in Vessels for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3
B3.140	Nozzle Inside Radius Section	31-1A, 31-1B, 32-1A, 32-1B, 33-1A, 33-1B, 34-1A and 34-1B	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-248	Manual Ultrasonic Examination of Steam Generator Primary Nozzle Inside Radius Corner for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3

PRESERVICE EXAMINATION PROGRAM
 OF THE
 REPLACEMENT STEAM GENERATORS
 FOR
 NEW YORK POWER AUTHORITY
 INDIAN POINT UNIT NO. 3
 BY WESTINGHOUSE NSID - INSPECTION SERVICES
 TO
 ASME BOILER AND PRESSURE VESSEL CODE
 SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
 IWB-2500-1
 and
 IWC-2500-1

Ref- er- ence	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
C2.21	Mainsteam and Feedwater Nozzle to Shell Welds	31-9, 31-10, 32-9, 32-10, 33-9, 33-10, 34-9, 34-10	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-47	Manual Ultrasonic Examination of Welds in Vessels for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3
C2.21	Mainsteam and Feedwater Nozzle to Shell Weld	31-9, 31-10, 32-9, 32-10, 33-9, 33-10, 34-9, 34-10	Pensacola, Florida	No	Magnetic Particle (Surface)	Magna- flux Y-6 Yoke	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-70	Magnetic Particle Examination for Indian Point No. 3

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ASME BOILER AND PRESSURE VESSEL CODE
SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
IWB-2500-1
and
IWC-2500-1

Reference	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
85.70	Nozzle to Safe End Butt Welds	31-5DM, 31-6DM, 32-5DM, 32-6DM, 33-5DM, 33-6DM, 34-5DM & 34-6DM	Pensacola, Florida	No	Liquid Penetrant (Surface)	Magnaflex Spray	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-11	Liquid Penetrant Examination for Indian Point Unit No. 3
85.70	Nozzle to Safe End Butt Welds	31-5DM, 31-6DM, 32-5DM, 32-6DM, 33-5DM, 33-6DM, 34-5DM & 34-6DM	Indian Point Unit No. 3 Buchanan New York (Following Installation)	No	Ultrasonic (Volumetric) & Liquid Penetrant (Surface)	Sonic Mark 1 Magnaflex Spray	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3
								INT-ISI-206	Manual Ultrasonic Examination of Welds for Indian Point Unit No. 3
								INT-ISI-11	Liquid Penetrant Examination for Indian Point Unit No. 3

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 OF THE
 REPLACEMENT STEAM GENERATORS
 FOR
 NEW YORK POWER AUTHORITY
 INDIAN POINT UNIT NO. 3
 BY WESTINGHOUSE NSID - INSPECTION SERVICES
 TO
 ASME BOILER AND PRESSURE VESSEL CODE
 SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
 IWB-2500-1
 and
 IWC-2500-1

Ref- er- ence	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
C1.20	Head Circum- ferential Welds	31-8, 32-8, 33-8, 34-8	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-47	Manual Ultrasonic Examination of Welds in Vessels for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3
C1.30	Tubesheet to Shell Welds	31-2, 32-2, 33-2, 34-2	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3
								INT-ISI-47	Manual Ultrasonic Examination of Welds in Vessels for Indian Point Unit No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3

PRESERVICE EXAMINATION PROGRAM
 OF THE
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 FOR
 NEW YORK POWER AUTHORITY
 INDIAN POINT UNIT NO. 3
 BY WESTINGHOUSE NSID - INSPECTION SERVICES
 TO
 ASME BOILER AND PRESSURE VESSEL CODE
 SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
 IWB 2500-1
 and
 IWC 2500-1

Ref- er- ence	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title	
B7.30	Manway Studs and Nuts	128 Studs. 128 Nuts and 256 Washers	Pensacola, Florida	No	Visual	Direct Eye	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 3 Visual Examination for Indian Point Unit No. 3	
								INT-ISI-8		
C1.10	Shell Circum- ferential Welds	31-3, 31-5, 31-6, 32-3, 32-5, 32-6, 33-3, 33-5, 33-6, 34-3, 34-5, 34-6	Pensacola, Florida	No	Ultrasonic (Volumetric)	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point Unit No. 2	
								INT-ISI-47		Manual Ultrasonic Examination of Welds in Vessels for Indian Point Unit No. 3
								INT-ISI-10		

PRESERVICE EXAMINATION PROGRAM
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 BY WESTINGHOUSE NSID - INSPECTION SERVICES
 TO
 ASME BOILER AND PRESSURE VESSEL CODE
 SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

Section XI
 IWB-2500-1
 and
 IWC-2500-1

Ref-er-ence	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
C2.22	Mainsteam Nozzle Inside Radius Section	31-10IR, 32-10IR, 33-10IR 34-10IR	Pensacola, Florida	Yes	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
								INT-ISI-8	Visual Examination for Indian Point Unit No. 3
C2.22	Feedwater Nozzle Inside Radius Section	31-9IR 32-9IR 33-9IR 34-9IR	Pensacola, Florida	No	Volumetric	Sonic Mark I	Westinghouse NSID	INT-OPS-101	Preservice and Inservice Documentation for Indian Point No. 3
								INT-ISI-10	Qualification of Ultrasonic Manual Equipment for Indian Point Unit No. 3
								INT-ISI-247	Manual Ultrasonic Examination of Inside Radius of Feedwater Nozzle for Indian Point Unit No. 3

PRESERVICE EXAMINATION PROGRAM
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 INDIAN POINT UNIT NO. 3
 BY WESTINGHOUSE NSID - INSPECTION SERVICES
 TO
 ASME BOILER AND PRESSURE VESSEL CODE
 SECTION XI - 1983 EDITION THRU SUMMER 1983 ADDENDA

ection XI

Ref- er- ence	Area To Be Examined	Item Identification	Location of Examination	Relief Request	Method of Examination	Equipment	Personnel	Procedure No.	Procedure Title
pend. V	Steam Gen. U Tubes	100% of all 4 Steam Generators	Pensacola, Florida	No	ECT	ZETEC MIZ-18A	Westinghouse NSD	MRS 2.4.2 Gen.28 (Procedure covers Profilometry, if necessary)	Digital Multi-Frequency (Eddy Current Inspection of Preservice or Inservice Heat Exchanger Tubing)

PRESERVICE EXAMINATION

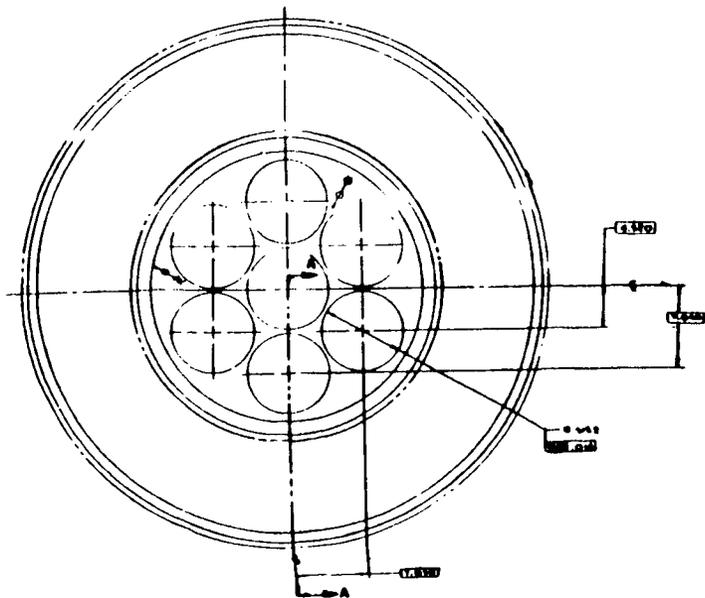
RELIEF REQUEST

1. COMPONENT: Steam Generators Steam Outlet Nozzle
2. CODE REFERENCE: Asme Boiler and Pressure Vessel Code
Section XI 1983 Edition thru Summer 1983
Addenda IWC-2500-1 Category C-B Item C2.22
3. CODE REQUIRED EXAMINATION: Volumetric Examination of 1 Mainsteam
Nozzle Inside Radius Section (IWC-2500-1
Category C-B Item C2.22)
4. ALTERNATE EXAMINATION: The steam outlet nozzle should be
excluded from the requirements for
reasons outlined below. The nozzle areas
will be examined for evidence of leakage
during Section III shop hydrostatic test
and the subsequent preservice Section XI
hydrostatic test following installation
of the steam generators as required by
ASME Boiler Pressure Vessel Code.
5. BASIS FOR RELIEF REQUEST: The Main Steam Nozzle is welded to the
Steam Generator. Section XI requires
volumetric examination of the inside
radius section of nozzles greater than a
nominal pipe size of 12 inches in Class 2
vessels. In the case of Indian Point No.
3 Steam Generators, due to design, the
Main Steam Nozzles do not have an inner
or blended radius section to examine.
The nozzle is a one piece forging with
seven holes bored parallel to the nozzle
centerline. Inconel flow restrictors are
subsequently installed within each of
these holes and attached to cladding that
is weld deposited onto the bottom surface
of the nozzle. The cladding serves as a
medium of attachment for the inconel flow
restrictors and as an erosion barrier to
protect the nozzle forging. Due to the
Main Steam Nozzle not having an inner
radius blended section to examine, the
Section XI requirements are not
applicable. The I.D. of the Steam Outlet
Nozzle is not accessible for visual
examination due to interference from the
installed steam separator packages on the
inside and the internal geometry of the
nozzle itself precludes access for visual
examination from the outside.

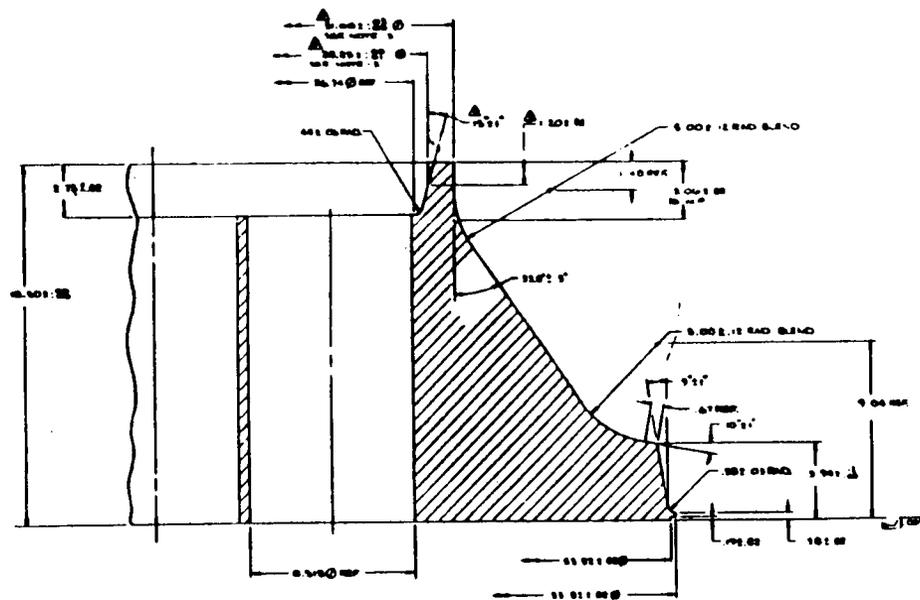
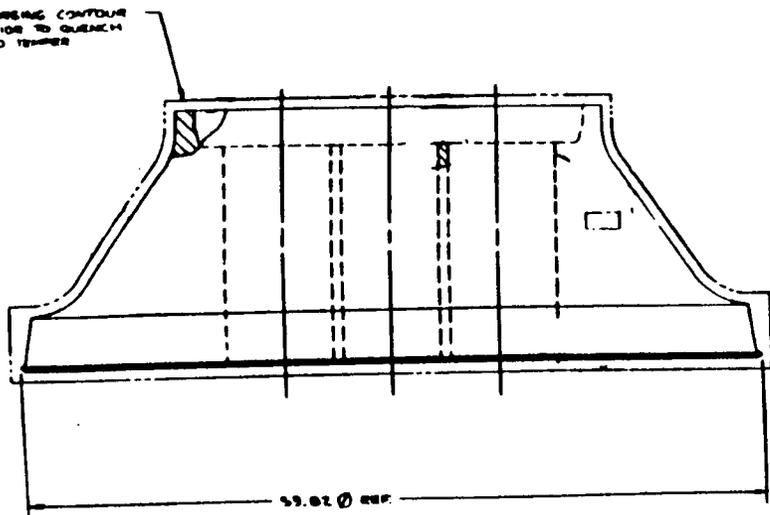
Examinations performed to Section III on the steam outlet nozzle include the following: 100% Ultrasonic inspection of the nozzle forging prior to final machining followed by magnetic particle and visual inspection after final machining. Examinations performed on the weld deposited cladding in the area beneath the bored hole corners include ultrasonic (for bond and defect), liquid penetrant and visual examination. Upon attachment of the flow restrictors the welds are liquid penetrant and visually examined.

GENERAL

There is no change expected in the overall level of plant safety after installation of the steam generators by performing the proposed alternate examinations. The alternate inspections identified herein will augment the original plant design and fabrication requirements which did not require the volumetric examination of nozzle inside radius sections.



FORGING CONTOUR
PRIOR TO QUENCH
AND TEMPER



STEAM OUTLET NOZZLE FORGING
PRIOR TO CLADDING AND
FLOW RESTRICTOR INSTALLATION

DCR # 194711
C P A

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 4, 1989



Docket No. 50-286

Mr. John C. Brons
Executive Vice President, Nuclear Generation
Power Authority of the State of New York
123 Main Street
White Plains, New York 10601

Dear Mr. Brons:

SUBJECT: INDIAN POINT 3 RELIEF REQUEST (TAC 69190)

By letter dated August 12, 1988, you requested relief from volumetric examination of the replacement steam generator nozzle inner radius sections as required by Section XI of the ASME Code. The letter requested relief for the steam outlet and channel head primary nozzle inner radius sections.

Following discussions with the staff of the preservice examination requirements, you withdrew the request for the channel head primary nozzles by letter dated January 9, 1989. You determined that the examination of the channel head primary nozzles could be performed.

We have reviewed your relief request for the steam generator nozzle inner radius sections and conclude that relief is not required. The basis for our conclusion is given in the enclosed Safety Evaluation.

Sincerely,

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects I/II

Enclosures:
Safety Evaluation

cc: w/enclosure:
See next page

89-0417-0257 3pp

Mr. John C. Brons
Power Authority of the State
of New York

Indian Point Nuclear Generating
Unit No. 3

cc:

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Resident Inspector
Indian Point Nuclear Generating
U.S. Nuclear Regulatory Commission
Post Office Box 337
Buchanan, New York 10511

Mr. Gerald C. Goldstein
Assistant General Counsel
Power Authority of the State
of New York
10 Columbus Circle
New York, New York 10019

Mr. Robert L. Spring
Nuclear Licensing Engineer
Consolidated Edison Company
of New York, Inc.
4 Irving Place
New York, New York 10003

Mr. Phillip Bayne, President
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Mr. A. Klausmann, Vice President
Quality Assurance
Power Authority of the State
of New York
10 Columbus Circle
New York, New York 10019

Mr. William Josiger
Resident Manager
Indian Point 3 Nuclear Power Plant
Post Office Box 215
Buchanan, New York 10511

Mayor, Village of Buchanan
236 Tate Avenue
Buchanan, New York 10511

Mr. George M. Wilverding, Manager
Nuclear Safety Evaluation
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Mr. F. X. Pindar
Quality Assurance Superintendent
Indian Point 3 Nuclear Power Plant
Post Office Box 215
Buchanan, New York 10511

Director, Technical Development
Programs
State of New York Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Mr. R. Beedle, Vice President
Nuclear Support
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Power Authority of the State
of New York

- 2 -

Indian Point 3

cc

Mr. Peter Kokolakis, Director
Nuclear Licensing
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Ms. Donna Ross
New York State Energy Office
2 Empire State Plaza
16th Floor
Albany, New York 12223

Mr. S. S. Zulla, Vice President
Nuclear Engineering
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Vice President
Nuclear Operations
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Charlie Donaldson, Esquire
Assistant Attorney General
New York Department of Law
120 Broadway
New York, New York 10271

**SAFETY EVALUATION OF A REQUEST FOR RELIEF FROM EXAMINATION
REQUIREMENTS FOR STEAM GENERATOR STEAM OUTLET NOZZLES**

POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286

I. BACKGROUND INFORMATION

The Technical Specifications for Indian Point 3 Nuclear Power Plant state, in part, that components of the facility that are classified as ASME Code Class 1, 2, and 3 shall be examined in accordance with the requirements of applicable editions and addenda of Section XI except where specific written relief from those requirements has been granted by the Commission. By letter dated August 12, 1988, the Power Authority of the State of New York (licensee) requested, pursuant to 10 CFR 50.55a(g), relief from volumetric examination of the replacement steam generators nozzle inner radiused sections as required by the 1983 Edition through Summer 1983 Addenda of Section XI of the ASME Code for the Indian Point 3 facility. Relief from volumetric examination of the steam outlet and channel head primary nozzles inner radiused sections was requested with supporting information provided. Following discussions with the licensee regarding the determination that the examination of the channel head primary nozzles is impractical to perform and the licensee's reevaluation of the available ultrasonic methods and techniques, the request concerning the channel head primary nozzles was withdrawn by letter dated January 9, 1989. The relief request and supporting information for the steam generator steam outlet nozzles were resubmitted in the attachment to the letter. This information has been reviewed by the staff with the conclusion drawn that relief from the volumetric examination requirement is not necessary. The information, requirements, and basis for the conclusion are given in this safety evaluation.

II. RELIEF REQUEST, REQUIREMENTS, AND SUPPORTING INFORMATION

A. RELIEF REQUEST - Relief is requested from the volumetric examination requirement for the steam generators steam outlet nozzle inside radiused sections.

B. SECTION XI EXAMINATION REQUIREMENT

Volumetric Examination of each steam generator main steam nozzle inside radius section is required by the ASME Boiler and Pressure Vessel Code, Section XI 1983 Edition through Summer 1983 Addenda IWC-2500-1 Category C-B Item C2.22.

C. LICENSEE'S BASIS FOR REQUESTING RELIEF

Presently, there is no comprehensive inspection technique available, nor guidance for such in the ASME Code, which would provide a conclusive assessment of the Code required volumes of the main steam nozzle inside radius sections.

The main steam nozzle is welded to the steam generator. Section XI requires volumetric examination of the inside radius section of nozzles greater than a nominal pipe size of 12 inches in Class 2 vessels. By design, the main steam nozzles do not have an inner or blended radius section to examine. The nozzle is a one piece forging with seven holes bored parallel to the nozzle centerline (see attached sketch). Inconel flow restrictors are subsequently installed within each of these holes and attached to cladding that is weld deposited onto the bottom surface of the nozzle. The cladding serves as a medium of attachment for the inconel flow restrictors and as an erosion barrier to protect the nozzle forging. Due to the main steam nozzle not having an inner radius blended section to examine, the Section XI examination requirements are not applicable. The I.D. of the steam outlet nozzle is not accessible for visual examination due to interference from the installed steam separator packages on the inside and the internal geometry of the nozzle itself precludes access for visual examination for the outside.

Examinations performed to Section III on the steam outlet nozzle include the following: 100% Ultrasonic inspection of the nozzle forging prior to final machining followed by magnetic particle and visual inspections after final machining. Examinations performed on the weld deposited cladding in the area beneath the bored hole corners include ultrasonic (for bond and defect), liquid penetrant and visual examination. Upon attachment of the flow restrictors the welds are liquid penetrant and visually examined.

D. LICENSEE'S PROPOSED ALTERNATE EXAMINATION

The main steam nozzle areas will be examined for evidence of leakage during Section III shop hydrostatic test and the subsequent preservice Section XI hydrostatic test following installation of the steam generators as required by ASME Boiler Pressure Vessel Code.

III. STAFF EVALUATION AND CONCLUSION

The design of the main steam outlet nozzles does not incorporate the blended radiused area between the nozzle wall and vessel shell as incorporated in the design of nozzles for which the Code examination requirements are applicable. (See attached SKETCH)

The nozzles were designed to contain flow restrictors and were fabricated from forgings with seven holes bored parallel to the nozzle centerline. Since no inside radiused sections exist in the nozzle-to-shell design, the staff finds that relief from the examination requirement is not necessary.

PRINCIPAL CONTRIBUTOR:

G. JOHNSON, MTER

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 74

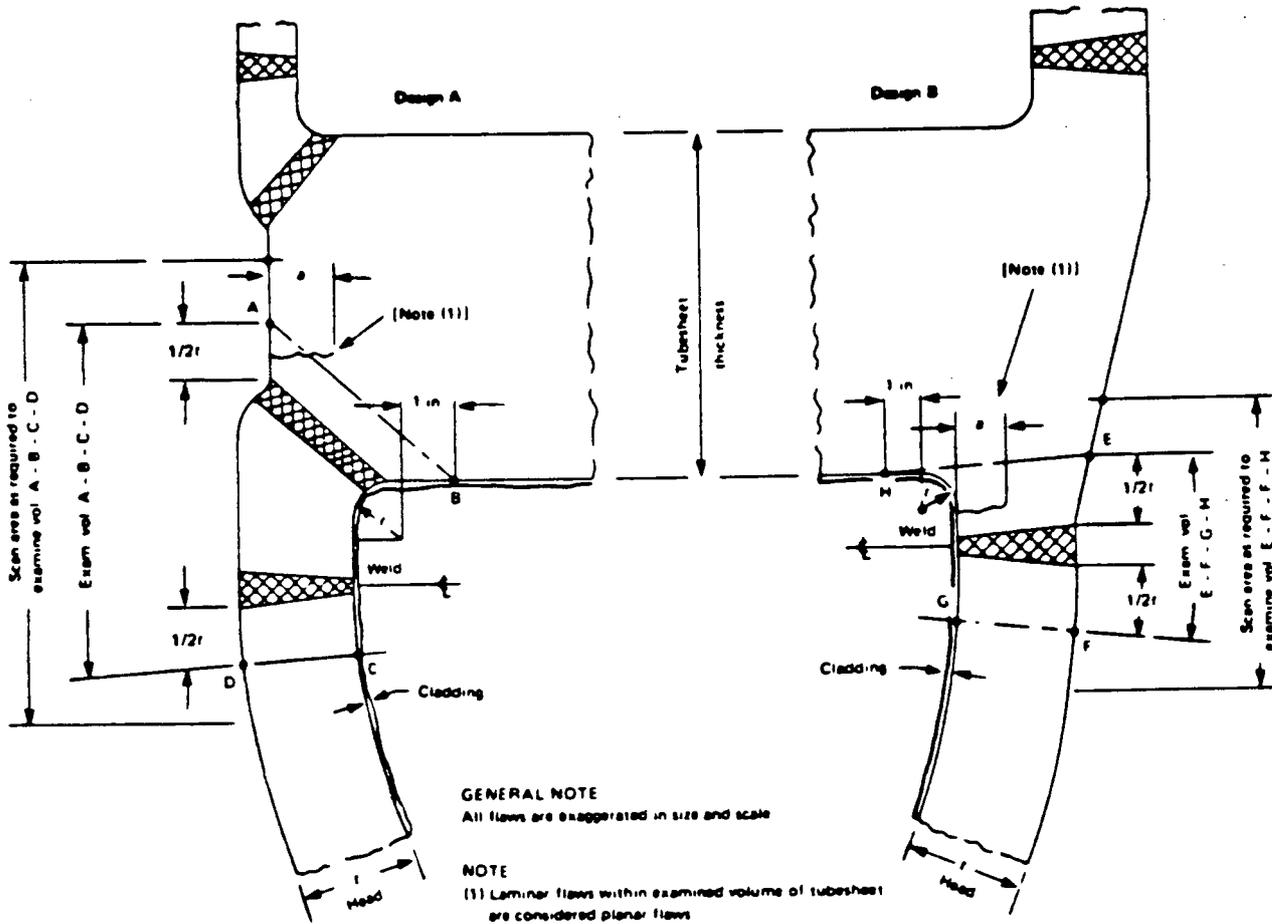


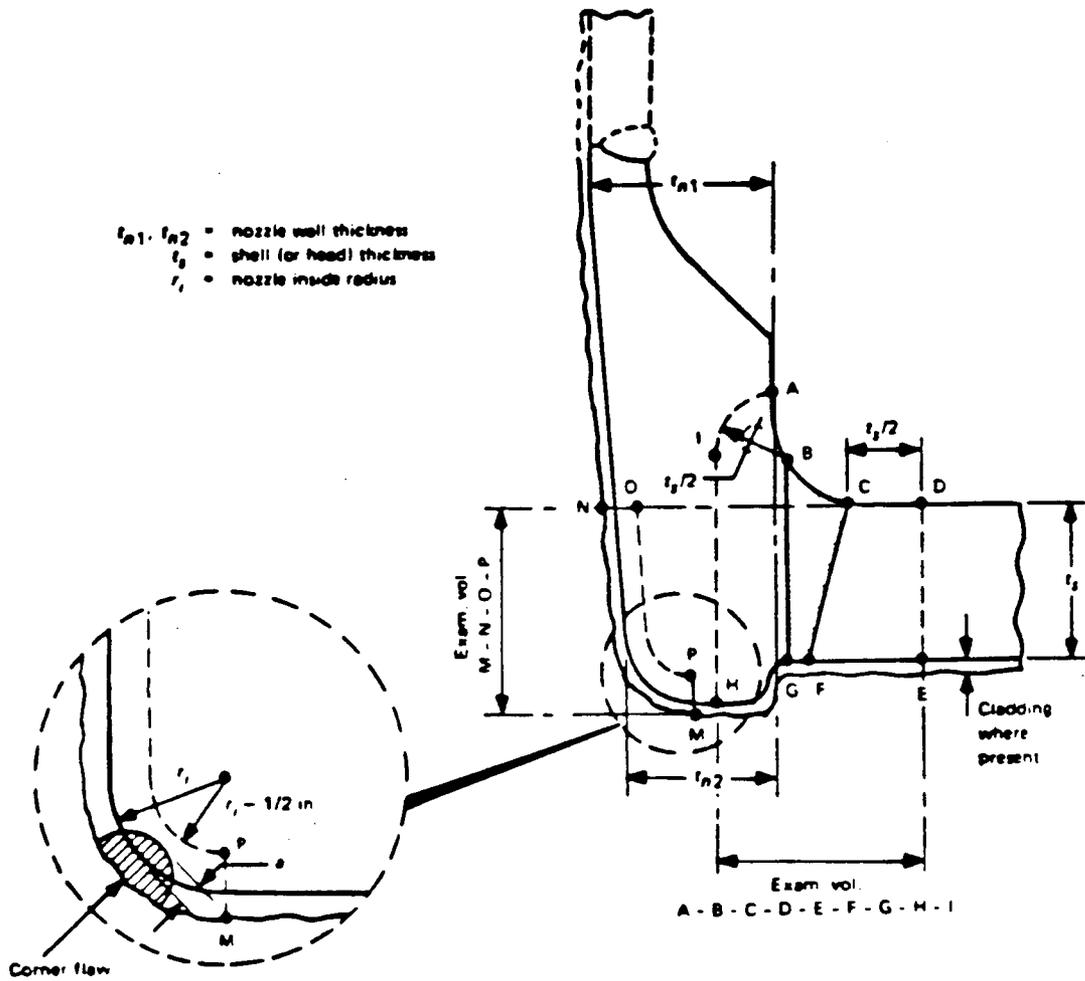
FIG IWB-2500-6 TYPICAL TUBESHEET-TO-HEAD WELD JOINTS

FORM 48446

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 75

FORM 4647



EXAMINATION REGION [Note (1)]

- Shell (or head) adjoining region
- Attachment weld region
- Nozzle cylinder region
- Nozzle inside corner region

EXAMINATION VOLUME [Note (2)]

- C-D-E-F
- B-C-F-G
- A-B-G-H-I
- M-N-O-P

NOTES

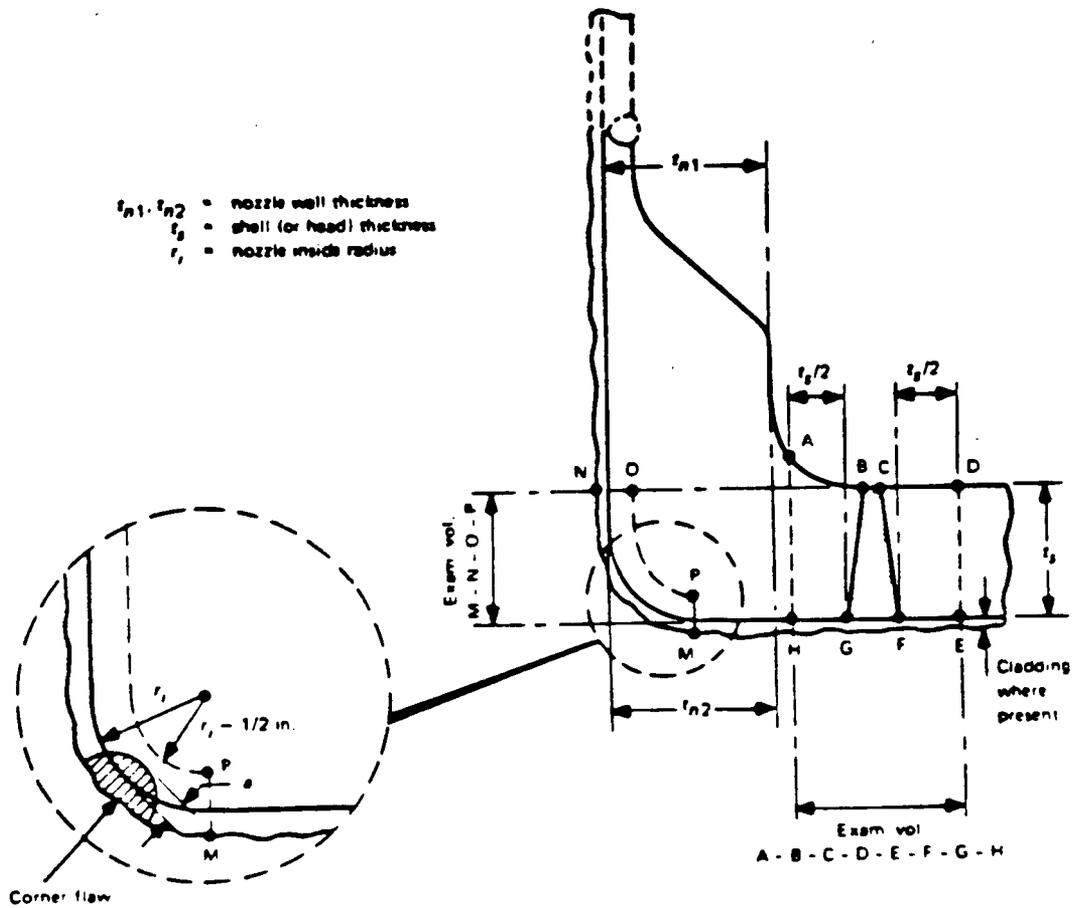
- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB 3512
- (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings

FIG. IWB-2500-7(a) NOZZLE IN SHELL OR HEAD
 (Examination Zones in Barrel Type Nozzles Joined by Full Penetration Corner Welds)

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 76

FORM 48448



EXAMINATION REGION (Note (1))

- Shell (or head) adjoining region
- Attachment weld region
- Nozzle cylinder region
- Nozzle inside corner region

EXAMINATION VOLUME (Note (2))

- C, D, E, F
- B, C, F, G
- A, B, G, H
- M, N, O, P

NOTES

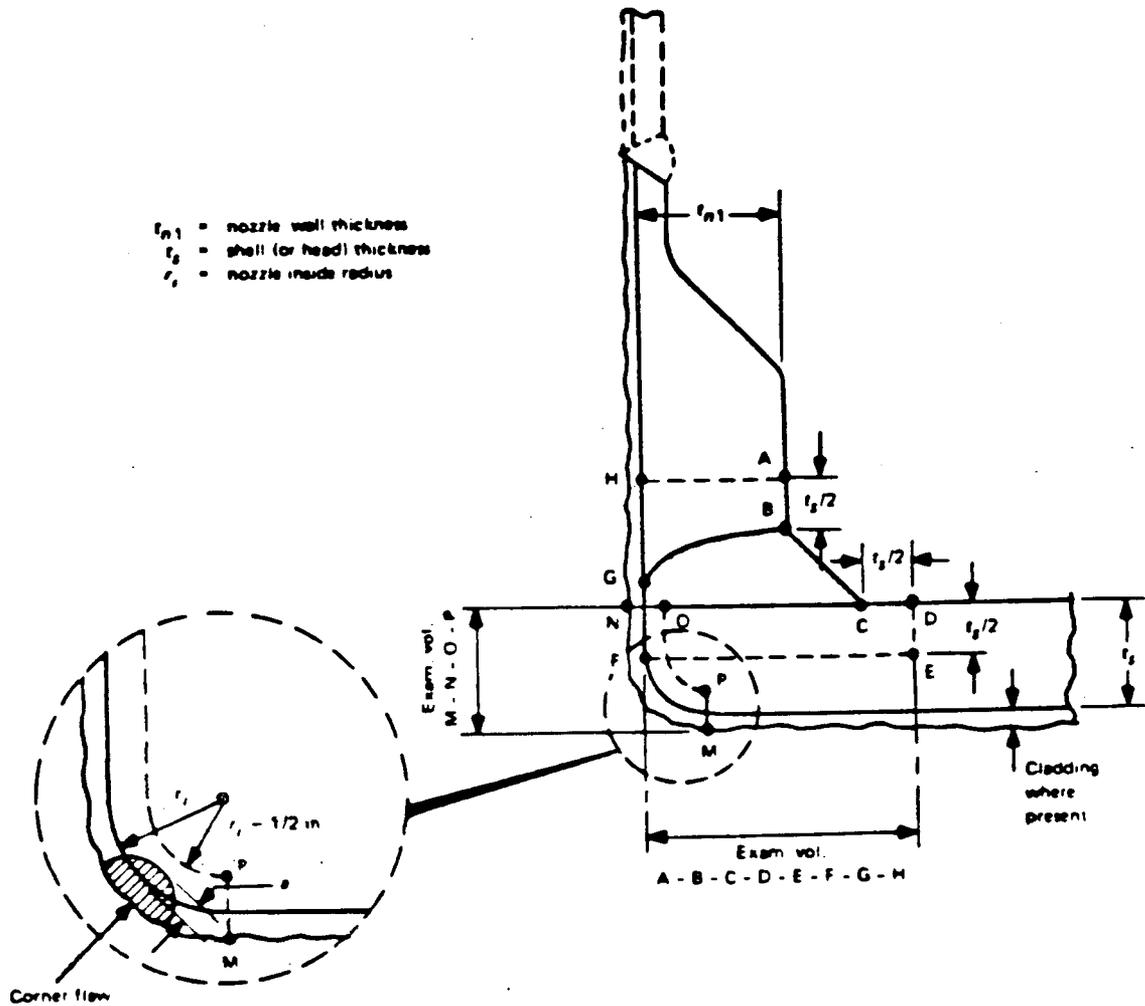
- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB 3512
- (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings

FIG IWB-2500-7(b) NOZZLE IN SHELL OR HEAD
 (Examination Zones in Flange Type Nozzles Joined by Full Penetration Butt Welds)

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 77

FORM 46446



EXAMINATION REGION (Note (1))

- Shell (or head) adjoining region
- Attachment weld region
- Nozzle cylinder region
- Nozzle inside corner region

EXAMINATION VOLUME (Note (2))

- C-D-E-F-G
- B-C-G
- A-B-G-H
- M-N-O-P

NOTES

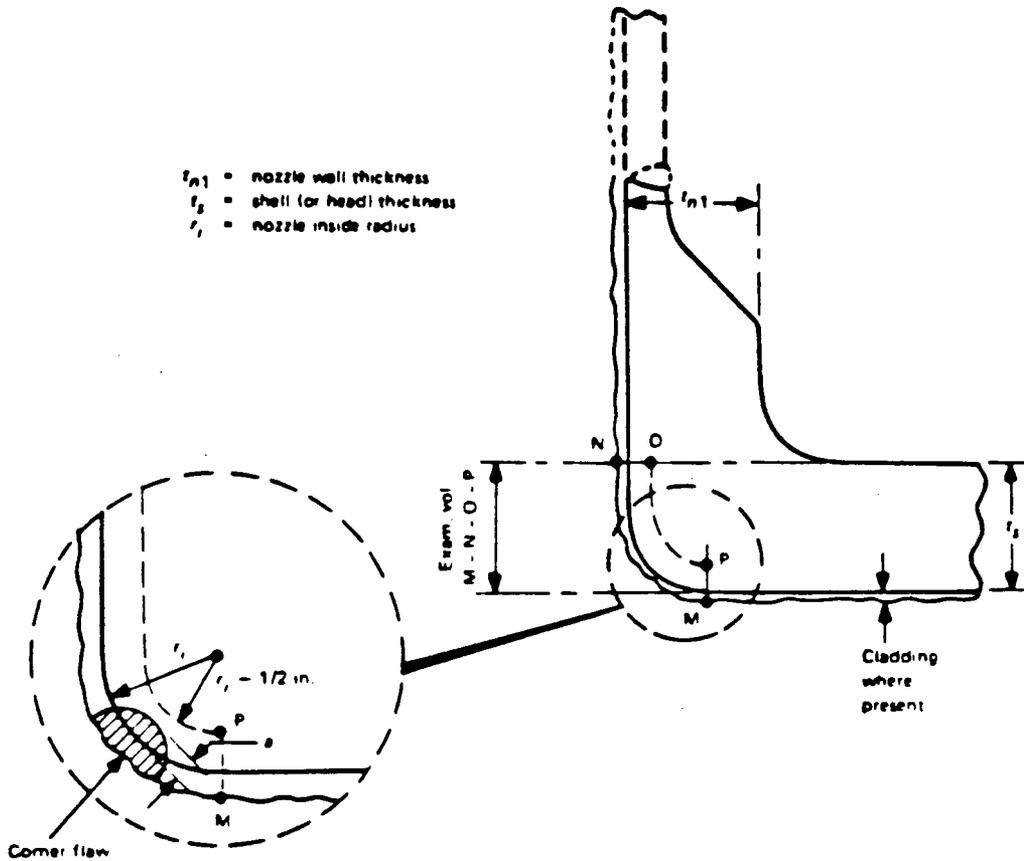
- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB 3512
- (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings

FIG IWB-2500-7(c) NOZZLE IN SHELL OR HEAD
 (Examination Zones in Set-On Type Nozzles Joined by Full Penetration Corner Welds)

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 78

FORM 48446



EXAMINATION REGION (Note (1))
Nozzle inside corner region

EXAMINATION VOLUME (Note (2))
M-N-O-P

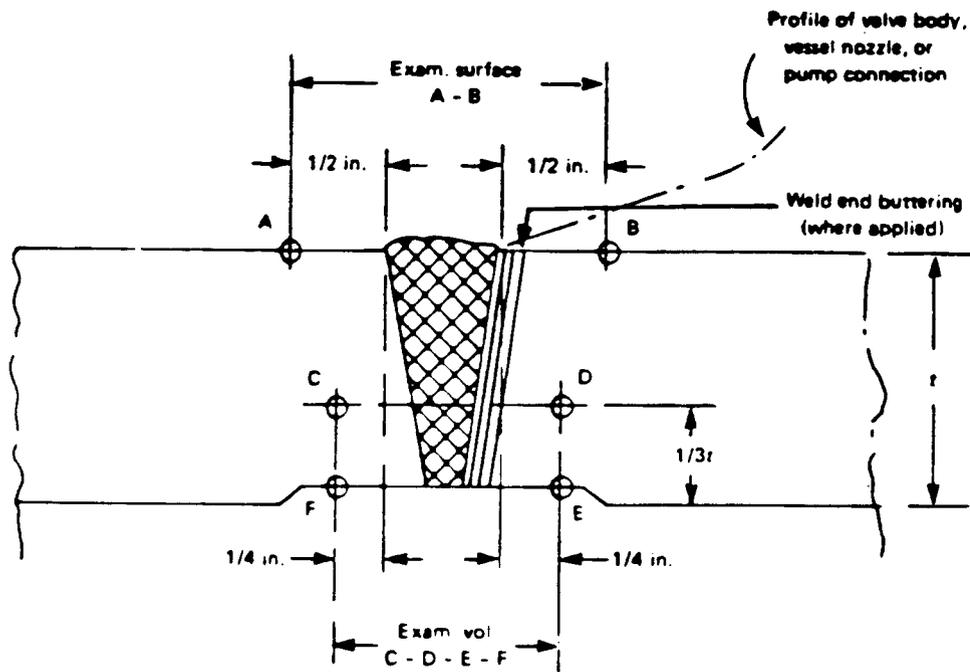
NOTES

- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB 3512
- (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings

FIG. IWB-2500-7(d) NOZZLE IN SHELL OR HEAD
(Examination Zone in Nozzles Integrally Cast or Formed in Shell or Head)

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 80



(c) NPS > 4 in.

FIG. IWB-2500-8 SIMILAR AND DISSIMILAR METAL WELDS IN COMPONENTS AND PIPING (CONT'D)

FORM 4844P

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 132

FORM 4844A

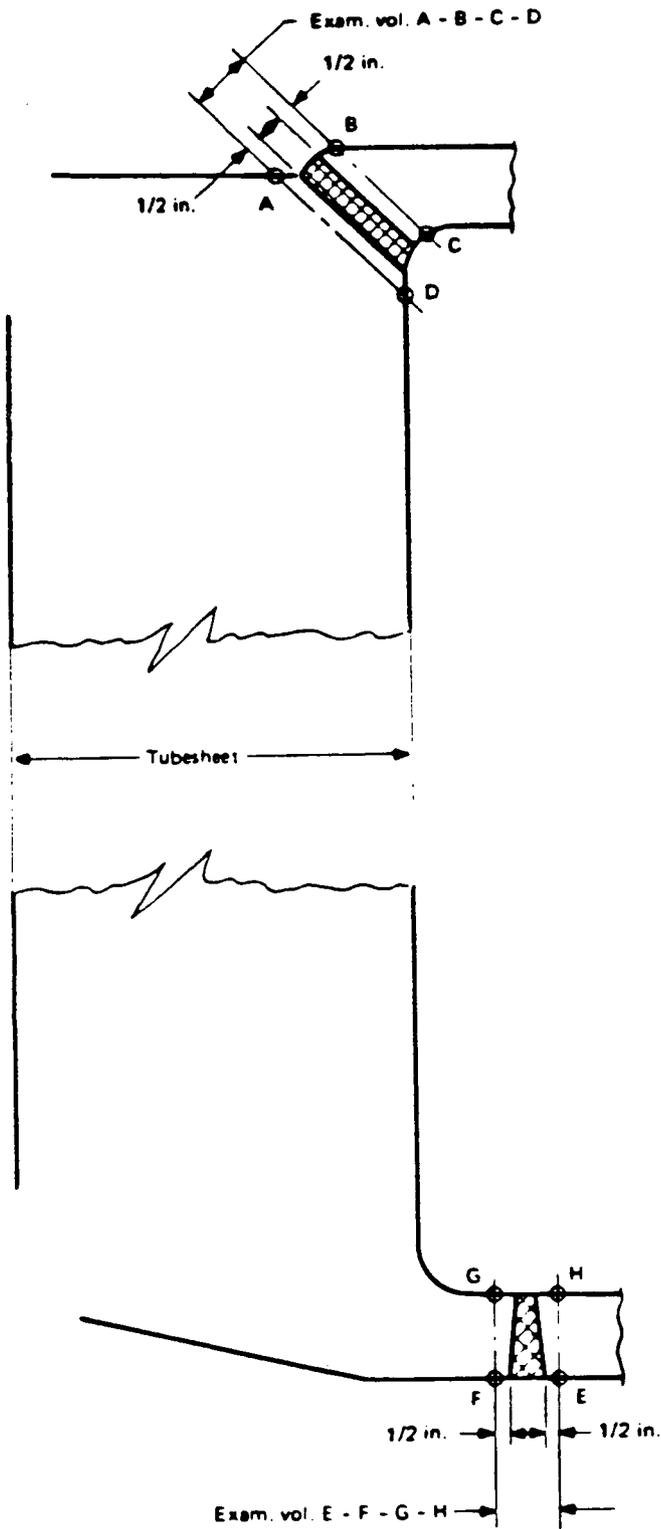
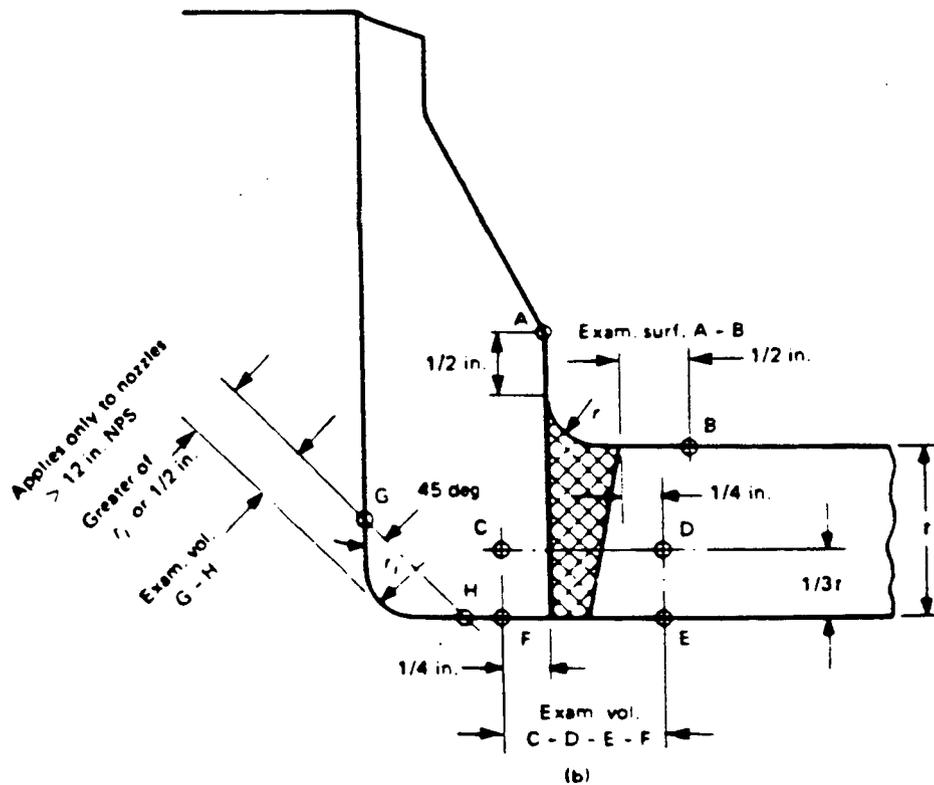
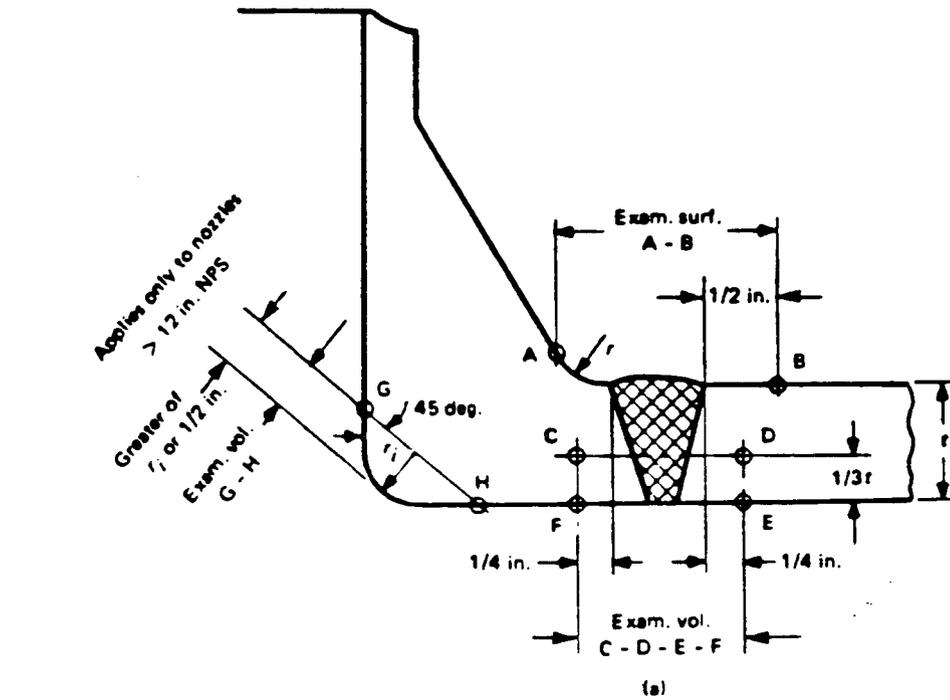


FIG. IWC-2500-2 TYPICAL TUBESHEET-TO-SHELL CIRCUMFERENTIAL WELDS
(Steam Generator Designs)

WESTINGHOUSE ELECTRIC CORPORATION

Reference: Section XI 1983 Edition Page 134

FORM 48446



GENERAL NOTE Nozzle sizes over 4 in. NPS, vessel thickness over 1/2 in.

FIG. IWC-2500-4 NOZZLE-TO-VESSEL WELDS

ATTACHMENT III

IPN-89-062

Summary Of Steam Generator Replacement
And Hydrostatic Tests

NEWYORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64

INDIAN POINT 3 NUCLEAR POWER PLANT
STEAM GENERATOR REPLACEMENT SUMMARY

Introduction

The Indian Point 3 Nuclear Power Plant Westinghouse Model 44 steam generators were replaced with new Westinghouse Model 44F steam generators during the cycle 6/7 refueling outage from February 5, 1989 through June 23, 1989. The replacement was performed by Bechtel Constructors Corporation and in accordance with ANSI B31.1 1986 edition through Summer 1986 addenda code requirements.

The following is a description of the steam generator replacement.

Removal

The method of replacement of the Indian Point 3 steam generators (SG) was one-piece removal and transport through the existing containment equipment hatch.

The basic technique of replacement involved cutting the inlet and outlet reactor coolant piping, main steam, boiler feed and all other attached piping. This replacement method is referred to as the reactor coolant pipe two cut approach. Installation of the replacement steam generators proceeded through the same steps in reverse.

The reactor coolant hot and cold legs were cut at the nozzles using track-mounted plasma arc cutting equipment. Plasma arc cutting of reactor coolant system piping has been successfully performed on previous steam generator repair/replacement projects. The cut location was on the nozzle to allow sufficient material for a finish weld preparation at the original weld location prior to reinstallation.

The existing elbows at the reactor coolant inlet and outlet nozzles were not required to be removed unless an unacceptable alignment between the new SG nozzles and existing reactor coolant piping was experienced during templating. In one case, an existing elbow was removed using plasma arc cutting equipment.

The main steam and boiler feed piping was cut at the nozzles on the upper shell using track-mounted thermal cutting equipment. Sections of the main steam and boiler feed piping were removed by making additional pipe cuts using track-mounted mechanical cutting equipment.

Shield covers were welded on the reactor coolant, main steam and boiler feed nozzles prior to removing the steam generator from containment.

Miscellaneous secondary side piping, such as the blowdown piping, shell drain piping, and level instrument taps were severed using portable cutting equipment. Cuts were made at the steam generator nozzle boss to allow installation of shield plugs.

Installation

Prior to installing the replacement steam generators, weld end preparations were completed on the reactor coolant, main steam and feedwater piping.

Mechanical templates were used to transfer coordinates of the nozzles on the new steam generator channel heads to the existing RCS pipe elbow. I.D. build-up was performed where required to resolve minimum wall concerns. Portable end preparation machines were mounted on the elbow I.D.'s. The elbows were sequentially faced, counterbored and beveled to finished dimensions to obtain code fit-up.

During templating of the existing RCS elbows on SG 32, code fit-up could not be obtained on the hot leg elbow. To accomplish the code fit-up, the existing hot leg elbow was removed and a new replacement elbow was installed. Code fit-up was achieved with the modified replacement elbow. No new weld joints were introduced into the RCS piping system.

One additional weld joint was added to each of the following lines to obtain code fit-up. MS-28"-1, MS-28"-2, MS-28"-3, MS-28"-4, BFD-18"-5, BFD-18"-6 and BFD-18"-7.

With the exception of the blowdown piping, all small bore piping (blowdown, shell drain and level taps) was reinstalled to its pre-steam generator replacement configuration.

To accommodate the increased SG blowdown nozzle size, two-2 1/2" to 2" reducing elbows were installed using open butt welds on the steam generator side of the BD-1 isolation valves.

After installation and NDE examination, primary and secondary side hydrostatic testing was performed in accordance with the applicable requirements of ASME Section XI.

The Owners Report for Repairs or Replacements, Form NIS-2 is on file at Indian Point 3.

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
SUMMARY OF HYDROSTATIC TESTS PERFORMED
DUE TO REPLACEMENT OF THE STEAM GENERATORS

As a result of the replacement of the steam generators, a hydrostatic test was performed on the primary and secondary sides of the steam generators to test the integrity of the connections made as required by the ASME Boiler and Pressure Vessel Code Section IX 1983 Edition up to and including the Summer 1983 Addenda. A summary of these tests follows:

PRIMARY SIDE HYDROSTATIC TEST

An inservice pressure test of the reactor coolant system was performed in accordance with procedure PT-TY-R51A, Rev. 0. This test is a pressure test of the system at a pressure of 2335-0+25 psig and at a temperature >500°F in accordance with the ASME Code Section XI, Paragraph IWB-2000 and IWB-5000 and the Plant Technical Specifications. The hold time was 4 hours. The inspection boundary, identified in the procedure, included the steam generator hot and cold leg nozzle to reactor coolant pipe welds and the hot leg elbow to pipe weld on the no. 32 steam generator elbow that was replaced. The results were satisfactory.

SECONDARY SIDE HYDROSTATIC TEST

A hydrostatic test was performed on the secondary side of each steam generator in accordance with procedures ENG-344A, B, C and D, Rev. 0. This test was a hydrostatic test of the secondary side at a pressure of 1356 psig and a minimum temperature of 70°F in accordance with the ASME Code Section XI, Paragraph IWA-5000 and IWC-2000. The hold time was 10 minutes. The inspection boundary is in the procedure but included all secondary side connections as described in the steam generator replacement summary. The results were satisfactory.

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