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April 27, 2001
IPN-01-038

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

Subject: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Supplemental Information Regarding Third Ten Year Inservice Inspection Interval Program Plan (TAC No. MA9757)

Reference:
1. NYPA letter IPN-00-055 to NRC, "Third Ten Year Inservice Inspection Interval," dated July 18, 2000.
2. NYPA letter IPN-00-024 to NRC, "Request for Additional Information Regarding Third Ten Year Inservice Inspection Interval Program Plan," dated March 20, 2001.

Dear Sir:

The purpose of this letter is to supplement the Third Ten Year Inservice Inspection Interval program (Reference 1) and a response to an NRC request for additional information (Reference 2) that are currently under NRC review as follows:

1. Relief Request 3-2(H) has been modified (Attachment 1) to limit the relief request for vision testing until the end of refueling outage 11. This refueling outage is scheduled to begin April 27, 2001.

2. Relief Request 3-3(H) has been modified (Attachment 1) to remove an internal inconsistency. The relief is requested for Class 1 and 2 connections but the discussion of alternate examinations or tests referenced Class 3 components. The reference to class 3 components has been removed since the Class 3 connections are not borated for the purpose of controlling reactivity. The references to Class 1 and 2 connections was clarified by indicating that it is Class 1 and 2 connections borated for the purpose of controlling reactivity.

3. Relief Request 3-8 has been modified (Attachment 1) to allow the current program for the qualification of UT personnel to remain in place until October 15, 2001, with a stipulation that no personnel be certified or re-certified under the current SNT-TC-1A program after August 31, 2001.

4. Relief Request 3-13 is withdrawn.

A047

5. Relief Request 3-15 was discussed in a telecon with the NRC staff and it was agreed the relief request would be modified to clarify that it was not applicable to stainless steel. It was also agreed that Entergy would provide by letter four procedures (i.e., AP- 39 "IP3 ASME Code Section XI Repair/Replacement Program," Revision 9, AP-49, "Inservice Inspection Program," Revison 5, CES-7, "Procedure for Structural Evaluation of Errosion-Corrosion, and NEAP-26, "Administrative Controls For Containment Weld & Support Inspection And Errosion-Corrosion Programs," Revision 2). These are in Attachment II.

There are no new commitments made by this letter. If you have any questions, please contact Mr. Stephen Prussman.

Very truly yours,

Robert J. Barrett
Vice President - Operations
Indian Point 3 Nuclear Power Plant

Attachments as stated

cc: U.S. Nuclear Regulatory Commission
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King of Prussia, PA 19406

Resident Inspector's Office
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ATTACHMENT I TO IPN-01-038

THIRD TEN YEAR INSERVICE INSPECTION INTERVAL PROGRAM PLAN REVISED RELIEF REQUESTS

Relief 3-2 (H), Revision 3
Relief 3-3 (H), Revision 3
Relief 3-8 (I), Revision 2

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

Indian Point #3
Third Inservice Inspection Interval
Relief Request No. 3-2 (H), Revision 3

A. ARTICLE IDENTIFICATION:

IWA-2300

B. EXAMINATION REQUIREMENTS:

ASME Section XI 1989 Edition,IWA-2300, requirements for qualification and certification of VT-2 visual examination personnel.

C. RELIEF REQUESTED:

Indian Point 3 requests relief from the requirements of IWA-2300 until the end of refueling outage 11. Pursuant to 10CFR50.55a(a)(3)(i) relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

D. BASIS FOR RELIEF:

As stated in Code Case N-546, plant personnel (e.g., licensed and non-licensed operators, system engineers, testing technicians) with the specified training and plant walkdown experience need not be qualified nor certified to comparable levels of competence in accordance with ANSI N45.2.6. Experience in identifying equipment problems and knowledge of operating conditions will enhance the ability of plant personnel to locate leakage during VT-2 examinations. With the specified four hours of training on Section XI requirements and plant specific procedures for VT-2 examinations, the designated plant personnel will understand how leaks should be identified and documented and be fully capable of performing VT-2 examinations.

Qualifying personnel for VT-2 examinations under Code Case N-546 is less burdensome than qualifying and maintaining the present VT-2 certification. Adopting this Code Case would make it feasible to train more people to perform these tasks. Furthermore, using personnel who are already required to perform functions in the plant will reduce the number of people required to enter into areas that may be radiologically restricted, resulting in fewer plant workers exposed to potential radiation dose and keeping radiation exposure as low as reasonably achievable.

Additionally, use of on-shift personnel will improve the process of returning systems to service. Prompt return of safety systems to service will improve the safety of the plant and the public.

E. ALTERNATIVE EXAMINATIONS OR TESTS:

Indian Point #3
Third Inservice Inspection Interval
Relief Request No. 3-2 (H), Revision 3

Indian Point 3 proposes the following alternative qualification requirements for VT-2 visual examination personnel:

(1) Vision test requirements of IWA-2321, 1989 Edition, which is the ISI Code of Record for the IP3 ISI Program; for a period until the end of refueling outage 11. Then vision test requirements of IWA-2321, 1995 Edition shall be used thereafter.

(2) Develop procedural guidelines for obtaining consistent, quality VT-2 visual examinations in accordance with IWA-2210.

(3) At least 40 hours of plant walkdown experience, such as that gained by licensed and non-licensed operators, local leak rate personnel, system engineers and inspection and nondestructive examination personnel.

Note: Documentation of the walkdown experience is a one-time effort and will be maintained in the personnel qualification records.

(4) Independent review and evaluation of detected leakage shall be performed by personnel other than those that performed the VT-2 visual examinations, in accordance with IWA-1400(n).

(5) At least four (4) hours of training on Section XI requirements and plant specific procedures for VT-2 visual examination. VT-2 examination personnel shall be qualified by examination to demonstrate knowledge of Section XI and plant specific procedures for VT-2 visual examination.

(6) Re-qualify examination personnel every 3 years, in accordance with the requirements of item b of Code Case N-546.

Indian Point #3
Third Inservice Inspection Interval
Relief Request No. 3-2 (H), Revision 3

F. JUSTIFICATION FOR REQUESTING RELIEF

In accordance with the provisions of 10CFR50.55A(a)(3)(i), the proposed alternative qualification requirements will provide an acceptable level of quality and safety. The proposed alternative qualification requirements are similar to those of ASME Section XI Code Case N-546, with additional provisions based on further discussions with the NRC. The Nuclear Regulatory Commission has not generically approved Code Case N-546 in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability ASME Section XI Division 1." This Relief Request is similar to a Relief submitted and approved for JAFNPP with similar provisions but for the 1989 vision test requirements. Our next refueling outage is currently scheduled for April 27, 2001. In concert with using Code Case N-546, this Request seeks additional relief to use the 1989 vision test requirement for a period until the end of refueling outage 11 since all plant personnel and most of the staff on loan from our other Entergy plants to support R11 are currently qualified to the 1989 vision test requirements. This relief on the 1995 vision test requirement is requested on the basis that compliance with the specified requirements of this condition would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

G. IMPLEMENTATION SCHEDULE:

The requirements as specified in this relief request will be incorporated into the IP3 Inservice Inspection Program during the 3rd 10-Year Interval.

H. ATTACHMENTS TO THE RELIEF:

Code Case N-546.

Indian Point #3
Third Inservice Inspection Interval
Relief Request No. 3-3 (H), Revision 3

A. ARTICLE IDENTIFICATION:

IWA-5000, Section IWA-5242(a)

Class: 1 and 2

System: Reactor Coolant, Chemical and Volume Control, Safety Injection and Residual Heat Removal.

B. EXAMINATION REQUIREMENTS:

ASME Section XI 1989 Edition, IWA-5242,

(a) For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for VT-2 visual examination.

C. RELIEF REQUESTED:

Indian Point 3 requests relief from all requirements of IWA-5242(a). Pursuant to 10CFR50.55(a)(3)(ii) relief is requested on the basis that compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

D. BASIS FOR RELIEF:

Inside containment, the referenced systems are tested in an environment that is hazardous to personnel. Removing and reinstalling insulation under these conditions is difficult to perform and is not consistent with the ALARA (as low as reasonably achievable) concept when compared to the alternate approach. In addition, the removal and reinstallation of insulation is often a critical path activity which directly affects the duration of refueling outages, therefore placing a financial hardship on the plant.

The concern that led to the Section XI requirement for removal of insulation on bolted connections, while performing pressure testing and VT-2 examinations, is that a borated-water leak from a bolted connection could cause corrosion of the bolting materials. Thus, the structural integrity of a safety-related system could be compromised by a small leak that could be unnoticed if the insulation remains in place during the pressure testing and VT-2 examination.

Indian Point #3

Third Inservice Inspection Interval

Relief Request No. 3-3 (H), Revision 3

This relief request addresses the structural integrity concerns while mitigating the personnel hazards and reducing the critical path impact of the testing. It divides the pressure testing and the VT-2 examination into two activities that need not be performed at the same time. The proposed alternate examination is supported by the following:

(a) ASME Code Case N-533 was approved by the Section XI Code Committee, thus providing an alternative to the similar requirement for examination of insulated Class 1 pressure retaining bolted connections.

(b) Similar relief requests have been approved by the NRC for other nuclear power plants (V.C. Summer Nuclear Station, Surry Power Station and Shearon Harris Nuclear Plant).

(c) Pre-existing boric acid leaks will be detected at atmospheric or static pressures due to residue deposits.

E. ALTERNATIVE EXAMINATIONS OR TESTS:

The following alternate rules for the pressure testing and VT-2 visual examination of pressure retaining bolted connections will be used:

a) A system pressure test and VT-2 visual examination shall be performed each refueling outage for Class 1 connections and each inspection period for Class 2 connections in systems borated for the purpose of controlling reactivity, without removal of insulation.

b) The insulation shall be removed from the bolted connections each refueling outage for class 1 connections and each period for class 2 connections in systems borated for the purpose of controlling reactivity, and a VT-2 visual examination shall be performed. The connections are not required to be pressurized. Any evidence of leakage shall be evaluated in accordance with IWA-5250.

c) As an additional condition, the system pressure test and corresponding VT-2 visual examination will be performed in accordance with the temperature, pressure, and hold time requirements of ASME Section XI.

F. JUSTIFICATION FOR REQUESTING RELIEF

The proposed alternative provides an acceptable level of quality and safety since the insulated bolted connections still receive pressure testing and visual VT-2 examinations each inspection period. There are no changes being made neither to the areas that are inspected nor to visual VT-2 personnel qualifications. Neither are there any changes to acceptance criteria. The alternate reduces critical path time by allowing the insulation removal and inspection to be completed prior to the system leakage test required by ASME XI.

G. IMPLEMENTATION SCHEDULE:

The requirements as specified in this relief request will be incorporated into the IP3 Inservice Inspection Program during the 3rd Ten-Year Interval.

H. ATTACHMENTS TO THE RELIEF:

None

Indian Point Unit 3
Third Inservice Inspection Interval
Relief Request No. 3-8 (I), Revision 2

A. SYSTEM / COMPONENT(s) FOR WHICH RELIEF IS REQUESTED

All components subject to ultrasonic examination with Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI.

B. CODE REQUIREMENTS

Sub-article IWA-2300 requires qualification of NDE personnel to CP-189, 1991 Edition, and the additional requirements of Division 1.

C. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

Relief is requested from the provisions of Sub-article IWA-2300, "Qualification of Nondestructive Examination Personnel. "This requires that personnel performing NDE shall be qualified and certified using a written practice prepared in accordance with CP-189, and the additional requirements of Division 1.

D. BASIS FOR RELIEF

10 CFR 50.55a was amended in the Federal Register (Volume 64, No. 183 dated September 22, 1999) to require the use of the 1995 Edition, with the 1996 Addenda for Appendix VIII qualification requirements. This also imposes the requirements of IWA and Appendix VII of the 1995 Edition, with 1996 Addenda of Section XI. This includes Sub-article IWA-2300, which requires a written practice prepared in accordance with CP-189, 1991 Edition, as amended by the requirements of Division 1.

This requires development, implementation, and to the extent possible consolidation, of multiple certification requirements into one or more written practices. This is needed to address the various NDE certification requirements contained in SNT-TC-1A, for non-Appendix VIII applications and CP-189, for Appendix VIII applications. These are further modified by IWA-2300 and Appendix VII, as amended by respectively the 1989 Edition of Section XI or the 1995 Edition with 1996 Addenda of Section XI.

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(ii) that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. IP3's current Code of Record is the 1989 Edition, No Addenda, of the Section XI Code. The initial certification and re-certification of ultrasonic examination personnel requirements are in accordance with the 1989 Edition of Section XI and include the use of ASNT SNT-TC-1A, 1984, as amended by IWA-2300 and Appendix VII of Section XI, 1989 Edition. An additional burden would be imposed on IP3 due to the short duration of time before the start of the upcoming Refueling Outage R11 which is currently scheduled for April 27, 2001. There are administrative/personnel constraints experienced by IP3 as a result of the transfer of the ownership of the plant from NYPA to Entergy, specifically a number of senior technical staff, including one of the two site Level IIIs had taken early retirement. IP3 is actively looking for a replacement but is limited in resources to implement a full CP-189 program before the upcoming refueling outage. The required procedural changes, manpower resources, and in some cases additional training and re-certification of personnel would place an unnecessary burden and hardship on the finite resources available before the outage. In addition, there are no scheduled Reactor Vessel UT examinations in the upcoming refueling outage scheduled to begin in April of 2001.

In lieu of developing and maintaining redundant programs, the proposed alternative of maintaining the current program for qualifications of UT personnel for a period of up to October 15, 2001, with a stipulation that no personnel be certified or re-certified under the current program after August 31, 2001, would simplify record keeping; satisfying the need to maintain personnel qualifications, eliminate redundant systems, and provide an acceptable level of quality and safety commensurate with the other NDE disciplines. It is noted that the Fitzpatrick Nuclear Power Plant also owned by Entergy was granted a similar relief with a 1-year extension.

A comparison of the implementation requirements for Appendix VIII examinations using the 1984 Edition of SNT-TC-1A as modified by IWA-2300 and Appendix VII of the 1989 Edition of Section XI with the 1991 Edition of CP-189 as modified by IWA-2300 and Appendix VII of the 1995 Edition and 1996 Addenda of Section XI is considered to be unwieldy and subjective because of their myriad differences. Therefore, three less complex comparisons of technically significant items are attached. One compares IWA-2300 from the 1995 Edition with the 1996 Addenda to the 1989 Edition. Another compares Appendix VII to the 1995 Edition with the 1996 Addenda to the 1989 Edition. The last compares the 1991 Edition of CP-189 with the 1984 Edition of SNT-TC-1A as modified by Appendix VII.

As written, there are a number of differences between CP-189 and SNT-TC-1A. However, as illustrated in the comparisons, these are minimized by the moderating effects of the applicable IWA-2300 requirements and especially the Appendix VII requirements. Compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For example, the 1995 Edition with the 1996 Addenda requires near vision acuity of 20/25 or greater Snellen fraction while the 1989 Edition requires Jaeger No. 1 print. Development and administration of a second or consolidated program would not enhance safety or quality and would serve as a burden, particularly in developing an additional written practice, tracking of certifications, duplication of paperwork, etc. This duplication would also apply to NDE vendor programs.

Current certifications are not affected, paragraph IWA-2310 in the 1995 Edition with 1996 Addenda states that certifications based on SNT-TC-1A are valid until re-certification is required.

E. PROPOSED ALTERNATE

The current program for the initial certification and re-certification of UT personnel shall continue to remain in place until October 15, 2001. No personnel will be certified or re-certified under the current SNT-TC-1A program after August 31, 2001.

F. IMPLEMENTATION SCHEDLUE

July 21, 2000 through October 15, 2001.

G. ATTACHMENTS TO THE RELIEF

Comparison of the Qualification and Certification Requirements of Ultrasonic Examiners Certified to CP-189, 1991, and SNT-TC-1A, 1984, as modified by IWA and Appendix VII of 1989 and 95/96 Edition of Section XI respectively.

COMPARISON OF THE QUALIFICATION AND CERTIFICATION REQUIREMENTS OF ULTRASONIC EXAMINERS CERTIFIED TO CP-189, 1991, AND SNT-TC-1A, 1984, AS MODIFIED BY IWA AND APPENDIX VII OF 989 AND 95/96 EDITION OF SECTION XI RESPECTIVELY

The following is a summary of pertinent technical aspects of the implementation requirements contained in Subparagraph IWA-2300 to the two Editions of ASME Section XI identified below.

The comparison is complicated because some of the requirements may be modified or omitted, simply because they are defined in another location or by another document. Several requirements, such as those for limited certification, differ somewhat but the differences are not considered technically relevant and they are not detailed in this technical comparison. These complications are representative of the increased burden when administering more than one program or a program based on varying requirements.

1995 Ed with 1996 Add of Section XI	1989 Edition of Section XI
IWA-2310 – Written practice is prepared using ANSI/ASNT "Standard" CP-189, 1991 Edition. Certifications based on SNT-TC-1A remain valid until re-certification.	IWA-2310 – Written practice is prepared using ASNT "Recommended Practice" SNT-TC-1A, 1984 Edition. Certifications based on earlier editions remain valid until re-certification.
IWA-2311 – The written practice shall specify the duties and responsibilities of the Principle Level III.	
IWA-2312 – NDE methods listed in CP-1989 – Similar to 1989 IWA-2311.	IWA-2311 – NDE methods listed in SNT-TC-1A – Similar to 95/96 IWA 2312.
IWA-2313 – NDE methods not listed in CP-189 – Similar to 1989 IWA-2312.	IWA-2312 – NDE methods not listed in SNT-TC-1A – Similar to 1989 IWA-2313.
IWA-2314 – Level I and II re-certified every 3 years, Level III every 5 years by examination per CP-189. ASNT Level III not required.	IWA-2313 – Level I and II re-certified every 3 years, Level III every 5 years by examination per SNT-TC-1A.
IWA-2321 – Snellen 20/25 using lower case letters with a known pre-measured height (see IWA-2322). Per Administered in accordance with a procedure, and by personnel, approved by an NDE Level III designated by the employer.	IWA-2321- Jaeger number 1 or equivalent, conducted by personnel qualified to conduct the examinations.
IWA-2322 – Requires use of 10x magnifier to measure height of letters.	
IWA-2323 – Level III qualifications evaluated by Basic, Method, Specific, and Practical examinations and the Demonstration examination (Level II Practical).	IWA-2322 – Level III qualifications determined by Basic, Method, and Specific examinations per SNT-TC-1A. (Demonstration examination would be required by Section XI, Appendix VIII)
CP-189 General, Specific and Practical examinations administered and graded by a Level III.	IWA-2323 – Level I and II qualifications determined by General and Specific examinations, and a Practical hands-on

	examination administered by a Level III.
95/96 Appendix VII is similar to 1989 Appendix VII (See detailed comparison following).	IWA-2324 – Defines requirements for administration of examinations. This is Modified by Appendix VII.
IWA-2330 – Level I responsibilities. Identical to 1989 IWA-2330.	IWA-2330 – Level I responsibilities. Identical to 95/96 IWA-2330.
IWA-2340 – Level III education. Similar to 1989 IWA-2340.	IWA-2340 – Level III education. Similar to 95/96 IWA-2340.
IWA-2350 – Defines limited certification. Provides more definition than 1989.	IWA-2350 – Defines limited certification requirements.
IWA-2360 – Allows certification directly to Level II. Defines additional Level III responsibilities.	Appendix VII allows certification directly to Level II. Defines similar Level III responsibilities.
IWA-2370 – Contains experience requirements for Level II candidates.	1989 Appendix VII contains requirements that are more stringent.

Indian Point Unit 3
Third Inservice Inspection Interval
Relief Request No. 3-8 (I), Revision 2

The following is a summary of pertinent technical aspects of the implementation requirements contained in Subparagraph IWA-2300 to the two Editions of ASME Section XI identified below.

The comparison is complicated because some of the requirements may be Modified or omitted, simply because they are defined in another location or by another document. Several requirements, such as those for limited certification, differ somewhat but the differences are not considered technically relevant and they are not detailed in this technical comparison. These complications are representative of the increased burden when administering more than one program or a program based on varying requirements.

95/96 APPENDIX VII	1989 APPENDIX VII
VII-1000 – Scope – Modifies the requirements of IWA-2300 for Ultrasonic examiners	VII-1000 - identical to 95/96
VII-2000 – Qualification Levels – Identifies 5 qualification Levels as defined in CP-189	VII-2000 – essentially the same. Defines NDE Instructor qualification since it is not included in SNT-TC-1A.
VII-3000 – Written Practice – Defines the written practice, including the definition of an "outside agency" as an independent company or a functionally independent organization within the same company.	VII-3000 Identical to 95/96 except "outside agency" is not defined.
VIII-4000 –	Qualification Requirements
CP-189 contains no simultaneous experience provisions.	Table VII-4110-1 states the simultaneous experience provision of SNT-TC-1A is not applicable.
Paragraph VII-4223 requires previously qualified individuals to meet the requirements for training	Both Appendices in paragraph VII-4300 state that to be considered for examination the Level I, II, and III candidates shall have successfully completed the training required in VII-4200.
Paragraph VII-4240 states that no examination is required for the annual retraining.	
Paragraph VII-4310 (a) states that a random selection process must be controlled by the written practice so no individual takes the same examination more than once.	
Paragraph VII-4310 (b) allows the use of "grading units" to produce a specimen bank for the practical examination	
Paragraph VII-4330 (a) Level III examinations per IWA-2300, Basic, Method, Specific, Practical, Demonstration, contains rules for Level II practical	While the 1989 Appendix VIII contains no requirements for a practical examination, it would be required for the mandatory Appendix VIII.

examination. An Appendix VIII practical is acceptable.	
Paragraph VII-4330 (b) allows re-certification of Level III personnel using only the Method and Specific examinations.	IWA-2313 requires re-certification using Basic, Method, and Specific written examinations
Not addressed	VII-6000 – Defines duties of the ANII

Indian Point Unit 3
Third Inservice Inspection Interval
Relief Request No. 3-8 (I), Revision 2

The following is a summary of pertinent technical aspects of the implementation requirements contained in CP-189, 1991; and SNT-TC-1A, 1984.

Comparisons are not detailed in those areas where CP-189 is modified by the requirements of Appendix VII. Please note that the word "should" typically identifies what is considered a requirement in SNT-TC-1A, while CP-189 typically uses the word "shall". Industry practice is to treat SNT-TC-1A recommendations as requirements. Several paragraphs are identified as similar. This is subjective. For example, while SNT-TC-1A does not specifically require suspension of an examiners certification for a lapsed vision examination, it is considered to be implied, and it is industry practice to do so.

CP-189	SNT-TC-1A
1.0 – Scope – CP-189 is a standard that establishes the minimum requirements.	1.0 – Scope – SNT-TC-1A is a recommended practice establishing guidelines.
2.0 – Definitions – More inclusive (19 terms) and more concise. Some Modified by Appendix VII.	2.0 – Definitions – Less inclusive (7 terms)
3.0 – Levels	Of Qualification
3.1 – Classification	Modified by Appendix VII
3.2 – Level III	4.3 (3) – Similar to CP-189
3.3 – Level II	4.3 (2) – Similar to CP-189
3.4 – Level I	Modified by Appendix VII
3.5 – Trainee	4.2 – Similar to CP-189
3.6 – NDE Instructor	Modified by Appendix VII
4.0 Qualification	Requirements
4.1 – Training	Modified by Appendix VII
4.2 – Experience	Modified by Appendix VII
4.3 – Previous Training and Experience	Modified by Appendix VII
4.4 – NDT Instructor	Modified by Appendix VII
4.5 – Outside services	Modified by Appendix VII
5.0 – Qualification	And Certification
5.1 – Procedure	Modified by Appendix VII
5.2 – Procedure requirements	Modified by Appendix VII
5.3 – Approval – "written practice" approved by Level III	Modified by Appendix VII – Requires that "written practice" specify responsibilities.
6.0 Examinations	
6.1 – Vision	Modified by IWA-2300
6.2 – Level III Examination	Modified by Appendix VII
6.3 – Level I and II Examination	Modified by Appendix VII
6.4 – Administration and grading	Modified by Appendix VII
6.5 – Reexamination	Modified by Appendix VII
6.6 – Administration of Examinations – prohibits one's self or one's subordinate from preparing or administering an examination.	Not specifically addressed

7.0 Expiration, Suspension, Reinstatement of Employer	Revocation, and Certification
7.1 – Expiration	Similar to CP-189
7.2 – Suspension	Similar to CP-189
7.3 – Revocation	Similar to CP-189
7.4 – Reinstatement	Similar to CP-189
8.0 Employer	Re-certification
8.1 – NDT Level I and II	Modified by Appendix VII
8.2 – NDT Level III	Modified by Appendix VII
9.0	Records
9.1 – Responsibility for Documentation	Modified by Appendix VII
9.2 – Contents of Certification Record	Modified by Appendix VII

ATTACHMENT II TO IPN-01-038

THIRD TEN YEAR INSERVICE INSPECTION INTERVAL PROGRAM PLAN PROCEDURES FOR RELIEF REQUEST 3-15

AP-39 "IP3 ASME Code Section XI Repair/Replacement Program," Revision 9

AP-49, "Inservice Inspection Program," Revison 5

CES-7, "Procedure for Structural Evaluation of Errosion-Corrosion Thinning In Carbon Steel Piping," Revision 2

NEAP-26, "Administrative Controls For Containment Weld & Support Inspection And Errosion/Corrosion Programs," Revision 2

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

New York Power Authority

Indian Point 3

Procedure Use Is:

☐ Continuous

☐ Reference

■ Information

Control Copy: 406

Effective Date: 4-AUG-00

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■ TSR

☐ NTSR

INFORMATION ONLY

AP-39, Revision 9

IP3 ASME CODE SECTION XI REPAIR/REPLACEMENT PROGRAM

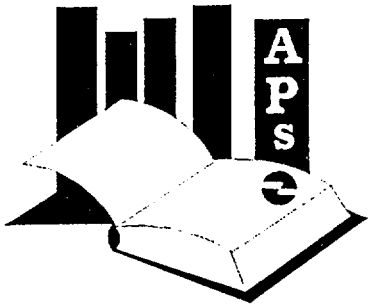
Approved By:

Site Executive Officer — Date: 7/24/00

Maintenance Department Manager — Date: for T.Y. 7/21/00

PORC Meeting Number

INDIAN POINT 3
ADMINISTRATIVE
PROCEDURES



MINOR Revision

REVISION SUMMARY

1. REASON FOR REVISION

1.1 MINOR REVISION to incorporate the ASME Section XI 3rd 10-Year Inservice Inspection Interval.

2. SUMMARY OF CHANGES

2.1 Revised Step 4.1.1.4.

2.2 Revised Reference 7.1.1.

2.3 Revised Attachments B and C.

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1.0 PURPOSE

1.1 To establish the requirements for repairs and replacements of ISI Class 1, 2, 3 (including 3A) piping, components, or systems, and Class MC and Class CC structures and components, in accordance with the ISI Program and ASME Section XI to ensure structural integrity of pressure retaining components over the life of plant operation.

1.2 This program applies to piping, components, and/or systems classified as ISI Class 1, 2, 3 (as well as 3A), MC and CC at Indian Point 3.

NOTE

Class 3A piping and components shall follow the repair/replacement, testing and evaluation requirements of ISI Class 3.

2.0 PRECAUTIONS and LIMITATIONS

None

3.0 PREREQUISITES

None

4.0 PROCEDURE

4.1 Section XI Component Determination

NOTE

A Section XI Traveller is required for all components greater than 1" NPS and as defined by activities listed in Section 4.2. Additionally, for repair activities, a Section XI traveller is required for all size components, including less than 1" NPS.

4.1.1 The *Work Package Planner* shall determine whether the component is within the boundaries of the ASME Section XI program using the IP3 ISI System Boundary drawings (see Attachment A, List of System Boundary Drawings) and Attachment B, Section XI Applicability Decision Tree, to distinguish work activities as repair, replacement (including modifications), maintenance or outside the scope of Section XI. The *Work Package Planner* may consult with the ISI Coordinator regarding Class MC and CC component repair/replacement activities, as well as Attachment E, 'Typical Containment Penetrations and Class Designations,' and Attachment F, 'Typical Boundary Jurisdictions for Welded Connections for Class MC Containment Vessels.'

NOTE

For all ISI Class 1 valve and pump activities, the work package planner will coordinate with the ISI Engineer/designee or IST Engineer to determine any additional ISI/IST inspections.

4.1.1.1 All mechanical and electrical penetrations (and their integral attachments) into the vapor containment (VC) building are considered to be "MC" components and are within the boundaries of the ASME Section XI Program. This also includes both the 95' and 80' airlocks.

4.1.1.2 The VC metal liner (including mini-containment) and it's integral attachments are considered to be "MC" components and are within the boundary of the ASME Section XI Program.

4.1.1.3 The VC concrete containment is considered to be a "CC" component and is within the boundary of the ASME Section XI Program. The *work package planner* shall consult with the Concrete Engineer and/or ISI Coordinator regarding CC component activities.

NOTE: The *Work Package Planner* should consult with the ISI Coordinator regarding MC and CC components and piping, valves, and pumps attached to the VC and follow steps 4.1.1 through 4.1.1.4 for additional guidance.

4.1.1.4 MC and CC components shall meet the requirements of ASME Section XI 1992 edition, including 1992 Addenda (or other sections of ASME Section XI as detailed in the ISI Program Plan), for all IWE/IWL Repair/Replacement activities. R

4.1.1.5 IF components are **NOT** in the Section XI Boundary, THEN these items are not covered within the scope of this procedure and AP-39 does not apply.

4.1.1.5.1 These components shall be worked under the typical work control process.

4.2 **Section XI Activity Determination**

4.2.1 The *Work Package Planner* should use Attachment B Flowchart to determine decision process for Section XI applicability.

4.2.2 The following are examples of items which are considered to be exempt from ASME Section XI Repair/Replacement activities; see IWA-7400 for additional explanations/examples (but may be considered maintenance activities, see Section 4.2.3):

- Disassembly and reassembly of mechanical joints where a pressure boundary component replacement has not taken place. For example, a gasket in a flanged valve has been replaced.

- Lapping of seating surfaces on valves and valve disks where no pressure retaining material is removed.
- Use of injection sealants and application of paints and non-metallic coatings to the component. Injection sealants, i.e., leak repair, on ISI components is considered a temporary repair and shall comply with requirements of AP-13, 'Temporary Modifications.'
- Heat exchanger tube plugging by mechanical means.
- Thread chasing and dressing.
- Repacking pumps or valves including mechanical seal replacements.
- Buffing, polishing, sandblasting and honing to pressure boundary components.
- Replacement of rubber valve diaphragms.
- Replacement of orifice plates and spacer rings without the use of a welding process.
- Replacement of gasket materials (including seals, gaskets, moisture barriers for Class MC components such as the containment, penetrations, metal liners, however, ISI tests may be required). Coordinate with ISI Engineer/designee.
- Internals replacement not involving the pressure boundary of the component.
- Application of coatings to MC and CC components which do not affect the pressure boundary.
- Replacement of piping, valves, and fittings one inch (1") nominal pipe size and less are exempt from Section XI repair/replacement requirements, except that materials and primary stress levels shall be consistent with the requirements of the Construction Code, see Section XI IWA-7400. (Repairs to components less than 1" are <u>not</u> exempt).

NOTE: Replacement of pressure boundary bolting on ISI components is typically considered an ASME Section XI Repair/Replacement activity.

4.2.3 <u>IF</u> the activity is determined <u>not</u> to be a Section XI Repair/Replacement activity, <u>THEN</u> activities may be considered maintenance activities or non-code work and the following shall be completed:

4.2.3.1 A Section XI Traveller shall be prepared in accordance with Attachment C, 'Section XI Traveller,' or by preparing a ROME system electronic facsimile of the information contained in these attachments.

NOTE: The NIS-2 form is not required for Maintenance activities.

4.2.3.2 The Section XI Traveller routing shall be shortened to only require the R/R Coordinator (verify that no Section XI Repair/Replacement activity exists), the ISI Engineer (verify any ISI Tests/Requirements), and the IST Engineer (verify any IST Tests/Requirements).

4.2.3.3 Following this shorter review cycle, the *Work Package Planner* will revise the work package, as necessary, to reflect any ISI/IST requirements prior to continuing with the work package review.

4.2.3.4 At a minimum, the work package planner shall add a note to the package stating that any revision to the work activity may require a Section XI repair/replacement revision in accordance with this procedure.

4.2.4 IF the activity is considered an ASME Section XI repair or replacement, THEN a Section XI Traveller and NIS-2 Report shall be prepared in accordance with Section 4.3 and Attachment C, 'Section XI Traveller,' and Attachment D, 'Form NIS-2 Owner's Report for Repairs or Replacements,' or by preparing a ROME System electronic facsimile of the information contained in these Attachments.

NOTE: It is the responsibility of the responsible engineer to evaluate the failure or replacement acceptability, however, the work package planner shall be responsible to incorporate this into the work package. This evaluation may be a design change, DER or other engineering document.

4.2.4.1 IF the cause of a failure/repair or replacement is a deficiency in the specification, such as incorrect material for service application of the existing part or component, THEN the Responsible Engineer shall ensure that:

- the replacement component specification reflects the appropriate corrective provisions; AND
- such corrective provisions are consistent with the relevant requirements of the design code or latest construction code in effect at the time of the specification revision.

4.2.4.2 The work package planner shall incorporate this reference into the work package.

4.3 Section XI Traveller/NIS-2 Preparation and Review

4.3.1 The *Work Package Planner* (or cognizant engineer) shall fill in all necessary information on the Traveller and NIS-2 Form to include all header information through Steps 17 on the Section XI Traveller and all header information and component information on the NIS-2 Form (see Attachments B, C, D for guidance in preparing these forms).

4.3.1.1 The NIS-2 Form is required for Section XI repairs/replacements only. The NIS-2 Form is not required for maintenance activities and does not require closeout.

4.3.2 The *Work Package Planner* shall forward the Traveller and NIS-2 Form to the Repair/Replacement (R/R) Coordinator.

4.3.3 The *R/R Coordinator* shall verify the information and classification of the component(s) and provide a Section XI Traveller number (for repairs and replacements only).

4.3.4 The Section XI Traveller shall then be submitted to the ISI Coordinator/designee for determination of preservice inspection requirements/ISI requirements.

4.3.4.1 IF a replacement due to failure involves "like in kind" material, THEN the *WPO ISI Coordinator* shall develop an inspection schedule to preclude a future failure. This may be initiated by the *ISI Coordinator* via a ROME-PID or via an ACTS ITEM to perform ISI inspections at some future time to prevent component failure.

4.3.4.2 The *R/R Coordinator* may act as the ISI Coordinator designee to specify certain preservice inspection requirements. The *R/R Coordinator* shall coordinate with the *ISI Coordinator* for Preservice Inspection Requirements for ASME Section XI Repair/Replacement Activities.

4.3.4.3 IF the *R/R Coordinator* provides the preservice inspections for the activity, THEN the *ISI Coordinator* shall be notified of the activity and the requirements specified. The *R/R Coordinator* and the *ISI Coordinator* shall make arrangements for notifications that occur during off hours.

NOTE: Only the *R/R Coordinator/designee* can specify preservice inspection requirements for the ISI Coordinator.

4.3.4.4 For maintenance activities, the *ISI Coordinator* or designee (WPO Engineering Programs) shall review the traveller. The R/R coordinator may act as his designee for this review, in emergency situations.

4.3.5 The Section XI Traveller shall be routed to the IST Engineer for determination of pressure testing and IST requirements.

4.3.6 Any Section XI Traveller which involves concrete repair/replacement activities, shall be routed to the Concrete Engineer for evaluation and determination of repair methods and inspection requirements.

4.3.7 The *R/R Coordinator* shall notify the ANII of all repair/replacement activities. The ANII and the *R/R Coordinator* shall make arrangements for notifications that occur during off-hours (typically the *R/R Coordinator* shall notify the ANII during the planning process and in advance of the R/R activity). The Section XI Traveller (with all applicable items completed), the work step text, and weld data checklists (if welding is required) shall be provided to the ANII for his initial review at his discretion.

4.3.7.1 Following the ANII notification, the *Work Package Planner* may revise the work package to reflect the necessary Section XI requirements, as described in Step 4.3.10.

4.3.8 The Section XI Traveller shall be routed to the appropriate Quality Services Group for review for all repairs/replacements.

4.3.9 Upon completion of all other reviews, the *R/R Coordinator* shall review the work documentation to ensure that all ASME Section XI requirements have been identified for repairs/replacements.

4.3.10 Once the Section XI Traveller is completed, the *Work Package Planner* shall update the step text of the work package(s), as required, with all the necessary inspections and hold points that were identified during the traveller review.

4.3.10.1 As a minimum the *Work Package Planner* shall add a note to the work package(s) stating that ANY change or addition of work activities to the Section XI components not currently included in the Section XI Traveller shall be reviewed in accordance with this procedure. The Section XI Traveller shall then be revised prior to the new work being performed (see Section 4.5 of this procedure for Section XI Traveller Revisions).

4.3.11 It is the responsibility of the work group performing the work to ensure that ALL requirements, inspections, and hold points identified on the Section XI Traveller are completed as required.

4.3.11.1 IF a revision to a Section XI Traveller is required, THEN follow Section 4.5 of this procedure.

NOTE: A revision is considered to be an addition of a component or addition/change of work activities to be performed on a component that was not originally specified on the Section XI Traveller.

4.4 Final Review and Closeout for Repair/Replacement Activities

4.4.1 Upon completion of the repair/replacement activity, the *R/R Coordinator* shall review all work package documentation to verify that the activity was completed as planned and to ensure that all completed work conforms to the rules of ASME Code Section XI.

4.4.1.1 The applicable *Work Group* shall ensure that a copy of all test/inspections is included in the completed work package.

4.4.2 The *R/R Coordinator* shall sign as the owner's designee on the NIS-2 form to certify that the repair/replacement activity was performed in accordance with ASME Code, Section XI.

4.4.3 The following completed documents (or evidence of completion) shall be presented to the ANII for his final review:

- Section XI Traveller
- NIS-2 Report of Repair/Replacement
- Work Step Text
- Weld Data Checklists (if welding was performed)
- Construction Code/Design Specification NDE Reports (if required on Weld Data Checklists)
- Section XI Pressure Test Report (retest or VT-2 record)
- Section XI Preservice Examination Data (if required)
- For Replacement items: Evaluation of suitability of replacement (as required by IWA-7220 and 7520(a))

4.4.4 If acceptable, the ANII shall sign the final review block on the NIS-2 form.

4.4.5 The *R/R Coordinator* shall coordinate with the ISI Coordinator to provide copies of completed NIS-2 Forms, so that they can be included in the Outage Summary Report (IWA-6000). Repairs and replacements conducted since the preceding refueling outage shall be included.

4.5 **Section XI Traveller Revision**

4.5.1 The *Work Package Planner* shall coordinate with the R/R Coordinator any revision to a Traveller.

4.5.2 IF the original activity was considered maintenance and the scope of the revision required a repair/replacement activity, the Work Package Planner shall initiate a new Section XI Traveller and NIS-2 form in accordance with Section 4.3.

4.5.3 IF the scope of the repair/replacement revision does not change any of the pre-service or inservice inspections, or IST/Pressure Test requirements THEN only the R/R Coordinator approval is required.

NOTE

The *R/R Coordinator* may require additional reviews by the ISI Coordinator and IST Engineer.

4.5.4 IF the repair/replacement revision requires a change to the preservice, inservice inspections, or add a test THEN the ISI Coordinator and/or the IST Engineer and the Quality Assurance reviews shall be obtained.

4.5.5 The *R/R Coordinator* shall also notify the ANII of the revision.

4.5.6 The *R/R Coordinator* shall provide final approval for all revisions to R/R Travellers.

4.5.7 Upon approval of a Section XI Traveller revision, the *Work Package Planner* shall update the work package(s) to include any new or revised requirements, inspections, or hold points.

4.5.7.1 As a minimum, the *Work Package Planner* shall add the revised Section XI Traveller to the work package(s) and add a note to the work package(s), as required, stating that a revision to the Section XI Traveller was made and the nature of the revision.

4.5.8 It is the responsibility of the work group performing the work to ensure ALL requirements (including all new/revised requirements, inspection, and hold points) identified on the revised Section XI Traveller are completed as required.

5.0 RESPONSIBILITIES

5.1 The **Authorized Nuclear Inservice Inspector (ANII)** shall be responsible for determining level of involvement in Section XI repairs and replacements; reviews package closeout for adequacy of completed work.

5.2 The **Concrete Engineer** shall be responsible for the development of plans and procedures for examination of concrete surfaces; evaluation of examination results; preparation of repair procedures. This individual is a member of the Civil/Structural Group under the authority of the Design Engineering Manager, and shall either be a registered Professional Engineer, or work under the guidance of a registered Professional Engineer.

5.3 The **In-Service Test (IST) Engineer** shall be responsible for reviewing WR packages describing repairs, replacements and maintenance for pressure test and IST requirements. This individual is a member of the Performance and Reliability Group under the authority of the GM Operations.

5.4 The **In-Service Inspection (ISI) Coordinator** shall be responsible for reviewing WR packages describing repairs or replacements for preservice inspection requirements and for initiation of ISI program changes based on the scope of repairs or replacements. This individual is a member of the Engineering Programs Group - WPO under the authority of the Vice-President of Engineering.

5.5 The **Work Package Planner/Initiator** shall be responsible for initiating and revising ASME Section XI Travellers and applicable sections of the NIS-2 forms.

5.6 **Quality Assurance/Quality Services Group** shall be responsible for reviewing the Section XI Travellers and performing the assigned inspections as required.

5.7 The **Repair/Replacement Coordinator** shall be responsible for:

5.7.1 Ensuring all repair/replacement/maintenance requirements of ASME Section XI Program are implemented and satisfied.

5.7.2 Developing and maintaining procedures to implement the Repair/Replacement portions of the ASME Section XI Program.

5.7.3 Maintaining a log of all repair/replacement activities.

5.7.4 Coordinating revisions to ASME Section XI Travellers.

5.7.5 Formally interfacing with the ANII for Code activities.

5.7.6 This individual is a member of the Maintenance Engineering Group under the authority of the General Manager-Maintenance.

6.0 DEFINITIONS

6.1 See Section XI IWA-2110 for definitions.

7.0 REFERENCES

7.1 **Commitment Documents**

7.1.1 ASME Boiler & Pressure Vessel Code, Section XI "Rules for Inservice Inspection of Nuclear Power Plant Components," ASME Section XI

7.1.2 IP3 ASME Section XI Inservice Inspection Program and Pump and Valve Inservice Testing Program, including all program relief requests

7.1.3 IN94-5, ASME Section XI Inquiry Regarding IWA-4000 Exemptions for Repair Procedures

7.2 **Development Documents**

7.2.1 AP-9, Work Control

7.2.2 AP-13, Temporary Modifications

7.2.3 AP-19, Surveillance Test Program

7.2.4 American National Standard N18.2a-1975/ANSI-51.8 Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants

7.3 Interface Documents

7.3.1 10CFR50.55a, Codes and Standards

7.3.2 USAS B31.1 - 1967 Power Piping

7.3.3 ISI System Boundary Drawings

8.0 RECORDS and DOCUMENTATION

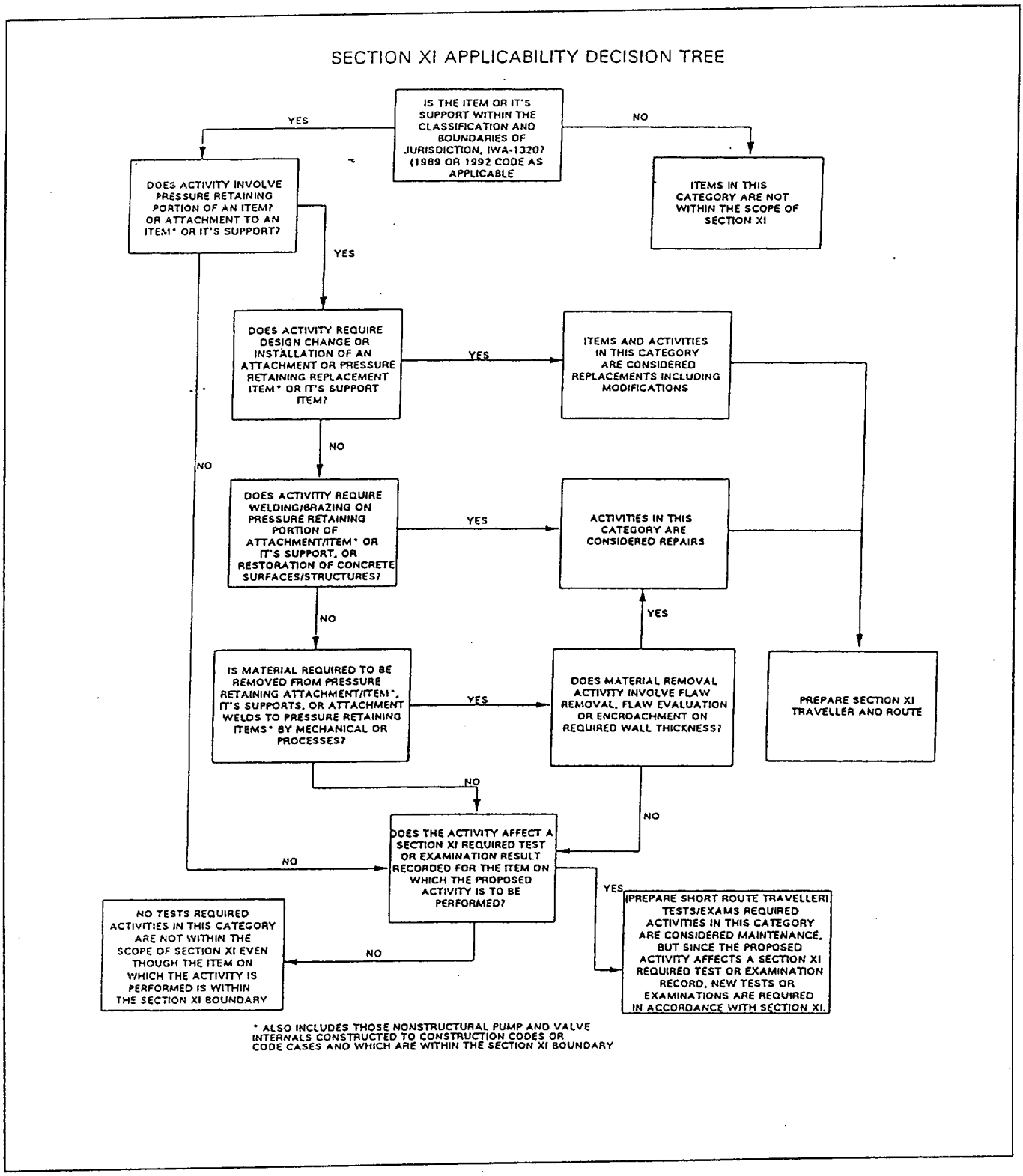
8.1 Records generated as a product of this procedure shall be maintained in accordance with the IP3 Records Retention Schedule.

LIST OF SYSTEM BOUNDARY DRAWINGS

Drawing Number	Title
ISI-20173	Flow Diagram - Main Steam
ISI-20183	Flow Diagram - Condensate & Boiler Pump Feed Suction
ISI-20193	Flow Diagram - Boiler Feedwater
ISI-20253	Flow Diagram - Condenser Air Removal and Box Priming
ISI-20333	Flow Diagram - Service Water System
ISI-20353	Flow Diagram - Station Air
ISI-20363	Flow Diagram - Instrument Air
ISI-20413	Flow Diagram - Main Steam Traps
ISI-26533	Flow Diagram - Post Accident Containment Sampling
ISI-27193	Flow Diagram - Waste Disposal System (Sheets 1 & 2)
ISI-27203	Flow Diagram - Auxiliary Coolant
ISI-27223	Flow Diagram - Service Water System Nuclear Steam Supply Plant
ISI-27233	Flow Diagram - Nitrogen to Nuclear Equipment
ISI-27243	Flow Diagram - Primary Make-Up Water System
ISI-27263	Flow Diagram - Penet. & Liner Weld Joint Press. System
ISI-27293	Flow Diagram - Steam Generator Blowdown (Sheets 1 & 2)
ISI-27353	Flow Diagram - Safety Injection System
ISI-27363	Flow Diagram - Chemical & Volume Control
ISI-27383	Flow Diagram - Reactor Coolant System
ISI-27453	Flow Diagram - Sampling System
ISI-27463	Flow Diagram - Isolation Valve Seal Water System
ISI-27473	Flow Diagram - Reactor Coolant System
ISI-27503	Flow Diagram - Safety Injection System
ISI-27513	Flow Diagram - Auxiliary Coolant System (Sheets 1 & 2)
ISI-40223	Flow Diagram - Ventilation System for Containment Primary Auxiliary Building
ISI-70453	Radiation Monitoring Installation Details Instrumentation

NOTE: CC and MC components are described in Steps 4.1.1.1 through 4.1.1.5 of this procedure. Consult with the R/R Coordinator or ISI Coordinator for further details.

SECTION XI APPLICABILITY DECISION TREE



SECTION XI TRAVELLER

1. W.R/MOD.#:_____ 2. REPAIR/REPLACEMENT#_____

3a. COMPONENT DESCRIPTION:_____ 3b. COMPONENT ID:_____

3c. COMPONENT SIZE (NPS)_____ 3d. ISI DWG COORDINATES _____ 3e. ISI DWG NO._____

4. QA CATEGORY:_____ 5. ISI CLASS:_____ 6a. SYSTEM:_____ 6b. SUBSYSTEM:_____

7. DESCRIPTION OF: ☐ REPAIR ☐ REPLACEMENT or ☐ MAINTENANCE _____

8. REASON FOR REPAIR/REPLACEMENT:_____

CODES/STANDARDS & DESIGN SPECS. (REPAIRS/REPLACEMENTS ONLY)

NOTE: All repair/replacement activities (except those related to subsections IWE & IWL) shall be in accordance with ASME Section XI 1989 Edition No Addenda. IWE/IWL Repair/Replacement activities shall be in accordance with ASME Section XI 1992 Edition, including addenda.

9. ORIG. CONST. CODE: ☐ B31.1_____ ADD_____ ☐ SECT. III_____ ADD_____ ☐ OTHER_____

10. R/R CONST. CODE:_____

11. RECONCILIATION OF DIFFERENCES BETWEEN ORIGINAL AND NEW COMPONENT ITEMS:_____

DEFECT INFORMATION (Repairs Only)

12. DESCRIPTION OF FLAW: _____

13. NDE METHOD USED TO DETECT FLAW:_____ 14. FLAW REMOVAL METHODS ☐ THERMAL ☐ MECH.

15. METHOD OF CAVITY MEASUREMENT: _____

16. DIMENSIONAL REQUIREMENTS FOR REFERENCE POINTS DURING AND AFTER REPAIR: _____

VERIFICATION OF APPLICABILITY (REPAIRS/REPLACEMENTS ONLY)

17. EVALUATION OF CAUSE OF FAILURE/SUITABILITY OF REPAIR/REPLACEMENT/SUITABILITY OF WELD PROCESS (IWA-4130, IWA-7220):_____

SECTION XI POST-REPAIR/REPLACEMENT/MAINTENANCE REQUIREMENTS

18a. PRESSURE TEST: YES ☐ NO ☐ 18b. PROCEDURE NO._____

19. IST REQUIREMENTS (IWV, IWP):_____

20. PRESERVICE INSPECTION/ISI REQUIREMENTS:_____

21. CONCRETE INSPECTION REQUIREMENTS (for concrete repair/replacement only):_____

REVIEW CYCLE

22. PLANNER/INITIATOR/COGNIZANT ENGINEER/Date: _____

23. ISI COORDINATOR/Date:_____

24. IST ENGINEER/Date:_____

25. CONCRETE ENGINEER/Date (if required):_____

26. ANII/ANI REVIEW/NOTIFICATION/Date (if required):_____

27. QS DEPT/Date (if required):_____

28. R/R COORDINATOR/Date (if required):_____

GUIDE FOR COMPLETING SECTION XI TRAVELLER

NOTE: Unless otherwise stated, initiator/planner is responsible for completion of all items. ROME system electronic routing can be used to document required approval in lieu of hard copy signatures.

NOTE: Unless specifically identified, all references to Section XI requirements refers to the 1989 Edition, No Addenda of the Code. All Class MC and CC repair/requirements shall be in accordance with the 1992 Edition including Addenda of Section XI, subsections IWA, IWE, IWL.

FOR ALL SECTION XI COMPONENTS, INITIATOR/WORK PACKAGE PLANNER SHALL FILL OUT:

1. Work Request Number and/or Modification Number, if applicable.

2. Repair/Replacement number to be issued by R/R Coordinator (only needed for repair/replacement, "N/A" for maintenance activities).

3. Description of Component and Component ID, Component Size (NPS, Diameter of pipe, valve, etc.) ISI drawing number for components, and drawing coordinates.

4. QA Category: Determined from Plant Equipment Data Base or other plant document.

5. ISI Class: Determined from ISI Boundary Drawings, and/or consultation with the ISI Coordinator.

6. System and Subsystem to be determined from Plant Equipment Data Base.

7. Indicate if repair, replacement, or maintenance (Attachment B) and give a brief description of type of work to be performed.

8. Provide reason for repair or replacement ("N/A" for maintenance activities). Reason for replacements may include (a) discrepancies detected during inservice inspection; (b) regulatory requirement changes; (c) design changes to improve service life; (d) changes to improve reliability; (e) damage; (f) failure during service; (g) personnel exposure; (h) economics; (i) end of service life.

ITEMS 9, 10, AND 11 ARE REQUIRED FOR REPAIRS/REPLACEMENTS ONLY:

9. The original construction code or design specification used to fabricate component as determined from FSAR, Design Basis Document, original procurement and installation spec's, component nameplate data, etc.

10. Year and addenda of construction code or design specification used to perform repair/replacement activity if different from original const. code or design specification. (as per IWA - 4120 and IWA-7210).

11. For replacements, provide reconciliation of differences between original and new component in accordance with IWA-7210 (may be referenced to engineering document).

12. For a repair activity: description of flaw, i.e., crack, corroded area, pinhole leak, surface indication which exceeds Section XI Acceptance Criteria (IWA-3000, IWL-3000), etc.

13. For a repair activity: NDE method used to detect flaw: i.e., UT, MT, PT, RT or Visual.

GUIDE FOR COMPLETING SECTION XI TRAVELLER

14. For a repair: flaw removal method.

15. For a repair: detail instructions for measurement of cavity created by removing flaw.

16. For a repair: requirements for ref. points during and after repair (this should correspond with NDE data used to detect flaw and verify its removal)

17. Document the evaluation of the suitability of the repair or replacement ("N/A" for maintenance activities) based on cause of failure in accordance with IWA-4130 or IWA-7220. If the evaluation is to be performed as part of a DER response, indicate DER number. IF this is a modification, indicate mod number (the initiator/work package planner should consult with the responsible engineer or the R/R Coordinator for this step).

18. To be completed by Inservice Testing Engineer; determine if press. test is required (IWA-4400) Indicate procedure no. or re-test work request number as applicable.

19. To be completed by the Inservice Testing Engineer. Indicate any post-maintenance pump & valve test which are required (IWP-3111 and IWV-3200)

20. To be completed by ISI Coordinator or his designee; Section XI Preservice Inspection Requirements as determined from IWB-2200, IWC-2200, IWD-2100, IWF-2200, IWE-2200 (1992 ed.), IWL-2200 (1992 ed.). The ISI Coordinator shall enter PID No. or ACTs No. for planned corrective action if programmatic changes are required due to "like-in-kind" replacement.

21. To be completed by Concrete Engineer. Indicate any concrete or metal containment repair/replacement requirements.

22. Printed name and signature of planner/initiator.

23. Signature and date of ISI Coordinator/designee indicating Preservice Inspection/ISI requirements.

24. Signature and date of Inservice Testing Engineer indicating pressure test and IST requirements.

25. For concrete repairs only: Signature and date of Concrete Engineer indicating all CC applicable requirements, if required.

26. For repairs/replacement only: Signature and date of ANII/ANI indicating initial notification/review (R/R Coordinator may sign for ANII notification).

27. For repairs/replacement only: Signature and date of QS Department personnel, indicating review and approval of R/R Traveller.

28. For repairs/replacement only: Signature and date of R/R Coordinator indicating review of R/R activity and completion of NIS-2 data report (NIS-2 Report is not required for maintenance activities).

GUIDE FOR COMPLETING FORM NIS-2

NOTE: NIS-2 Form is required for repairs/replacements only (not needed for maintenance activities).

1. The date this Form was prepared.

2. The name and address of the organization responsible for completing the repair or replacement activity. When the organization responsible for the repair or replacement holds a Certificate of Authorization, the name and address of the organization shall be the same as shown on the Certificate of Authorization.

3. A unique identification of the repair or replacement enabling the work to be identified.

4. The unique designation of the system in the nuclear power plant, by name, including the ASME Class of system.

5. (a) The Section of the ASME Code or other standard, (e.g., ANSI B31.1, Draft Pump and Valve Code) that the item was manufactured in accordance with, including the year of publication, the designation of the addenda of the standard in effect, and any applicable Cases identified by number.

   (b) The Edition and Addenda of Section XI used for the repair or replacement.

6. The name of the item repaired or replaced taken from the Data Report provided by the manufacturer or from plant records when no Data Report exists for the item.

7. The name of the manufacturer of the item repaired or replaced taken from the Data Report describing the item. Alternatively, the name of the manufacturer or the installer of the item taken from the plant records when no Data Report exists for the item.

8. The serial number, if applicable, of the item taken from the Data Report provided by the manufacturer or from plant records when no Data Report exists for the item.

9. The National Board Number assigned to the item by the manufacturer taken from the Data Report or item, if applicable.

10. Other appropriate identification, (e.g., State or Province number, plant assigned designator) taken from drawings or other records.

11. The year the item was manufactured, taken from the Date Report representing the item or its nameplate as appropriate, or the date of installation taken from plant records when no Data Report exists for the item.

12. Indicate the action taken on the item: repaired, replaced, or replacement.

13. Indicate if the item bears an ASME Code Symbol Stamp.

14. A brief narrative of the work performed.

GUIDE FOR COMPLETING FORM NIS-2

15. Indicate the appropriate pressure test completed following the repair or replacement, or denote exemption. Record the test pressure and temperature of the component during the pressure test, if applicable.

16. Additional information necessary to describe the repair or replacement not otherwise convened in the Form NIS-2. Manufacturer's Data Reports for replacement items included in the repair or replacement should be identified and attached to this Form. Describe any change to the original construction requirements.

NOTE:
Manufacturer's Data Reports for the item being replaced need not be included.

17. Indicate if the activity performed is repair or replacement.

18. The signature of the individual and title representing the Owner (typically the R/R Coordinator) who certified the accuracy of the contents of the Form NIS-2 and its attachments, including the date this document was signed.

19. The name of the jurisdiction (State or Province) where the repairs or replacements were performed.

20. The name of the Inspector's employer, the Authorized Inspection Agency.

21. The address of the Authorized Inspection Agency (City/Town and State or Province).

22. The date the Authorized Nuclear Inservice Inspector began verification that the activities represented by this Form NIS-2 were completed.

23. The last date the Authorized Nuclear Inservice Inspector verified the activities represented by this Form NIS-2.

24. The Authorized Nuclear Inservice Inspector's signature.

25. The Authorized Nuclear Inservice Inspector's National Board Commission Number, including endorsements, and if applicable, the jurisdiction name and Certificate of Competency number held in the State or Province where inspections represented by this Form NIS-2 were performed.

26. The date (month, day, year) the Authorized Nuclear Inservice Inspector signed the Form NIS-2.

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS
As Required by the Provisions of the ASME Code Section XI

Owner New York Power Authority
Name

123 Main Street, White Plains N.Y. 10601
Address

Plant Indian Point #3
Name

P.O. Box 215, Buchanan N.Y. 10511
Address

Work Performed by: _____
Name

_____
Address

_____
Work Order No., MOD No., etc.

Identification of System: _____

Applicable Construction Code _____ 19____ Edition, _____ Addenda, _____ Code Case

Applicable Edition of Section XI Utilized for Repairs or Replacements 19 ____ Edition, _____ Addenda

Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufact. Serial No.	National Board No.	Other I.D.	Year Built	Repaired, Replaced or, Replacement	ASME Code Stamped (YES/NO)

Description of Work _____

Tests Conducted: Hydrostatic ☐ Pneumatic ☐ Nominal Operating Pressure ☐
Other ☐ Pressure _____ psi Test Temp. _____ °F

Remarks _____

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this _____ conforms to the rules of the ASME Code, Section XI.
repair or replacement

Signed _____, Date _____, 19 _____
Owner or Owner's Designee, Title

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of _____ and employed by _____ have inspected the components described in this Owner's Report during the period _____ to _____, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's 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 Owner's 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.

_____
Inspector's Signature

Commissions _____
National Board, State Province, and Endorsements

Date _____ 19_____

FORM NIS-2 OWNER'S REPORT FOR REPAIRS OR REPLACEMENTS
As Required by the Provisions of the ASME Code Section XI

Owner New York Power Authority (Name)
123 Main Street, White Plains N.Y. 10601 (Address)

Plant Indian Point #3 (Name)
P.O. Box 215, Buchanan N.Y. 10511 (Address)

Work Performed by: (2) (Name)
(Address)

(3) (Work Order No., MOD No., etc.)

Identification of System (4)

Applicable Construction Code (5a) 19 ____ Edition, ____ Addenda, ____ Code case

Applicable Edition of Section XI Utilized for Repairs or Replacements 19 (5b) Edition, ____ Addenda

Identification of Components Repaired or Replaced and Replacement Components

Name of Component	Name of Manufacturer	Manufact. Serial No.	National Board No.	Other I.D.	Year Built	Repaired, Replaced or, Replacement	ASME Code Stamped (YES/NO)
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

Description of Work (14)

Tests Conducted: (15) Hydrostatic ☐ Pneumatic ☐ Nominal Operating Pressure ☐
Other ☐ Pressure ____ psi Test Temp. ____ °F

Remarks (16)

CERTIFICATE OF COMPLIANCE

We certify that the statements made in the report are correct and this (17) repair or replacement conforms to the rules of the ASME Code, Section XI.

Signed (18) *Owner or Owner's Designee, Title* , Date ____ , 19 ____

CERTIFICATE OF INSERVICE INSPECTION

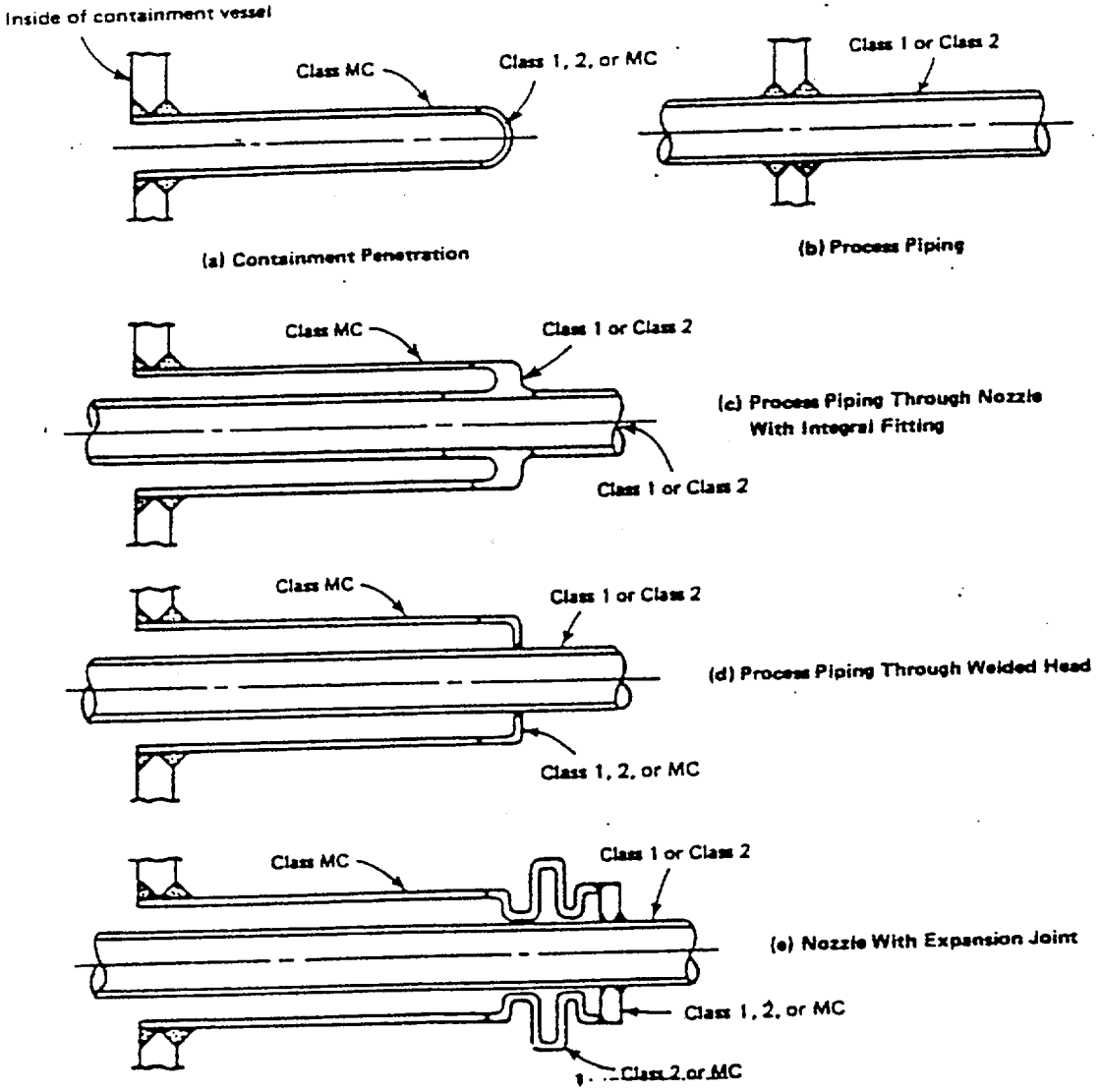
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of (19) and employed by (20) of (21) have inspected the components described in this Owner's Report during the period (22) to (23), and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's 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 Owner's 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.

(24) *Inspector's Signature*

Commissions (25) *National Board, State Province, and Endorsements*

Date ____(26)____ 19____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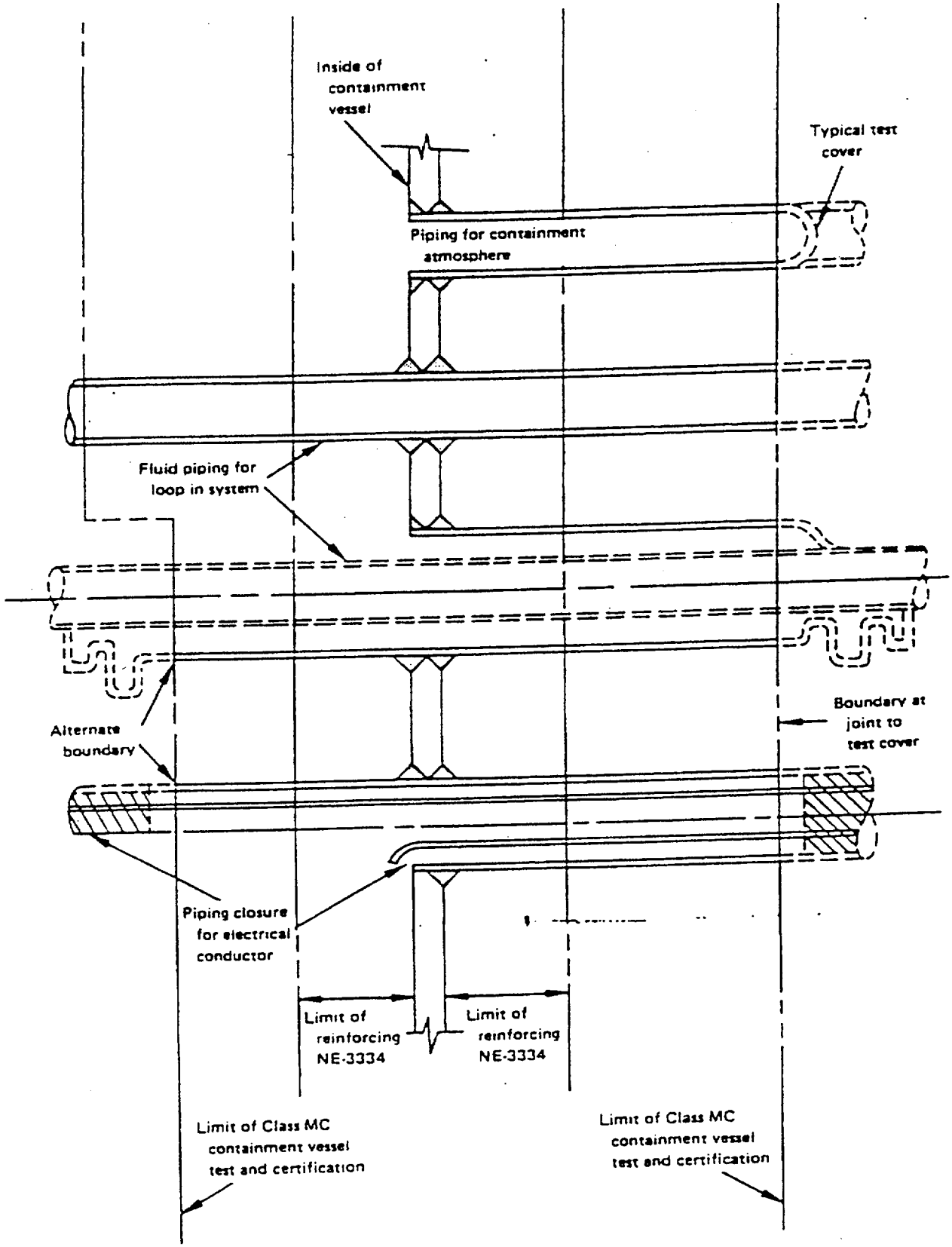
Class MC
Class 1, 2, or MC
(a) Containment Penetration
Class 1 or Class 2
(b) Process Piping
Class MC
Class 1 or Class 2
Class 1 or Class 2
(c) Process Piping Through Nozzle With Integral Fitting
Class MC
Class 1 or Class 2
Class 1, 2, or MC
(d) Process Piping Through Welded Head
Class MC
Class 1 or Class 2
Class 1, 2, or MC
Class 2 or MC
(e) Nozzle With Expansion Joint
Inside of containment vessel
Class MC
(f) Electrical or Mechanical Penetration Assembly


Inside of containment vessel
Typical test cover
Piping for containment atmosphere
Fluid piping for loop in system
Alternate boundary
Boundary at joint to test cover
Piping closure for electrical conductor
Limit of reinforcing NE-3334
Limit of reinforcing NE-3334
Limit of Class MC containment vessel test and certification
Limit of Class MC containment vessel test and certification

INFORMATION ONLY

Entergy

Control Copy: 406

Procedure Use Is:

Effective Date: 3/13/2001

☐ Continuous

Page 1 of 25

☐ Reference

Indian Point 3

■ Information

■ TSR
☐ NTSR

AP-49, Revision 5

INSERVICE INSPECTION PROGRAM

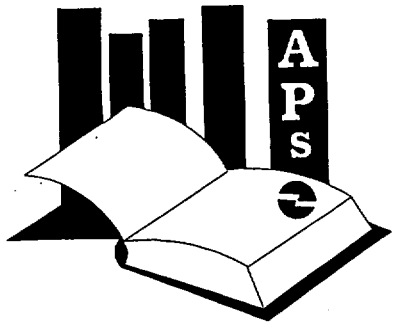
INFORMATION ONLY

Approved By:

Vice President, Operations — Date 3/7/01

Director, Engineering Programs — Date 3/5/01

INDIAN POINT 3
ADMINISTRATIVE
PROCEDURES



EDITORIAL Revision

1. REASON FOR REVISION

1.1 A new procedure is in place to establish a method for determining the appropriate regulatory and/or other processes/programs that are required for implementing an activity. The new procedure, AP-66, must be used as a screening device instead of MCM-4 as required previously.

2. SUMMARY OF CHANGES

2.1 Replaced MCM-4, Safety Screen with AP-66, Process Applicability Screen in paragraphs 4.1.1.6.6 and 4.1.3.6.6.

2.2 Deleted paragraphs 4.1.1.6.7 and 4.1.3.6.7.

2.3 Added Interface Document, AP-66, Process Applicability Screening in paragraph 7.3.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To establish administrative controls for implementing the following programs at Indian Point 3 (IP3):

A. The IP3 Inservice Inspection (ISI) Program for surface, volumetric, and visual inspections of ISI Class 1, 2, and 3 piping systems as required by ASME Section XI Code of Record. **{Reference 7.1.1}**.

B. The IP3 Flow Accelerated Corrosion (FAC) program for inspecting piping systems susceptible to FAC as required by Generic Letter 89-08 **{Reference 7.2.5}**.

> **NOTE**
> FAC was previously referred to as Erosion/Corrosion.

C. The IP3 Containment Inservice Inspection Program for Class MC and CC components. **{Reference 7.1.5}.**

D. The IP3 balance of plant (BOP) heat exchanger eddy current program for inspecting heat exchanger tubing in plant heat exchangers other than the steam generators.

1.1.1 The administrative controls for other programs within the scope of ASME Section XI are contained in Attachment 1, "Administrative Controls for Programs within the Scope of ASME Section XI".

1.2 This procedure implements the requirements of the IP3 Quality Assurance Program, as specified in the IP3 FSAR, Sections 17.2.4, 17.2.5, 17.2.6, 17.2.7, 17.2.9, 17.2.10, 17.2.12, 17.2.15, 17.2.16, 17.2.17

2.0 PRECAUTIONS and LIMITATIONS

None

3.0 PREREQUISITES

None

4.0 PROCEDURE

4.1 Specific Instructions/Requirements

4.1.1 ISI for Class 1, 2, 3 systems and components

4.1.1.1 Under the provisions of 10CFR50.55a and IP3 technical specifications, IP3 is responsible for performing inservice inspection on components classified as ISI Class 1, 2, and 3. These inspections must be performed in accordance with ASME Section XI requirements.

4.1.1.2 The classification of piping systems and components as ISI Class 1, 2, and 3 is performed in accordance with Regulatory Guide 1.26 and 10CFR50.2. ISI flow diagrams are listed in Attachment 2, "ISI Flow Diagrams" for the ISI Class 1, 2, and 3 piping systems and components.

4.1.1.3 Systems and components which are not code classified but are important to safety come under the heading 'Augmented Inservice Inspections' and are included in the ISI program.

4.1.1.3.1 Augmented inspections may also include commitments made to the Nuclear Regulatory Commission or the examination of code classified systems more frequently than required by the code.

4.1.1.4 All repairs, replacements, or modifications to ISI Class 1, 2, and 3 piping systems and components shall be performed in accordance with AP-39 **{Reference 7.3.4}**.

4.1.1.5 IP3 is required by ASME Section XI to maintain the services of an Authorized Nuclear Inservice Inspector (ANII) to review the ISI program. During normally scheduled outages and for minor repairs (i.e. grinding surface indications or tightening bolts/nuts on supports) ANII review will consist of, unless otherwise required by the ANII, a review of ISI NDE data sheets after the corrective action has been performed. The ANII shall perform his duties as required by ASME XI.

4.1.1.6 Development and revision of the ISI program is to conform to NRC regulations concerning both ASME code and augmented inspections as well as approved associated relief requests. The development and revision of the ISI program shall be performed in accordance with Nuclear Engineering Administrative Procedure 26 **{Reference 7.3.10}**, 'Administrative Controls for Containment, Weld and Support Inspection and FAC Programs at IP3 and JAF Nuclear Power Plants'. Relief requests shall be submitted via the licensing process and incorporated into the ISI program only upon approval from the NRC. The specific process for developing and revising the ISI program shall be as follows:

4.1.1.6.1 The *Responsible Engineer (RE)* shall develop the IP3 ISI program to conform to NRC requirements and the appropriate edition and addenda of the ASME code.

4.1.1.6.2 All required changes, except minor administrative or editorial changes which shall follow steps 4.1.1.6.10 through 4.1.1.6.11, to the ISI program shall be incorporated into a draft revision by the *RE*. R

4.1.1.6.3 The *RE* shall incorporate required changes to the ISI Program Manual by making proposed revisions in accordance with AP-3 'Procedure Preparation, Review and Approval' and AP-4 'Procedure Use and Adherence'.

> **NOTE**
> Relief from ASME XI Code requirements during the 10 year ISI interval will be via an NRC Relief Request which shall be prepared by the IP3 Licensing Group.

4.1.1.6.4 The proposed revision shall be reviewed by:

- Director – Engineering Programs
- ISI Peer Review

4.1.1.6.5 Comments resulting from the review shall be resolved and incorporated as necessary, into the proposed revision of the ISI program manual.

4.1.1.6.6 AP-66, Process Applicability Screen shall be performed. R

> **NOTE**
> The following steps only need to be followed for ISI program changes which require submittal to the NRC. All other revisions shall be issued through Configuration Management.

R

4.1.1.6.7 Approved revisions are sent to the Licensing Manager – IP3 for submittal to the NRC, if required.

4.1.1.6.8 The revision shall NOT be incorporated into the ISI program until approval has been obtained from the NRC.

4.1.1.6.9 Upon NRC approval, the revision shall be issued through Configuration Management.

4.1.1.6.10 Minor administrative or editorial type changes may be implemented upon approval by the Director – Engineering Programs or designee.

4.1.1.6.11 These interim minor changes shall be documented in accordance with NEAP-26 requirements**{Reference 7.3.10}**, and shall be incorporated into the next revision of the ISI Program Plan.

4.1.2 Flow Accelerated Corrosion

4.1.2.1 Due to concerns raised in NRC Bulletin 87-01, Generic Letter 89-08, and other industry reports, IP3 has committed to an inspection program that will identify evidence of wall thinning in both safety related and non-safety related systems. The IP3 response **{Reference 7.1.4}** to Generic Letter 89-08 listed the susceptible piping systems which would be evaluated for inclusion in the FAC program. A list of susceptible systems is contained in Attachment 3, 'Indian Point 3 Nuclear Power Plant Erosion/Corrosion Program IP3 Piping Systems'.

4.1.2.2 The *RE* shall develop and revise the Flow Accelerated Corrosion program as necessary to incorporate industry and in-house experiences. The FAC program is documented in the following engineering reports:

A. Extraction Steam System: IP3-RPT-EX-00911
B. Condensate System: IP3-RPT-COND-00912
C. Moisture Preseparator Drain System: IP3-RPT-HD-00913
D. Heater Drain System: IP3-RPT-HD-00979
E. Feedwater System: IP3-RPT-HD-00984
F. Reheater Drain System: IP3-RPT-HD-01144
G. Moisture Separator Drain System: IP3-RPT-MSD-01158
H. Historical Inspection Data: IP3-RPT-MULT-01471
I. Small Bore & Augmented Piping Program: 0090-00064.000-1

4.1.2.2.1 Revisions to these engineering reports shall be in accordance with the DCM process.

4.1.3 ISI for Containment Class MC and CC Components

4.1.3.1 Under the provisions of 10CFR50.55a and IP3 technical specifications, IP3 is responsible for performing inservice inspection on components classified as ISI Class MC and CC. These inspections must be performed in accordance with the ASME Section XI requirements as described in the IP3 Containment Inservice Inspection Program **{Reference 7.1.5}.**

4.1.3.2 The classification of systems and components as ISI Class MC and CC is performed in accordance with Regulatory Guide 1.26, 10CFR50.55a, and the NRC rule making. ISI flow diagrams are listed in Attachment 2 and identify the ISI Class MC and CC components.

4.1.3.3 Systems and components which are not code classified, but are important to safety, come under the heading "Augmented Inservice Inspections" and may

be included in the Containment ISI program as needed.

4.1.3.3.1 Augmented inspections may also include commitments made to the Nuclear Regulatory Commission or the examination of code classified systems more frequently than required by the code.

4.1.3.4 All repairs, replacements, or modifications to ISI Class MC and CC components shall be performed in accordance with AP-39 **{Reference 7.3.4}**.

4.1.3.5 IP3 is required by ASME Section XI to maintain the services of an Authorized Nuclear Inservice Inspector (ANII) to review the ISI program. During normally scheduled outages and for minor repairs (i.e. grinding surface indications or tightening bolts/nuts on supports) ANII review will consist of, unless otherwise required by the ANII, a review of ISI NDE data sheets after the corrective action has been performed. The ANII shall perform his duties as required by ASME XI.

4.1.3.6 Development and revision of the Containment ISI program is to conform to NRC regulations concerning both ASME code and augmented inspections as well as approved associated relief requests. The development and revision of the Containment ISI program shall be performed in accordance with Nuclear Engineering Administrative Procedure 26 **{Reference 7.3.10}**, 'Administrative Controls for Containment, Weld and Support Inspection and Erosion/Corrosion Programs at IP3 and JAF Nuclear Power Plants'. Relief requests shall be submitted via the licensing process and incorporated into the Containment ISI program only upon approval from the NRC. The specific process for developing and revising the Containment ISI program shall be as follows:

4.1.3.6.1 The *Responsible Engineer (RE)* shall develop the IP3 Containment ISI program to conform to NRC requirements and the appropriate edition and addenda of the ASME code.

4.1.3.6.2 All required changes, except minor administrative or editorial changes which shall follow steps 4.1.3.6.10 through 4.1.3.6.11, to the Containment ISI program shall be incorporated into a draft revision by the *RE*. R

4.1.3.6.3 The *RE* shall incorporate required changes to the Containment ISI Program Manual by making proposed revisions in accordance with AP-3 'Procedure Preparation, Review and Approval' and AP-4 'Procedure Use and Adherence'.

NOTE

Relief from ASME XI Code requirements during the 10 year ISI interval will be via an NRC Relief Request which shall be prepared by the IP3 Licensing Group.

4.1.3.6.4 The draft revision shall be reviewed by:

- Director – Engineering Programs
- ISI Peer Review

4.1.3.6.5 Comments resulting from the review shall be resolved and incorporated, as necessary, into the proposed revision of the Containment ISI program manual.

4.1.3.6.6 AP-66, Process Applicability Screen shall be performed. R

NOTE

The following steps only need to be followed for Containment ISI program changes which require submittal to the NRC. All other revisions shall be issued through Configuration Management.

R

4.1.3.6.7 Approved revisions are sent to the Licensing Manager – IP3 for submittal to the NRC, if required.

4.1.3.6.8 The revision shall NOT be incorporated into the Containment ISI program until approval has been obtained from the NRC.

4.1.3.6.9 Upon NRC approval, the revision shall be issued through Configuration Management.

4.1.3.6.10 Minor administrative or editorial type changes may be implemented upon approval by the Director – Engineering Programs or designee.

4.1.3.6.11 These interim minor changes shall be documented in accordance with NEAP-26 requirements **{Reference 7.3.10}**, and shall be incorporated into the next revision of the ISI Program Plan.

4.1.4 Balance of Plant Eddy Current Program

4.1.4.1 IP3 performs inspections on Balance of Plant (BOP) heat exchangers to monitor the condition of the heat exchanger tubing and to ensure the structural integrity of the tube material. This minimizes costly plant shutdown and possible cross contamination of systems.

4.1.4.2 The *RE* shall ensure BOP heat exchangers are eddy current inspected on a schedule reflective of their service conditions, past inspection history, and consequence of failure.

4.1.4.3 BOP heat exchangers are eddy current inspected as part of the IP3 Preventive Maintenance (PM) program contained in AP-55, 'Preventive Maintenance Program'. Any changes to the frequency or scope of the eddy current inspections must be addressed through the PM program.

4.2 Implementation

4.2.1 ISI

4.2.1.1 The *RE* shall develop the inspection scope for an upcoming outage by ensuring:

A. Code requirements are met in terms of schedule, percentage inspected, and examination method.

B. Program requirements are met in those cases where exceptions or relief from the code are used.

C. Augmented inspection requirements are satisfied.

4.2.1.2 The *RE* shall then submit the scope of inspection to the outage manager, if required, for his review and approval.

4.2.1.3 The *RE* shall develop an inspection list detailing each inspection point and type of inspection required. WRs shall be generated in ROME for work packages. If ISI or eddy current testing is preventive maintenance, PIDs do NOT have to be written.

4.2.1.4 The *RE* shall submit a copy of the inspection list to the ANII, the ISI Vendor, and the NRC (when required) prior to outage commencement.

4.2.1.5 The *RE* shall develop an inspection checklist from the inspection list to ensure that each examination required to be performed can be tracked during the outage.

4.2.1.5.1 The *RE*, the *Site NDE Level III*, and the *ISI vendor* shall review the checklist prior to the outage. Each inspection required shall be listed separately in the checklist.

4.2.1.6 The *RE* shall interface with the Construction Services and R.E.S. Departments to ensure adequate technical and craft personnel are on hand to provide required support services.

4.2.1.7 The *RE* shall obtain all vendor personnel and equipment certification packages, and examination procedures and forward them to the *Site NDE Level III* for his review and approval prior to the outage.

4.2.1.8 The *RE* shall also submit all vendor personnel and equipment certification packages and examination procedures to the ANII for review and approval.

4.2.1.9 The *RE* shall ensure the proper calibration blocks are available on site.

4.2.1.10 The *RE* shall be the primary on-site interface with vendor examination personnel to ensure they receive the required training in, and conform to, the plants radiological, safety, and work guidelines.

4.2.1.11 The *RE* shall ensure all vendor examination results and data sheets are reviewed and signed by the *Site NDE Level III*.

4.2.1.12 The *Site NDE Level III/RE* shall report any discrepancies to Plant Management by issuing a DER.

4.2.1.13 The *RE* shall determine the need for additional inspections and re-inspections due to discovered discrepancies.

4.2.1.14 Upon completion of any evaluations required as a result of discrepancies, and after the data sheets have been reviewed and signed by the Site NDE Level III, the *RE* shall submit the data sheets and evaluations to the ANII for review.

4.2.1.15 The *RE* shall ensure all scheduled inspections have been completed prior to plant start up.

4.2.1.16 Upon completion of all inspections, and prior to plant start up, the *RE and/or his designee* shall perform a walkdown and inspection of all affected piping supports, components, etc., to ensure insulation has been reinstalled, scaffolding removed, and a satisfactory clean up has been performed.

4.2.2 Flow Accelerated Corrosion

4.2.2.1 The *RE* shall develop a list of components and piping segments to be inspected prior to each outage in accordance with Reference 7.2.13. This list will be based on the results of the computer analysis, as documented in the engineering reports, any previously detected wear, and any applicable industry experience.

4.2.2.2 The *RE* shall interface with Construction Services and radiological control personnel to ensure adequate technical and craft personnel are on hand to provide required support services during the outage.

4.2.2.3 Quality Assurance NDE procedure(s) shall be used for all ultrasonic wall thickness measurements. Vendor procedures may be used if approved by the *RE and NYPA Site NDE Level III.*

4.2.2.4 The *Site NDE Level III* shall review and sign all data sheets generated by inspection personnel.

4.2.2.5 After the *Site NDE Level III* has reviewed and signed the data sheets, the *RE* shall review and sign each data sheet.

4.2.2.6 The *RE* shall determine the need to perform additional inspections as a result of any wall thinning detected during the inspection. The additional inspection sample shall be in accordance with the requirements of Reference 7.2.13.

4.2.2.7 An independent review of all inspection data shall be performed by a *NYPA engineer or designee.*

4.2.2.8 The *RE* shall ensure that all components scheduled for inspection have been completed prior to plant start up.

4.2.2.9 Upon completion of all inspections, and prior to plant start up, the *RE and/or his designee* shall perform a walkdown and inspection of all affected components to ensure insulation has been reinstalled, scaffolding removed, and a satisfactory clean up has been performed.

4.2.3 Containment ISI

4.2.3.1 The *RE* shall develop the inspection scope for an upcoming outage by ensuring:

A. Code requirements are met in terms of schedule, percentage inspected, and examination method.

B. Program requirements are met in those cases where exceptions or relief from the code are used.

C. Augmented inspection requirements are satisfied.

4.2.3.2 The *RE* shall then submit the scope of inspection to the outage manager, if required, for his review and approval.

4.2.3.3 The *RE* shall develop an inspection list detailing each inspection point and type of inspection required. WRs shall be generated in ROME for work packages. If ISI or eddy current testing is preventive maintenance, PIDs do NOT have to be written.

4.2.3.4 The *RE* shall submit a copy of the inspection list to the ANII, the ISI Vendor, and the NRC (when required) prior to outage commencement.

4.2.3.5 The *RE* shall develop an inspection checklist from the inspection list to ensure that each examination required to be performed can be tracked during the outage.

4.2.3.5.1 The *RE*, the *Site NDE Level III*, and the *ISI vendor* shall review the checklist prior to the outage. Each inspection required shall be listed separately in the checklist.

4.2.3.6 The *RE* shall interface with the Construction Services and R.E.S. Departments to ensure adequate technical and craft personnel are on hand to provide required support services.

4.2.3.7 The *RE* shall obtain all vendor personnel and equipment certification packages, and examination procedures and forward them to the *Site NDE Level III* for his review and approval prior to the outage.

4.2.3.8 The *RE* shall also submit all vendor personnel and equipment certification packages and examination procedures to the ANII for review and approval.

4.2.3.9 The *RE* shall ensure the proper calibration blocks are available on site.

4.2.3.10 The *RE* shall be the primary on-site interface with vendor examination

personnel to ensure they receive the required training in, and conform to, the plants radiological, safety, and work guidelines.

4.2.3.11 The *RE* shall ensure all vendor examination results and data sheets are reviewed and signed by the *Site NDE Level III*.

4.2.3.12 The *Site NDE Level III/RE* shall report any discrepancies to Plant Management by issuing a DER.

4.2.3.13 The *RE* shall determine the need for additional inspections and re-inspections due to discovered discrepancies.

4.2.3.14 Upon completion of any evaluations required as a result of discrepancies, and after the data sheets have been reviewed and signed by the Site NDE Level III, the *RE* shall submit the data sheets and evaluations to the ANII for review.

4.2.3.15 The *RE* shall ensure all scheduled inspections have been completed prior to plant start up.

4.2.3.16 Upon completion of all inspections, and prior to plant start up, the *RE and/or his designee* shall perform a walkdown and inspection of all affected piping supports, components, etc., to ensure insulation has been reinstalled, scaffolding removed, and a satisfactory clean up has been performed.

4.2.4 Balance of Plant Eddy Current Program

4.2.4.1 The *RE* shall develop a list of heat exchangers to be inspected prior to each outage. This list will include

- all heat exchangers with active damage mechanisms as documented in the last inspection report,
- any heat exchangers which the system engineer requested to be inspected, and,
- any heat exchanger required by the Preventive Maintenance Program.

4.2.4.2 The *RE* shall submit the inspection scope to the Outage Manager for his review and approval.

4.2.4.3 The IP3 Maintenance Department Manager shall be responsible for opening and cleaning any heat exchangers requiring an eddy current inspection.

4.2.4.4 The *RE* shall ensure a contract is in place with a qualified vendor to perform eddy current inspections.

4.2.4.5 The *RE* shall be responsible for having all eddy current vendor procedures approved for use at IP3. The *QA Department* shall perform concurrence review and approval of vendor procedures and personnel certifications.

4.2.4.6 The *RE* shall review all inspection data and determine if any tubes need to be plugged, and if any adjustments are required to the eddy current inspection frequencies.

4.2.4.7 The *RE* shall maintain calibration tubes for all heat exchangers to be inspected.

4.2.4.8 The *RE* shall ensure on-line eddy current inspections are performed by the qualified vendor as scheduled.

4.3 Resolution of Reportable Indications

4.3.1 ISI

4.3.1.1 IF the *ISI vendor* finds a reportable indication, THEN the following steps shall be taken:

4.3.1.1.1 The *Site NDE Level III* shall perform a review of the examination performed within 72 hours and initiate additional examinations as required to provide the necessary information required for acceptance determination of the weld or component.

4.3.1.1.2 The *Site NDE Level III* shall determine acceptance by signature on the data sheet or rejection by initiating a DER for examination results which do not meet ASME Section XI code criteria.

4.3.1.1.2.a IF the reportable indication is within the Section XI acceptance range, THEN the *Site NDE Level III* shall process the closure of the Data Report and documents acceptance per the code requirements.

4.3.1.1.2.b IF the reportable indication is not within the Section XI acceptance range, THEN the DER is sent to the Director – Design Engineering for resolution.

4.3.1.1.3 IF the indication is repaired, THEN the *RE* shall ensure a re-inspection is performed prior to closure of the DER.

4.3.2 Flow Accelerated Corrosion

4.3.2.1 IF wall thinning, where less than 87.5% of nominal wall is remaining, is found on a Quality Category I or ISI Class 1, 2, or 3 piping, THEN a DER shall be initiated by the *RE* upon review and concurrence of the data. Evaluations shall be in accordance with 4.3.2.2.2 through .4.

4.3.2.2 IF wall thinning, where less than 87.5% of nominal wall is remaining, is found in any non-Quality Category I or non-ISI Class 1, 2, or 3 piping system, THEN the following steps shall be taken by the *RE*:

4.3.2.2.1 A DER will be initiated for all wall thinning below 70% of nominal wall.

4.3.2.2.2 The *RE* shall perform a structural evaluation of the wall thinning in accordance with Engineering Standards Manual CES-7 and DCM-2 for any thinning less than 87.5% of nominal wall.

4.3.2.2.3 IF the structural evaluation determines a repair or replacement is required, THEN the *RE* shall generate a DER and PID in accordance with AP-9, 'Work Control'.

4.3.2.2.4 IF the structural evaluation determines that the piping is acceptable but should be monitored, THEN the *RE* shall determine the frequency at which the piping is reinspected. A PID or ACTS item shall be generated to track future inspections.

4.3.3 Containment ISI

4.3.3.1 IF the *ISI vendor* finds a reportable indication, THEN the following steps shall be taken:

4.3.3.1.1 The *Site NDE Level III* and/or the Responsible Containment Engineer (or designee) shall perform a review of the examination performed within 72 hours and initiate additional examinations as required to provide the necessary information required for acceptance determination of the weld or component.

4.3.3.1.2 The *Site NDE Level III* shall determine acceptance by signature on the data sheet or rejection by initiating a DER for examination results which do not meet ASME Section XI code criteria.

4.3.3.1.2.a IF the reportable indication is within the Section XI acceptance range, THEN the *Site NDE Level III* shall process the closure of the

Data Report and documents acceptance per the code requirements.

4.3.3.1.2.b IF the reportable indication is not within the Section XI acceptance range, THEN the DER is sent to the Director – Design Engineering for resolution.

4.3.3.1.3 IF the indication is repaired, THEN the *RE* shall ensure a reinspection is performed prior to closure of the DER.

4.3.4 Balance of Plant Eddy Current

4.3.4.1.1 The *RE* shall inform the Maintenance Department of any tubes that need to be plugged or heat exchanger bundles requiring replacement.

4.4 Control of Inspection Reports

4.4.1 ISI

4.4.1.1.1 The *RE* shall submit a report of the inspections performed to the NRC in accordance with the following:

A. Within eight weeks of the completion of the examination, the *RE* shall collect all examination reports from vendor and in house examination personnel.

B. The *RE* shall review these reports for completeness and correctness.

C. The *RE* shall resolve any discrepancies with the QA department, ANII, and other site departments as required.

D. The *RE* shall then submit the report to the ANII for his review, approval, and signature on the NIS-1 form.

E. The *RE* shall then submit the NIS-1 and summary inspection report to the Plant Manager for his review, approval and signature on the NIS-1 form.

F. The report, including applicable NIS-2 or NIS-2A forms, shall then be submitted to the NRC via the Licensing group.

4.4.2 Flow Accelerated Corrosion

4.4.2.1 The *RE* shall provide an outage summary of inspection results to management and the system engineers.

4.4.3 Containment ISI

4.4.3.1 The *RE* shall submit a report of the inspections performed to the NRC in accordance with the following:

A. Within eight weeks of the completion of the examination, the *RE* shall collect all examination reports from vendor and in house examination personnel.

B. The *RE* shall review these reports for completeness and correctness.

C. The *RE* shall resolve any discrepancies with the QA department, ANII, and other site departments as required.

D. The *RE* shall then submit the report to the ANII for his review, approval, and signature on the NIS-1 form.

E. The *RE* shall then submit the NIS-1 and summary inspection report to the Plant Manager for his review, approval and signature on the NIS-1 form.

F. The report, including applicable NIS-2 or NIS-2A forms, shall then be submitted to the NRC via the Licensing group.

4.4.4 Balance of Plant Eddy Current

4.4.4.1 The *RE* shall ensure that within 90 days of the completion of the outage or inspection (non-outage), four (4) copies of the final eddy current inspection reports are received from the eddy current vendor. The *RE* shall review and accept the final report per the DCM process in a timely manner.

4.4.4.2 The *RE* shall maintain a copy of the inspection reports.

4.4.4.3 The *RE* shall ensure a copy of the inspection reports is distributed to the Maintenance Engineering department.

4.4.4.4 The *RE* shall ensure copies of the inspection reports are distributed to the appropriate system engineers.

5.0 RESPONSIBILITIES

5.1 The **Director – Engineering Programs (WPO)** shall be responsible for:

5.1.1 Designating a *RE* from the Engineering Programs Group in the WPO for the development and maintenance of the ISI, FAC, Steam Generator, and BOP Heat Exchanger programs.

5.1.2 Ensuring the ISI, FAC, Steam Generator, and BOP Heat Exchanger programs meet all ASME code, regulatory, and plant technical specification requirements.

5.2 The **General Manager - Maintenance** shall be responsible for:

5.2.1 Ensuring the ISI, FAC, Steam Generator, and BOP Heat Exchanger programs are conducted in accordance with this procedure.

5.3 The **Outage Manager** shall be responsible for:

5.3.1 Ensuring the proposed ISI, FAC, Steam Generator, and BOP Heat Exchanger work is incorporated into the overall outage schedule.

5.4 The **Construction Services Manager** shall be responsible for:

5.4.1 Ensuring adequate craft personnel are on hand to provide support services.

5.5 The **Director - Design Engineering** or designee shall be responsible for:

5.5.1 Reviewing the evaluation of discrepancies discovered during ISI.

5.5.2 Performing an engineering evaluation on any Quality Category I, ISI Class 1, 2, or 3 or BOP components where less than 87.5% of nominal wall is remaining in accordance with DCM-2 **{Reference 7.3.6}** and/or ESM CES-7 **{Reference 7.3.7}**.

5.6 The **Quality Assurance Manager** shall be responsible for:

5.6.1 Reviewing and approving all NDE data and evaluations generated via the signature of a *Site NDE Level III* on each data report.

5.6.2 Ensuring proper corrective action for each ISI discrepancy is initiated and completed through the use of DERs.

5.6.3 Verifying proper corrective action for all FAC wall thinning where less than 87.5% of nominal wall is remaining in Quality Category I or ISI Class 1, 2, or 3 piping is initiated and completed through the use of DERs by the *RE*.

5.6.4 Ensuring the *RE* is promptly notified of field discrepancies or Nonconformance of ISI NDE calibration blocks.

5.6.5 Monitoring the proper control, storage and maintenance of all ISI NDE calibration blocks through periodic surveillance.

5.6.6 Approving any field changes of ISI vendor procedures.

5.6.7 Auditing Vendor QA Program.

5.6.8 Verifying compliance of qualified processes/equipment per Appendices G and H of the EPRI PWR Steam Generator Examination guidelines.

5.6.9 Reviewing all personnel and equipment certifications.

5.7 The **Responsible Engineer (RE)** shall be responsible for:

5.7.1 ISI

5.7.1.1 Revising the ISI program to incorporate modifications to ISI Class 1, 2, or 3 piping, components, and their supports.

5.7.1.2 Ensuring the appropriate inspection is performed in accordance with the ASME Code, the ISI program, IP3 technical specifications, and any additional regulatory requirements that pertain.

5.7.1.3 Coordinating all on-site activities associated with the ISI program.

5.7.1.4 Coordinating the preparation and review of the final ISI outage report.

5.7.1.5 Coordinating the ISI repair program as a result of ISI deficiencies during plant outages.

5.7.1.6 Ensuring the proper control, storage and maintenance of all ISI NDE calibration blocks.

5.7.1.7 Ensuring that a current listing of ISI NDE calibration blocks is maintained detailing identification numbers, thickness, and material types. Retain records of calibration block design and fabrication.

5.7.1.8 Ensuring all work within radiological controlled areas is coordinated with health physics to ensure appropriate RWPs are utilized and all radiological requirements are met.

5.7.2 Flow Accelerated Corrosion

5.7.2.1 Ensuring that appropriate inspections are performed in accordance with the scope of this procedure.

5.7.2.2 Reviewing and signing all inspection data, and recommending repair/replacement of components.

5.7.2.3 Revising and expanding the scope of the FAC inspection program to

incorporate industry and in-house experiences.

5.7.2.4 Ensuring that all wall-thinning evaluations are performed prior to plant start up.

5.7.2.5 Initiating request for engineering services in accordance with AP-25.1 'Request for Engineering Services' for piping replacement, configuration changes to reduce the effect of erosion/corrosion, or material substitutions.

5.7.2.6 Periodically reviewing completed plant modifications to assess their effect on the FAC program.

5.7.3 Containment ISI

5.7.3.1 Revising the ISI program to incorporate modifications to ISI Class 1, 2, or 3 piping, components, and their supports.

5.7.3.2 Ensuring the appropriate inspection is performed in accordance with the ASME Code, the ISI program, IP3 technical specifications, and any additional regulatory requirements that pertain.

5.7.3.3 Coordinating all on-site activities associated with the ISI program.

5.7.3.4 Coordinating the preparation and review of the final ISI outage report.

5.7.3.5 Coordinating the ISI repair program as a result of ISI deficiencies during plant outages.

5.7.3.6 Ensuring the proper control, storage and maintenance of all ISI NDE calibration blocks.

5.7.3.7 Ensuring that a current listing of ISI NDE calibration blocks is maintained detailing identification numbers, thickness, and material types. Retain records of calibration block design and fabrication.

5.7.3.8 Ensuring all work within radiological controlled areas is coordinated with health physics to ensure appropriate RWPs are utilized and all radiological requirements are met.

5.7.4 Balance of Plant Heat Exchanger

5.7.4.1 Ensuring heat exchanger tubing is inspected appropriately.

5.7.4.2 Ensuring an eddy current contract is in place with a qualified vendor.

5.7.4.3 Reviewing all eddy current data and informing the Maintenance Department whenever tubes need to be plugged.

5.7.4.4 Maintaining all eddy current calibration tubes.

6.0 DEFINITIONS

6.1 ANI - Authorized Nuclear Inspector

6.2 ANII – Authorized Nuclear Inservice Inspector

6.3 DER – Deviation Event Report

6.4 "FAC" – (formerly Erosion/Corrosion) Flow Accelerated Corrosion process that causes pipe wall thinning in water or wet steam systems.

6.5 ISI – Inservice Inspection

6.6 ISI Class – Components are classified as ISI Class 1, 2, or 3 in accordance with Regulatory Guide 1.26 and 10CFR50.2.

6.7 NDE – Non-Destructive Examination

6.8 Category I – A system, part of a system, structure, and/or component shall be deemed Category I if its failure could cause a release of radioactivity exceeding the limits of the NRC regulations, or if it is vital to the safe shutdown of the Plant and the removal of decay and sensible heat, or if defined as Seismic Class I or Class II in Section 16.1.2 of the FSAR. (FSAR Section 16.1.7)

6.9 Non-Category I – A system, part of a system, and/or component shall be deemed Non-Category I if it is not essential for a safe shutdown, i.e., hot shutdown. Failures of this equipment could result in loss of power generation but would not endanger public safety. (FSAR Section 16.1.7)

7.0 REFERENCES

7.1 Commitment Documents

7.1.1 IP3-RPT-UNSPEC-03247, IP3 3rd Inspection Interval Program, July 21, 2000 through July 20, 2009

7.1.2 Indian Point 3 Technical Specifications, Section 4.2

7.1.2 [redacted]

7.1.3 NYPA Letter to NRC, IP3-87-055Z, September 15, 1987, Response to NRC Bulletin 87-01

7.1.4 NYPA Letter to NRC, IPN-89-044, dated July 21, 1989, Response to NRC Generic Letter 89-08, Erosion/Corrosion-Induced Pipe Wall Thinning

7.1.5 IP3-RPT-VC-03071, Containment Inservice Inspection, First Ten Year, Class MC and CC Program, 1998 - 2008

7.2 **Development Documents**

7.2.1 CFR 50.55a, Codes and Standards

7.2.2 NuREG-1344, Erosion/Corrosion Induced Pipe Wall Thinning in U.S. Nuclear Power Plants

7.2.3 NRC Bulletin No. 87-01, "Thinning of Pipe Walls in Nuclear Power Plants

7.2.4 NRC Information Notice 87-17, Summary of Responses to NRC Bulletin 87-01, "Thinning of Pipe Walls in Nuclear Power Plants"

7.2.5 NRC Generic Letter 89-08, Erosion/Corrosion - Induced Pipe Wall Thinning

7.2.6 EPRI CHECWORKS Erosion/Corrosion Computer Programs

7.2.7 NYPA Report IP3-RPT-COND-00912, Erosion/Corrosion Analysis of Condensate System Utilizing CHECMATE

7.2.8 NYPA Report, IP3-RPT-HD-00913, Erosion/Corrosion Analysis of Moisture Pre-separator Drains and Vents System Utilizing CHECMATE

7.2.9 NYPA Report, IP3-RPT-HD-00979, Erosion/Corrosion Analysis Heater Drain System Utilizing CHECMATE

7.2.10 NYPA Report, IP3-RPT-HD-01144, Erosion/Corrosion Analysis of Reheater Drain System Utilizing CHECMATE

7.2.11 NYPA Report, IP3-RPT-FW-00984, Erosion/Corrosion Analysis of Feedwater Recirculation Systems Utilizing CHECMATE

7.2.12 NYPA Report, IP3-RPT-HD-00911, Erosion/Corrosion Analysis of Extraction Steam System Utilizing CHECMATE

7.2.13 EPRI Report NSAC/202L, Recommendations for an Effective Flow-Accelerated Corrosion Program

7.2.14 EPRI PWR Steam Generator Examination Guidelines, TR-106589 - V1

7.2.15 Regulatory Guide 1.26, Quality Group Classifications and Standards Water-, Steam-, and Radioactive-Waste-Controlling Components of Nuclear Power Plants

7.2.16 IP3 FSAR, Sections 17.2.4, 17.2.5, 17.2.6, 17.2.7, 17.2.9, 17.2.10, 17.2.12, 17.2.15, 17.2.16, 17.2.17

7.3 Interface Documents

7.3.1 AP-9, Work Control

7.3.2 AP-12 Modifications

7.3.3 AP-25.1, Request for Engineering Services

7.3.4 AP-39, ASME Section XI, Repair & Replacement Program

7.3.5 AP-55, Preventative Maintenance Program

7.3.6 DCM-2, Preparation and Control of Calculations and Analyses

7.3.7 ESM CES-7, Procedure for Structural Evaluation of Erosion/Corrosion Thinning in Carbon Steel Piping

7.3.8 Piping Specification 9321-05-248-18, Fabrication of Piping Systems

7.3.9 Quality Assurance NDE Procedure Manual

7.3.10 Nuclear Engineering Administrative Procedure 26, Administrative Controls for Containment, Weld and Support Inspection and Erosion/Corrosion Programs at IP3 and JAF Nuclear Power Plants

7.3.11 AP-66, Process Applicability Screening R

8.0 RECORDS and DOCUMENTATION

8.1 Records

The following required records resulting from this procedure are controlled and maintained in accordance with the IP-3 Records Retention Schedule:

8.1.1 ISI Outage Report

8.2 Documentation

The following documentation resulting from this procedure is NOT required to be controlled and maintained in accordance with the IP3 Records Retention Schedule:

None

Attachment 1

ADMINISTRATIVE CONTROLS

for Programs within the Scope of

ASME SECTION XI

CATEGORY	ADMINISTRATIVE CONTROL	RESPONSIBLE GROUP
Repair & Replacement	AP-39	IP3 Maintenance
Pump & Valve Testing	AP-19	IP3 Performance
Snubber Testing	AP-19	IP3 Performance
Piping Weld & Support Inspection	AP-49	Engineering Programs -WPO
Inservice Pressure Testing	AP-19	IP3 Performance
Steam Generator Tubing Inspection	AP-67	Engineering Programs-WPO

Attachment 2

ISI FLOW DIAGRAMS

DRAWING NUMBER	TITLE
ISI-20173	Flow Diagram Main Steam
ISI-20183	Flow Diagram Condensate & Boiler Feed Pump Suction
ISI-20193	Flow Diagram Boiler Feedwater
ISI-20253	Flow Diagram Condenser Air Removal & Water Box Priming
ISI-20333	Flow Diagram Service Water System
ISI-20353	Flow Diagram Station Air
ISI-20363	Flow Diagram Instrument Air
ISI-20413	Flow Diagram Main Steam Traps Sheet No. 1
ISI-26533	Flow Diag. Cont. Hydrogen Concentration Measmt. Post Accident Cont. Venting System
ISI-27193, SH. 1	Flow Diagram Waste Disposal System Sheet No. 1-Containment
ISI-27193, SH. 2	Flow Diagram Waste Disposal System Sheet No. 2-PAB
ISI-27203	Flow Diagram Auxiliary Coolant System Inside Containment Sheet No. 1
ISI-27223	Flow Diagram Service Water System Nuclear Steam Supply Plant
ISI-27233	Flow Diagram Nitrogen to Nuclear Equipment
ISI-27243	Flow Diagram Primary Make-up Water System Nuclear Steam Supply Plant
ISI-27263	Flow Diag. Penetration & Liner Weld Joint Channel Pressurization Sys.
ISI-27293, SH. 1	Flow Diagram Steam Generator Blowdown System
ISI-27293, SH. 2	Flow Diagram Steam Generator Blowdown System Sample Panel
ISI-27353	Flow Diagram Safety Injection System Sheet No. 1
ISI-27363	Flow Diagram Chemical & Volume Control System Sheet No. 1
ISI-27383	Flow Diagram Reactor Coolant System Sheet No. 1
ISI-27453	Flow Diagram Sampling System
ISI-27463	Flow Diagram Isolation Valve Seal Water System
ISI-27473	Flow Diagram Reactor Coolant System Sheet No. 2
ISI-27503	Flow Diagram Safety Injection System Sheet No. 2
ISI-27513, SH. 1	Flow Diagram Auxiliary Coolant System in PAB & FSB Sheet No. 1
ISI-27513, SH. 2	Flow Diagram Auxiliary Coolant System in PAB & FSB Sheet No. 2
ISI-40223	Flow Dia. Vent. Sys. for Containment. Primary Aux. & Fuel Storage Bldgs.
ISI-70453	Radiation Monitoring Installation Details Instrumentation

Attachment 3

INDIAN POINT 3 NUCLEAR POWER PLANT
EROSION/CORROSION PROGRAM

IP3 PIPING SYSTEMS

1. Steam Generator Blowdown
2. Main Steam
3. Auxiliary Steam
4. Extraction Steam
5. Main Feedwater
6. Auxiliary Feedwater
7. Feedwater Heater Drain
8. Reheater Drain
9. Moisture Separator Drain
10. Condensate

NOTE:
The selection of the above systems was based on the following: a) carbon steel material, b) temperature greater than 190°F, and c) system carrying water or steam. Other systems not meeting these criteria such as Service Water, Component Cooling Water, and Miscellaneous Drains Secondary Plant will be evaluated on a case-by-case basis and routinely inspected.

New York Power Authority

ENGINEERING STANDARDS MANUAL

TITLE: PROCEDURE FOR STRUCTURAL EVALUATION OF EROSION-CORROSION THINNING IN CARBON STEEL PIPING	**ESM :** CES-7 **DATE:** 10/1/93 **REVISION:** 2
APPROVAL: Paul Bonr 10/1/93 Paul Bonr Vice President, Nuclear Engineering	
WRITTEN/REVISED BY: H.Y.Chang: H.Y. Chang 9/30/93	**REVIEWED BY:** J.V. Brunetti: J.V. Brunetti 10/1/93
DESIGN VERIFIED BY: Mara Lakis 9/30/93 Mara Lakis	Konstantinos Mavrikis 10/1/93 Konstantinos Mavrikis Director - NED
EFFECTIVE DATE: 10/1/93	

TITLE: PROCEDURE FOR STRUCTURAL EVALUATION OF EROSION-CORROSION THINNING IN CARBON STEEL PIPING

LIST OF EFFECTIVE PAGES

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this standard is to provide a guide to evaluate pipe wall thinning as a result of erosion-corrosion in carbon steel piping at the IP3 and JAF power stations.

2.0 APPLICABILITY

This standard provides an acceptable method of performing pipe wall thinning evaluations for both IP3 and JAF power stations.

3.0 GENERAL

3.1 The acceptance criteria of this standard are based on:

a. Piping primary stress requirements of USAS B31.1 Code (Reference 5.1) (1)

b. Seismic piping stress requirements of the JAF and IP3 piping (Reference 5.2 and 5.3)

c. Acceptance standards of ASME Code Case N-480 (Reference 5.4)

3.2 The minimum measured pipe wall thickness (t_{mm}) should be determined by a non-destructive examination (NDE). The pipe wall erosion-corrosion rate should be estimated, so that the minimum predicted wall thickness (t_p) can be projected at the next in-service inspection for thinning evaluations.

3.3 The method of the pipe wall thinning evaluation in this standard is a procedure of three steps to assess the acceptability of the minimum predicted thickness (t_p). The sequence of the steps are in the order of severity of the pipe wall thinning.

Note: (1) Based on ASME Code Case N-480 and EPRI Report (Reference 5.6), piping thermal stresses are not required to be evaluated for pipe wall thinning.

The three steps are:

Step 1 - Screening Evaluation
Step 2 - Minimum wall thickness Evaluation
Step 3 - Local Thinning Evaluation

3.4 This standard also provides an approach to estimate the remaining service life of a thinning pipe, so that the next inspection of the thinning area can be more timely scheduled.

4.0 PROCEDURE (1) (2)

4.1 Estimation of Minimum Predicted Wall Thickness - t_p

a. Obtain t_{nom} : pipe nominal thickness
t_{mea} : the latest measured minimum pipe wall thickness
t'_{mea} : the previous measured thickness at the same location (3)

b. Determine the time between latest and previous measurements; TIME (in years)

d. Estimate erosion-corrosion rate C:

$$C = \frac{t'_{mea} - t_{mea}}{TIME}$$

e. Calculate:

$$t_p = t_{mea} - C * Y \quad (4)$$

Where Y = time between the latest and next scheduled inspections (years)

Notes: (1) Evaluation Forms for this procedure areprovided at the end of this standard.

(2) Summary of evaluation criteria for this procedure is listed in Table 6.1

(3) If t'_{mea} is not available, let $t'_{mea} = 1.125 * t_{nom}$ and TIME = pipe service years up to the latest measurement.

(4) "*" is the multiplication sign herein.

4.2 Step 1 - Screening Evaluation

Determine the acceptability of t_p by the screening criteria :

Screening Criteria (1)	Acceptability
$t_p \geq 0.875 * t_{nom}$	Accept as is
$0.875 * t_{nom} > t_p \geq 0.3 * t_{nom}$	Step 2 evaluation required
$0.3 * t_{nom} > t_p$	Repair or replacement

Note: (1) The screening criteria are based on acceptance standard of Reference 5.4.
(2) $0.875 t_{nom}$ is based on the acceptable tolerance 12.5% of t_{nom} for ANS piping products.

4.3 Step 2 - Minimum Wall Thickness Evaluation

a. Obtain:

P = Design pressure
T = Design temperature
D = Pipe outside diameter
S = Allowable stress at design temperature
(See Table 6.2 for some typical carbon steel piping materials)

4.3 (Cont.)

b. Determine :

E = Longitudinal weld effective Coefficient (See Table 6.2)
y = 0.4 for ferritic or austenistic steels operated under 900 °F
A = An additional thickness for erosion and/or corrosion

c. Calculate minimum required wall thickness (t^b_{min}) for hoop stress due to internal pressure

$$t^b_{min} = \frac{P*D}{2(S*E + P*y)} + A \qquad (1)$$

d. Obtain axial stresses at the thinning area due to pressure and mechanical loads for Design, Normal/Upset and Emergency/Faulted Operating Conditions;

- S_{Des} = Axial stress of Design Conditions, i.e., due to design pressure (P) and dead weight (DW) or other sustained loads.

- S_{Ops} = Axial stress of Normal/Upset Conditions, i.e., due to loadings of Design Conditions and Operating Basis Earthquake (OBE).

- S_{Fau} = Axial stress of Emergency/Faulted Conditions, i.e., due to loadings of Design Conditions and Design Basis Earthquake (DBE).

Note: (1) This formula is from Paragraph 104.1 of Reference 8.1 for straight pipes or elbows. For tees and branch connections, the run pipe is weaken by the branch opening. A reinforcement is required around the opening to sustain the internal pressure loading. The requirements wall thickness at the reinforcement area are specified in Section 104.3.1 of B31.1 Code (Reference 8.1). The evaluation of wall thinning at the reinforcement area are provided in Evaluation Forms of this standard.

4.3 (Cont.)

e. Calculate minimum wall thicknesses for all primary axial stresses (S_{Dmm}, S_{Ops} and S_{Pmm}), respectively;

$$t_1 = \frac{S_{Dmm}}{S} + t_{nom} \qquad (1), (2), (3)$$

$$t_2 = \frac{S_{Ops}}{1.2*S} + t_{nom}$$

$$t_3 = \frac{S_{Pmm}}{1.8*S} + t_{nom}$$

f. Determine the minimum thickness for axial stresses, t^a_{min}

t^a_{min} = The maximum of (t_1 , t_2 , t_3)

Notes: (1) For safety related piping system, S_{Dmm}, S_{Ops} and S_{Pmm} can be obtained from the latest piping stress report.

(2) For non-safety related piping system, only S_{Dmm} needs to be considered.

$$S_{Dmm} = \frac{P*D}{4t_{nom}} + 0.75i\,\frac{M_A}{Z}$$

where M_A = Bending moment due to dead weight
Z = Pipe section modulus
i = Stress intensification factor (See Table 6.3 for values of 0.75i)

Based on the maximum pipe support spacing suggested by the B31.1 Code, the (M_A/Z) can be estimated to be 1,500 psi.

(3) Piping section modulus (Z) can be expressed as $\pi R_m^2 t_{nom}$ (R_m :pipe mean radius) For the same pressure and mechanical bending loadings and no change of pipe size, the piping axial stresses can be approximated to be proportional to ($1/t_{nom}$). The above equations are based on the proportional relationship.

4.3 (Cont.)

g. Determine the acceptability of t_p by minimum wall thickness requirements:

Minimum Thickness Criteria (1)	Acceptability
$t_p \geq t^b_{min}$ & t^a_{min}	Accept but monitor
$t^b_{min} > t_p \geq t^a_{min}$	Step 3 evaluation req'd
$t_p < t^a_{min}$	Repair or replacement

Note: (1) The criteria are based on piping design requirements (Reference 5.1 and 5.2)

4.4 Step 3 - Local Thinning Evaluation

a. Obtain the local thinning dimensions;

L, L_m, $L_{m(c)}$ and $L_{m(t)}$ (See Figure 7.2 for illustration)

b. Let $t_{min} = t^b_{min}$ (1)

c. Calculate $\sqrt{R*t_{min}}$, where R = Pipe outside radius

d. Determine acceptable local thicknesses (t_{alco}) as follows;

Case	Applicable Limits	t_{alco}/t_{min} (2)
1	$L_{m(t)} \leq \sqrt{R*t_{min}}$	From curve 1 of Figure 7.3
2	$L_m \leq 2.65\sqrt{R*t_{min}}$ and $1.13*t_{min} \leq t_{nom}$	Greater of $\frac{1.5\sqrt{R*t_{min}}}{L}*\left(1 - \frac{t_{nom}}{t_{min}}\right) + 1$ and $0.353\ \frac{L_m}{\sqrt{R*t_{min}}}$
3	None	From curve 2 of Figure 7.3

Notes : (1) The acceptance of local thinning is for hoop stress due to internal pressure only.

(2) The acceptable t_{alco}/t_{min} is based on Section 3622 of Reference 8.4.

4.4 (Cont.)

e. Determine the minimum acceptable local thickness;

t_{alee} = The smallest t_{alee} of case 1, 2 and 3

f. Determine acceptability of t_y as follows:

Local Thinning Criteria	Acceptability
$t_y \geq t_{alee}$	Accept but monitor
$t_y < t_{alee}$	Repair or replacement

4.5 Estimation of Pipe Remaining Service Life

a. Determine the governing minimum required thickness

t_y = larger of (t^b_{min}, t^a_{min}) if $t_y \geq t^b_{min}$ & t^a_{min}

= t_{alee} of Case 3 if $t^b_{min} > t_y \geq t^a_{min}$

t_y shall be equal to or greater than $0.3t_{nom}$.

b. Estimate Remaining Service Life (RSL)

$$RSL = \frac{t_{meas} - t_y}{C}$$

Where C = Pipe wall erosion-corrosion rate

5.0 REFERENCES

5.1 USAS B31.1 - 1967, "POWER PIPING".

5.2 IP3 FSAR TABLE 16.1-2

5.3 JAF FSAR Section 12.5.4

5.4 ASME Pressure Vessel & Piping Code Case N-480, Section - 3000, Acceptance Standard.

5.5 EPRI Report NP-5911SP, "Acceptance Criteria for Structural Evaluation of Erosion-Corrosion Thinning in Carbon Steel Piping", Final Report, July 1988.

6.0 TABLES

Table 6.1 - Summary of Evaluation Criteria for Piping Wall Thinning

Table 6.2 - Allowable Stresses for Some Typical Carbon steels

Table 6.3 - Values of 0.75i for Standard Pipe Sections

7.0 FIGURES

Figure 7.1 - Logic Diagram for Piping Wall Thinning Evaluation

Figure 7.2 - Illustration of Erosion-Corrosion Wall Thinning

Figure 7.3 - Allowable Depth and Length of Locally Thinned Area

Figure 7.4 - Reinforcement of Branch Connections or Tees

Figure 7.5 - Reinforced Extruded Outlet

TABLE 6.1

Summary of Evaluation Criteria for Pipe Wall Thinning

Step No.	Criteria	Acceptability
1. Screening Evaluation	$t_p \geq 0.875 * t_{nom}$	Accept as is
	$0.875 * t_{nom} > t_p \geq 0.3 * t_{nom}$	Step 2 Evaluation Require
	$t_p < 0.3 * t_{nom}$	Repair or Replacement
2. Minimum Wall Thickness Evaluation	$t_p \geq t^h_{min}$ and t^a_{min}	Accept but Monitor
	$t^h_{min} > t_p \geq t^a_{min}$	Step 3 Evaluation Required
	$t^a_{min} > t_p$	Repair or Replacement
3. Local Thinning Evaluation	$t_p \geq t_{aloc}$	Accept but Monitor
	$t_p < t_{aloc}$	Repair or Replacement

Note: Definitions of Pipe Wall Thicknesses

- t_{nom} = Nominal thickness
- t_p = Minimum predicted thickness (projected to the next inspection)
- t^h_{min} = Minimum thickness determined by hoop stress due to internal pressure
- t^a_{min} = Minimum thickness determined by axial stresses due to pressure, dead weight and seismic loads
- t_{aloc} = Acceptable local thickness

TABLE 6.2

Allowable Stress Values for Some Typical Carbon Steels and Low Alloy Steels

Material [1]	Grade	E Longitudinal Joint Efficient Factor	S Allowable Stress at 650° F (PSI)
A53 Seamless	A	1.0	12000
	B	1.0	15000
A106 Seamless	A	1.0	12000
	B	1.0	15000
	C	1.0	17500
A155 Class I	C55	1.0	13750
Class II		0.9	12400
A335 Seamless	P11	1.0	15000
	P22	1.0	15000
A234	WPB	1.0	15000
	WP11	1.0	15000
	WP22	1.0	15000

Note : (1) The values of this table are from ANSI B31.1 -1967 or later.

TABLE 6.3

VALUES OF 0.75i FOR STANDARD PIPE SECTIONS

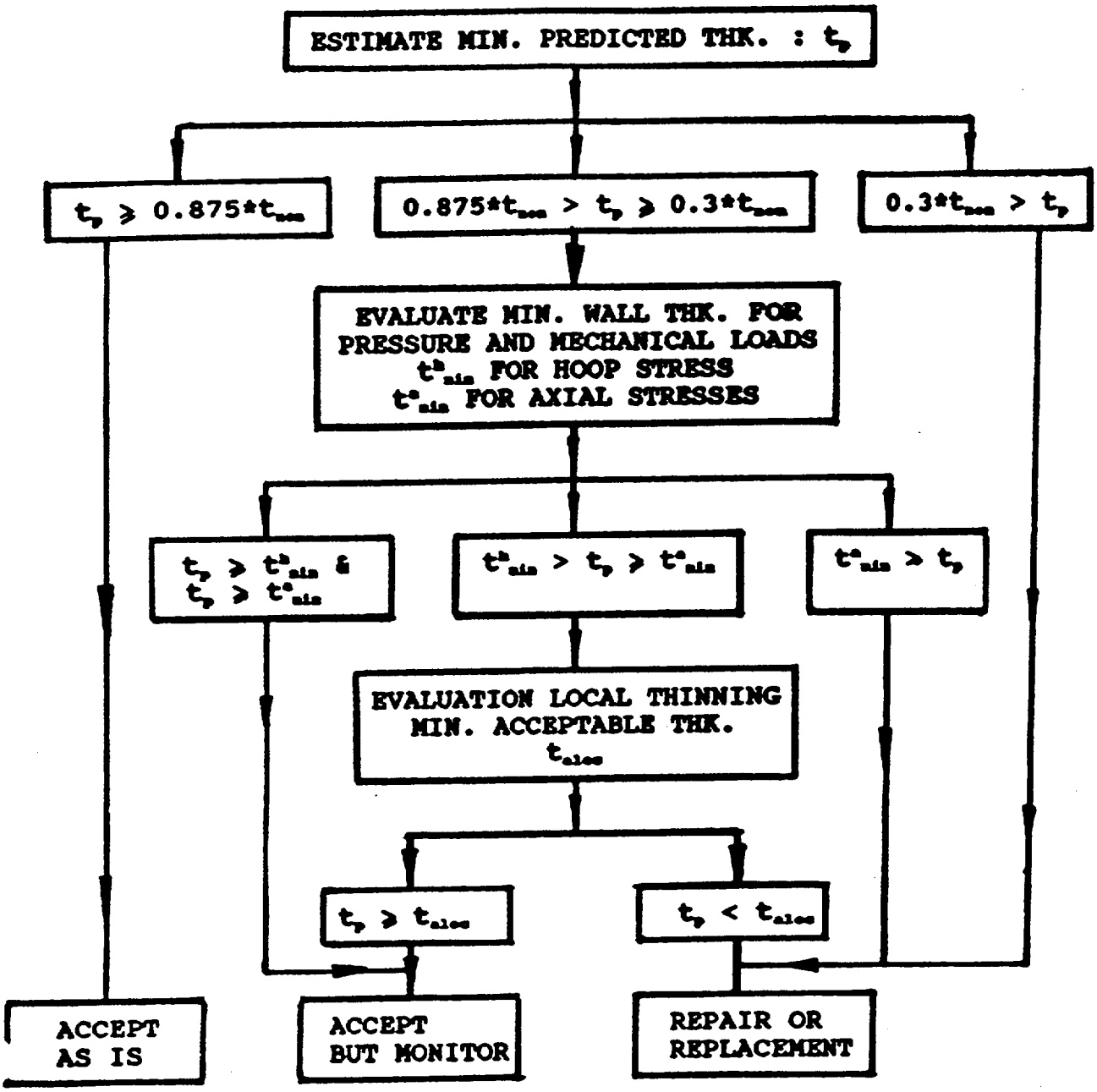
PIPE NOM. DIA. (IN.)	STRAIGHT PIPE OR REDUCER	STD. ELBOW	SHORT RADIUS ELBOW	5 DIA. ELBOW	WELDING TEE (B16.9)	Unreinforced TEE OR BRANCH CONNECTION
4	1.0	1.46	1.92	1.0	1.09	2.92
6	1.0	1.70	2.23	1.0	1.27	3.41
8	1.0	1.83	2.40	1.0	1.38	3.71
10	1.0	1.95	2.56	1.0	1.48	3.97
12	1.0	2.15	2.82	1.00	1.63	4.38
14	1.0	2.20	2.89	1.00	1.74	4.67
16	1.0	2.42	3.17	1.08	1.90	5.12
18	1.0	2.63	3.44	1.18	2.06	5.54
20	1.0	2.82	3.70	1.27	2.22	5.96
22	1.0	3.02	3.96	1.35	2.37	6.35
24	1.0	3.21	4.20	1.44	2.51	6.74
26	1.0	3.39	4.44	1.52	2.65	7.12
28	1.0	3.56	4.67	1.60	2.78	7.48
30	1.0	3.74	4.90	1.67	2.92	7.84

Notes:

(1) The generic formulas of the stress intensification factor i are in Appendix D of B31.1 -1967.
(2) For other schedule pipe sections, the i shall be calculated from the generic formulas.

FIGURE 7.1

LOGIC DIAGRAM FOR
PIPE WALL THINNING EVALUATIONS



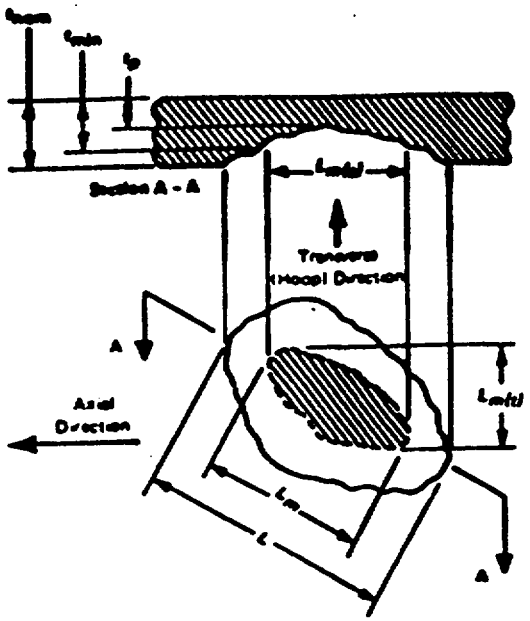


Figure 7.2 ILLUSTRATION OF EROSION-CORROSION WALL THINNING

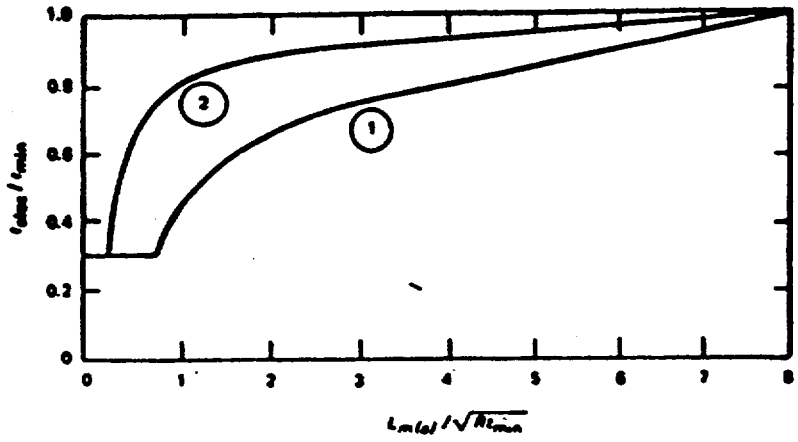


Figure 7.3 ALLOWABLE DEPTH AND LENGTH OF LOCALLY THINNED AREA

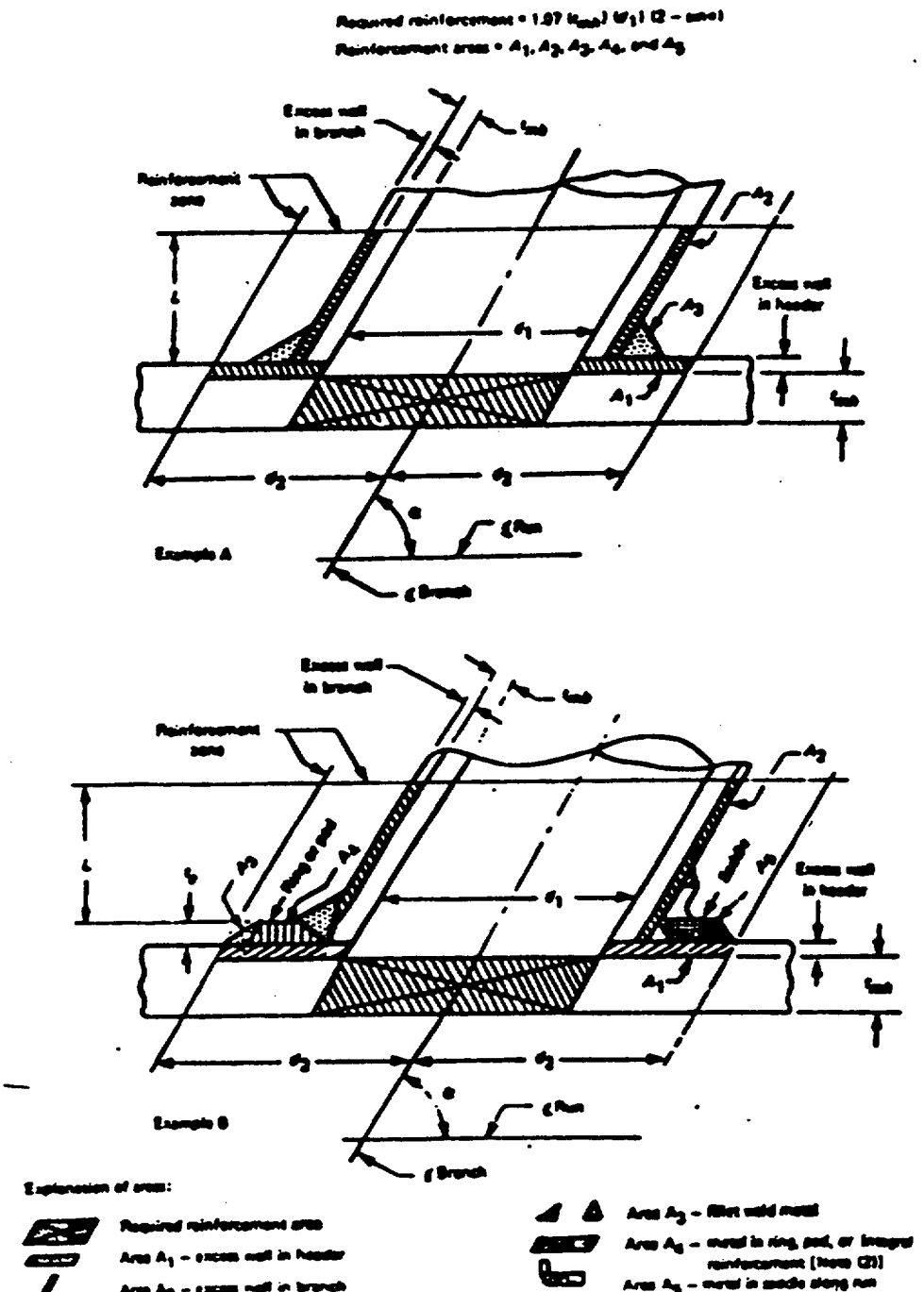


Figure 7.4 REINFORCEMENT OF BRANCH CONNECTIONS

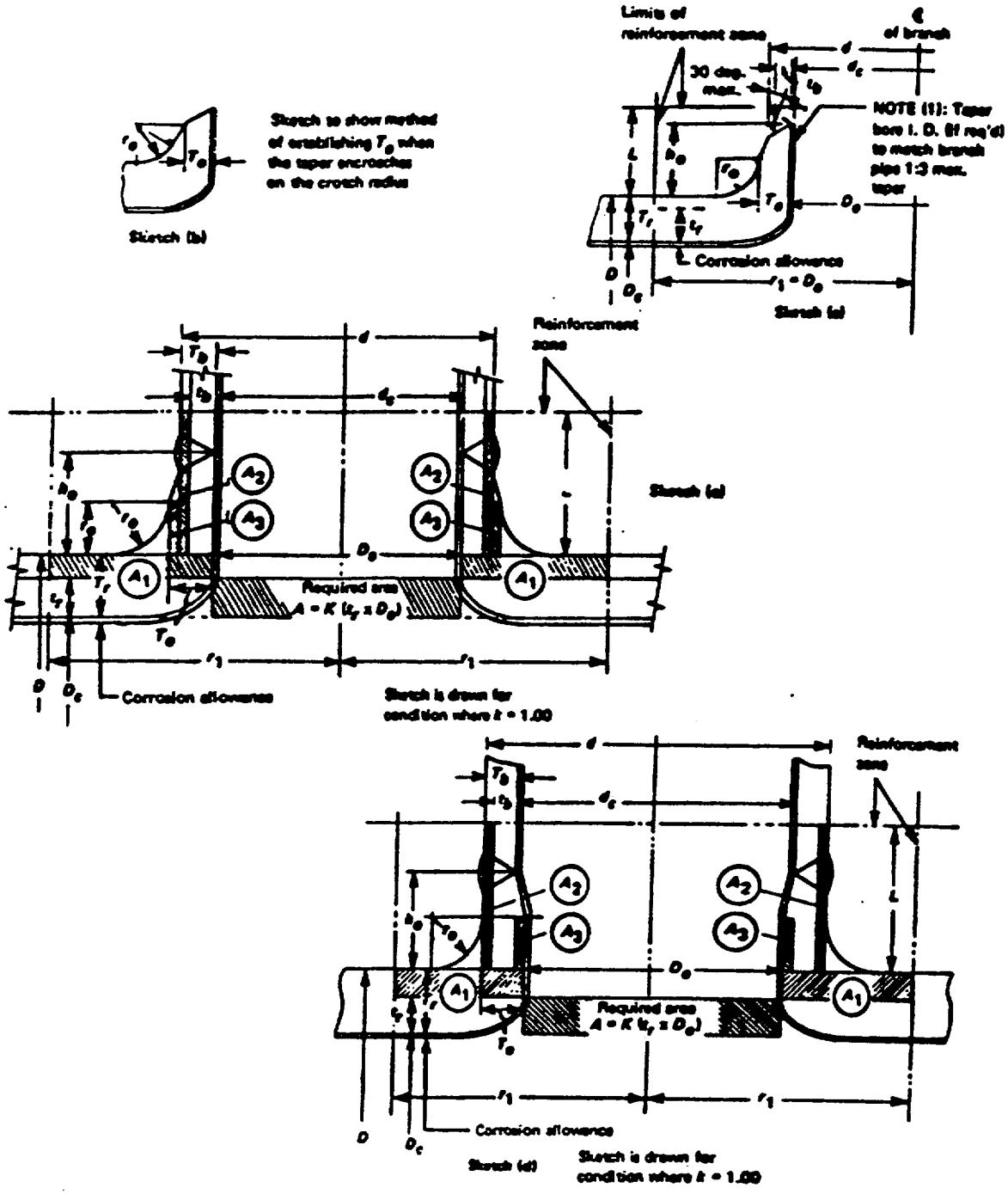


Figure 7.5 REINFORCED EXTRUDED OUTLETS

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EVALUATION OF PIPE WALL THINNING
Piping System : _____
Description : _____
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

STEP 1 : SCREENING EVALUATION

a. Evaluation of Minimum Predicted Thickness : t_p

- Pipe Wall Nominal Thickness, t_{nom} = _____ in.
- Latest Measured Minimum Wall Thickness, t_{mm} = _____ in.
- Previous Measured Minimun Wall Thickness, t'_{mm} = _____ in.
  (If wall has not measured before, $t'_{mm}=1.125*t_{nom}$)
- TIME Between Two Inspections, = _____ yr.
  (If wall has not measured before,
  TIME = service years of the pipe up to first inspection.)
- Erosion/Corrosion Rate, C

$$C = \frac{t'_{mm} - t_{mm}}{TIME}$$ = _____ in/yr

- Years between Latest and Next Inspections, Y = _____ yrs.
- $t_p = t_{mm} - C * Y$ = _____ in.

b. Screening Limits :

- Acceptable Limit = $0.875 * t_{nom}$ = _____ in.
- Unacceptable Limit = $0.3 * t_{nom}$ = _____ in.

c. Acceptability of the Thinning Wall:

- [ ] Accept As Is for $t_p \geq 0.875*t_{nom}$
- [ ] Step 2 Evaluation Required for $0.875*t_{nom} > t_p \geq 0.3*t_{nom}$
- [ ] Repair or Replacement for $0.3*t_{nom} > t_p$

Note: This Evaluation Form can be used as a part of calculation for pipe thinning evaluation, but the calculation shall follow the requirements of NYPA ECM.

EVALUATION OF PIPE WALL THINNING

Piping System : _____

Description : _____

Prepared By : _____ Date : _____

Checked By : _____ Date : _____

STEP 2 : MINIMUM WALL THICKNESS EVALUATION

a. Pipe Parameters:

- Pipe Outside Diameter, D = _____ in.
- Design Pressure, P = _____ psi
- Design Temperature, T_d = _____ °F
- Pipe Material = _____
- Allowable Stress at Design Temperature, S = _____ psi
- Longitudinal Weld Effective Coefficient, E = _____
- An Additional Thickness for Erosion/Corrosion, A = _____ in.

b. Pipe Minimum Wall Thickness Required by Hoop Stress :

- $t^b_{min} = \frac{P*D}{2(S*E+0.4P)} + A$ = _____ in.

c. Pipe Minimum Wall Thickness Required by Axial Stresses :

- Axial Stress due to Design Cond.(P+DW), S_{Pmm} = _____ psi
- Axial Stress due to Upset Cond.(P+DW+OBE), S_{Ope} = _____ psi
- Axial Stress due to Faulted Cond.(P+DW+DBE), S_{Fmm} = _____ psi
- $t_1 = (S_{Pmm}/S)*t_{nom}$ = _____ in.
- $t_2 = (S_{Ope}/1.2S)*t_{nom}$ = _____ in.
- $t_3 = (S_{Fmm}/1.8S)*t_{nom}$ = _____ in.

- t^a_{min} = Largest of (t_1, t_2, t_3) = _____ in.

d. Acceptability based on Minimum Wall Thickness Criteria :

- [ ] Accept But Monitor for $t_p \geq t^b_{min}$ & t^a_{min}
- [ ] Step 3 Evaluation Required for $t^b_{min} > t_p \geq t^a_{min}$
- [ ] Repair or Replacement for $t^a_{min} > t_p$

EVALUATION OF PIPE WALL THINNING

Piping System : _____

Description : _____

Prepared By : _____ Date : _____

Checked By : _____ Date : _____

STEP 3 : LOCAL THINNING EVALUATION & ESTIMATEION OF REMAINING SERVICE LIFE

a. Pipe Parameters:

$R = D/2 =$ _____ in., $t_{min} = t^{a}_{min} =$ _____ in., $\sqrt{R*t_{min}} =$ _____ in.

b. Local Thinning Dimensions : (see Figure 7.2)

$L =$ _____ in., $L_a =$ _____ in., $L_{a(c)} =$ _____ in., $L_{a(a)} =$ _____ in.

$L_{a(a)} / \sqrt{R*t_{min}} =$ _____

c. Acceptable Local Thinning thicknesses:

- Case 1 : Applicable if $L_{a(c)} \leq \sqrt{R*t_{min}}$

  t_{aloc}/t_{min} (from curve 1 in Figure 7.3) = _____

  $t_1 = (t_{aloc}/t_{min})*t_{min}$ = _____ in.

- Case 2 : Applicable if $L_a \leq 2.65\sqrt{R*t_{min}}$ & $1.13t_{min} \leq t_{nom}$,

  $t_{21} = \left[\frac{1.5\sqrt{R*t_{min}}}{L}\left(1 - \frac{t_{nom}}{t_{min}}\right) + 1.\right]*t_{min}$ = _____ in.

  $t_{22} = (0.353\ L_a / \sqrt{R*t_{min}})*t_{min}$ = _____ in.

  t_2 = Larger of (t_{21}, t_{22}) = _____ in.

- Case 3 :

  t_{aloc}/t_{min} (from Curve 2 in Figure 7.3) = _____

  $t_3 = (t_{aloc}/t_{min})*t_{min}$ = _____ in.

- Minimum Acceptable Local Thickness

  t_{aloc} = Minimum of (t_1, t_2, t_3) = _____ in.

d. Acceptability based on Local Thinning Critwia :

- [ ] Accept But Monitor for $t_p \geq t_{aloc}$
- [ ] Repair or Replacement for $t_p < t_{aloc}$

e. Pipe Wall Remaining Service Life (RSL):

- t_q = Larger of $(t^{a}_{min}, t^{c}_{min})$ if $t_p \geq t^{a}_{min}$ & t^{c}_{min}
  $= t_p$ if $t^{a}_{min} > t_p \geq t^{c}_{min}$ = _____ in.
  $\geq 0.3*t_{nom}$

- $RSL = \frac{t_{nom} - t_q}{C}$ (where C= pipe thinning rate) = _____ yrs.

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EVALUATION OF PIPE WALL THINNING

Piping System : _____

Description : _____

Prepared By : _____ Date : _____

Checked By : _____ Date : _____

Minimun Wall Thickness for Unreinforced Branch Connection or Tee (see Figure 7.4 for detail dimensions)

1. Tee Dimensions:

a : angle between axes of run and branch	= _____	deg.
d_i : ID of branch	= _____	in.
d_o : OD of branch	= _____	in.
t_p : min. predicted branch wall thickness	= _____	in.
t_{min} : min. required branch wall thk. for pressure	= _____	in.
D_o : OD of run pipe	= _____	in.
T_p : min. predicted run wall thickness	= _____	in.
T_{min} : min. required run wall thickness for pressure	= _____	in.

2. Reinforcement Dimensions:

$d_1 = d_i/\sin(a)$	= _____	in.
d_2 = greater of d_i or $(t_p+T_p+d_i/2)$ but not more D_o	= _____	in.
$L = 2.5*t_{nom}$ (t_{nom} : branch nom. thk.)	= _____	in.

3. Reinforced Area Required for pressure:

$A_{req} = 1.07\ T_{min}*d_1*(2-\sin(a))$ = _____ in^2

4. Reinforcement Areas Provided:

$A_1 = d_2*(T_p-T_{min})$; excess wall thk. in run	= _____	in^2
$A_2 = 2L*(t_p-t_{min})$; excess wall thk. in branch	= _____	in^2
A_3 = area of filled welds	= _____	in^2
A_4 = (OD of pad - d_i)*t_e; (t_e pad or saddle thk.)	= _____	in^2
A_5 = (OD of saddle - d_i)*t_e; metal in saddle	= _____	in^2
Total Area Provided : $A_{prov} = A_1+A_2+A_3+A_4+A_5$	= _____	in^2

5. Acceptability of Thinning at Tee Reinforcement Area:

[ ] Acceptable if $A_{req} \le A_{prov}$

[ ] Not Acceptable if $A_{req} > A_{prov}$

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EVALUATION OF PIPE WALL THINNING

Piping System : _____
Description : _____
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

Minimum Wall Thickness Evaluation for Reinforced Extruded Outlets (see Figure 7.5 for detail dimensions)

1. Extruded Outlet Dimensions:

d : OD of branch	=	_____ in.
$T_b = t_p$, min. predicted br. wall thickness	=	_____ in.
$t_b = t_{min}$, min. required br. wall thk. for pressure	=	_____ in.
D : OD of run pipe	=	_____ in.
$T_r = T_p$, min. predicted run wall thickness	=	_____ in.
$t_r = T_{min}$, min. required run wall thk. for pressure	=	_____ in.
D_o : internal diameter measured at the level of outside surface of the run	=	_____ in.

2. Reinforcement Area Required for Internal Pressure:

$A_{req} = K * (t_r * D_o)$ = _____ in.

Where $K = 1.0$ if $d/D \geq 0.60$
$= 0.6+2d/3D$ if $0.60 > d/D > 0.15$
$= 0.7$ if $0.15 \geq d/D$

3. Reinforcement Area Provided:

$A_1 = D_o*(T_r-t_r)$; excess wall in run	=	_____ in².
$A_2 = 2L*(T_b-t_b)$; excess wall in branch Where $L = 0.7d*T_b$	=	_____ in².
$A_3 = 2r_o*(T_b-T_b)$; excesssss in extruded outlet lip Where r_o and T_o are dimensions of the extruded outlet lip (see figure 5)	=	_____ in².
Total Reinforcement Area Provided : $A_{prov} = A_1+A_2+A_3$	=	_____ in².

4. Acceptability of Thinning at Reinforcement Area:

[ ] Acceptable if $A_{req} \leq A_{prov}$
[ ] Not Acceptable if $A_{req} > A_{prov}$

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JAF NUCLEAR POWER PLANT

CALCULATION NO. EXAMPLE #1 REVISION ___ PAGE 1 of 3

EVALUATION OF PIPE WALL THINNING

Piping System : FEEDWATER

Description : PIPE THINNING AT 12" ELB, SCH. 100

Prepared By : _____ Date : _____

Checked By : _____ Date : _____

STEP 1 : SCREENING EVALUATION

a. Evaluation of Minimum Predicted Thickness : t_p

- Pipe Wall Nominal Thickness, t_{nom} = 0.844 in.
- Latest Measured Minimum Wall Thickness, t_{mm} = 0.720 in.
- Previous Measured Minimun Wall Thickness, t'_{mm} = 0.950 in.
  (If wall has not measured before, $t'_{mm} = 1.125 * t_{nom}$) ✓
- TIME Between Two Inspections, = 15 yr.
  (If wall has not measured before,
  TIME = service years of the pipe up to first inspection.)
- Erosion/Corrosion Rate, C

$$C = \frac{t'_{mm} - t_{mm}}{TIME}$$ = 0.0153 in/yr

- Years between Latest and Next Inspections, Y = 2 yrs.
- $t_p = t_{mm} - C * Y$ = 0.689 in.

b. Screening Limits :

- Acceptable Limit = $0.875 * t_{nom}$ = 0.738 in.
- Unacceptable Limit = $0.3 * t_{nom}$ = 0.253 in.

c. Acceptability of the Thinning Wall:

- [ ] Accept As Is for $t_p \geq 0.875 * t_{nom}$
- [✓] Step 2 Evaluation Required for $0.875 * t_{nom} > t_p \geq 0.3 * t_{nom}$
- [ ] Repair or Replacement for $0.3 * t_{nom} > t_p$

Note: This Evaluation Form can be used as a part of calculation for pipe thinning evaluation, but the calculation shall follow the requirements of EPRI NSAC.

EVALUATION OF PIPE WALL THINNING
Piping System : FEEDWATER
Description : 12" SCH 100
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

STEP 2 : MINIMUM WALL THICKNESS EVALUATION

a. Pipe Parameters:

- Pipe Outside Diameter, D = 12.25 in.
- Design Pressure, P = 1250 psi
- Design Temperature, T_e = 575 °F
- Pipe Material = SA 106 GR B
- Allowable Stress at Design Temperature, S = 15000 psi
- Longitudinal Weld Effective Coefficient, E = 1.0
- An Additional Thickness for Erosion/Corrosion, A = 0 in.

b. Pipe Minimum Wall Thickness Required by Hoop Stress :

- $t^b_{min} = \frac{P*D}{2(S*E+0.4P)} + A$ = 0.749 in.

c. Pipe Minimum Wall Thickness Required by Axial Stresses :

- Axial Stress due to Design Cond.(P+DW), S_{Dee} = 7090 psi
- Axial Stress due to Upset Cond.(P+DW+OBE), S_{Ope} = 13318 psi
- Axial Stress due to Faulted Cond.(P+DW+DBE), S_{Fee} = 17235 psi
- $t_1 = (S_{Dee}/S)*t_{nom}$ = 0.398 in.
- $t_2 = (S_{Ope}/1.2S)*t_{nom}$ = 0.684 in.
- $t_3 = (S_{Fee}/1.8S)*t_{nom}$ = 0.659 in.

- t^a_{min} = Largest of (t_1, t_2, t_3) = 0.684 in.

d. Acceptability based on Minimum Wall Thickness Criteria :

- [ ] Accept But Monitor for $t_p \geq t^b_{min}$ & t^a_{min}
- [✓] Step 3 Evaluation Required for $t^b_{min} > t_p \geq t^a_{min}$
- [ ] Repair or Replacement for $t^a_{min} > t_p$

VALUATION OF PIPE WALL THINNING

Piping System : FEEDWATER

Description : 12" PIPE SCH 100

Prepared By : _____ Date : _____

Checked By : _____ Date : _____

STEP 3 : LOCAL THINNING EVALUATION & ESTIMATEION OF REMAINING SERVICE LIFE

a. Pipe Parameters:

$R = D/2 =$ 6.375 in., $t_{min} = t^{b}_{min} =$ 0.749 in., $\sqrt{R*t_{min}} =$ 2.185 in.

b. Local Thinning Dimensions : (see Figure 7.2)

$L =$ 5.0 in., $L_s =$ 4.0 in., $L_{s(c)} =$ 2.0 in., $L_{s(a)} =$ 2.5 in.

$L_{s(a)} / \sqrt{R*t_{min}} =$ 1.144

c. Acceptable Local Thinning thicknesses:

- Case 1 : Applicable if $L_{s(c)} \leq \sqrt{R*t_{min}}$

  t_{alcc}/t_{min} (from curve 1 in Figure 7.3) = 0.5

  $t_1 = (t_{alcc}/t_{min})*t_{min}$ = 0.375 in.

- Case 2 : Applicable if $L_s \leq 2.65\sqrt{R*t_{min}}$ & $1.13t_{min} \leq t_{nom}$,

  $t_{21} = \left[\frac{1.5\sqrt{R*t_{min}}}{L}\left(1 - \frac{t_{nom}}{t_{min}}\right) + 1.\right]*t_{min}$ = _____ in.

  $t_{22} = (0.353\ L_s / \sqrt{R*t_{min}})*t_{min}$ = _____ in.

  t_2 = Larger of (t_{21}, t_{22}) = N.A. in.

- Case 3 :

  t_{alcc}/t_{min} (from Curve 2 in Figure 7.3) = 0.85

  $t_3 = (t_{alcc}/t_{min})*t_{min}$ = 0.637 in.

- Minimum Acceptable Local Thickness

  t_{alcc} = Minimum of (t_1, t_2, t_3) = 0.375 in.

d. Acceptability based on Local Thinning Critwia :

- [✓] Accept But Monitor for $t_p \geq t_{alcc}$
- [ ] Repair or Replacement for $t_p < t_{alcc}$

e. Pipe Wall Remaining Service Life (RSL):

- t_p = Larger of $(t^{b}_{min}, t^{a}_{min})$ if $t_p > t^{b}_{min}$ & t^{a}_{min}
  $= t_p$ if $t^{b}_{min} > t_p \geq t^{a}_{min}$ ✓ = 0.635 in.
  $\geq 0.3*t_{nom}$

- $RSL = \frac{t_{nom} - t_p}{C}$ (where C= pipe thinning rate) = 5.5 yrs.

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JAF NUCLEAR POWER PLANT

CALCULATION NO. EXAMPLE #2 REVISION ___ PAGE 1 of 4

EVALUATION OF PIPE WALL THINNING
Piping System : EXTRACT STEAM, PT. #2
Description : WALL THINNING AT 26"x26" TEE, SCH: STD.
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

STEP 1 : SCREENING EVALUATION

a. Evaluation of Minimum Predicted Thickness : t_p

- Pipe Wall Nominal Thickness, t_{nom} = 0.375 in.
- Latest Measured Minimum Wall Thickness, t_{mm} = 0.37 in.
- Previous Measured Minimun Wall Thickness, t'_{mm} = 0.422 in.
  (If wall has not measured before, $t'_{mm} = 1.125 * t_{nom}$)
- TIME Between Two Inspections, = 12 yr.
  (If wall has not measured before, TIME = service years of the pipe up to first inspection.)
- Erosion/Corrosion Rate, C

$$C = \frac{t'_{mm} - t_{mm}}{TIME}$$ = 0.0127 in/yr

- Years between Latest and Next Inspections, Y = 2 yrs. 7 yrs
- $t_p = t_{mm} - C * Y$ = 0.244 in. 0.12 ?

b. Screening Limits :

- Acceptable Limit = $0.875 * t_{nom}$ = 0.328 in.
- Unacceptable Limit = $0.3 * t_{nom}$ = 0.113 in.

c. Acceptability of the Thinning Wall:

- [ ] Accept As Is for $t_p \geq 0.875 * t_{nom}$
- [✓] Step 2 Evaluation Required for $0.875 * t_{nom} > t_p \geq 0.3 * t_{nom}$
- [ ] Repair or Replacement for $0.3 * t_{nom} > t_p$

Note: This Evaluation Form can be used as a part of calculation for pipe thinning evaluation, but the calculation shall follow the requirements of NYPA ECM.

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CALCULATION NO. Example #2 REVISION ____ PAGE 2 of 4

EVALUATION OF PIPE WALL THINNING

Piping System : Extrat Steam Pt. #2
Description : Wall Thinning at 26"x36" Tee, Sch. Std.
Prepared By : ______________ Date : ______________
Checked By : ______________ Date : ______________

STEP 2 : MINIMUM WALL THICKNESS EVALUATION

a. Pipe Parameters:

- Pipe Outside Diameter, D = 26 / 36 in.
- Design Pressure, P = 50 psi
- Design Temperature, T_d = 250 °F
- Pipe Material = SA106 GR.B
- Allowable Stress at Design Temperature, S = 15000 psi
- Longitudinal Weld Effective Coefficient, E = 1.0
- An Additional Thickness for Erosion/Corrosion, A = 0.032 in. (EST. ≈ 1/32")

b. Pipe Minimum Wall Thickness Required by Hoop Stress :

$$t^{h}_{min} = \frac{P*D}{2(S*E+0.4P)} + A$$

26" = 0.075" in.
36" = 0.092" *

c. Pipe Minimum Wall Thickness Required by Axial Stresses :

- Axial Stress due to Design Cond.(P+DW), S_{Des} = 5600 psi
- Axial Stress due to Upset Cond.(P+DW+OBE), S_{Ups} = - psi
- Axial Stress due to Faulted Cond.(P+DW+DBE), S_{Fau} = - psi
- $t_1 = (S_{Des}/S)*t_{nom}$ = 0.14 in.
- $t_2 = (S_{Ups}/1.2S)*t_{nom}$ = - in.
- $t_3 = (S_{Fau}/1.8S)*t_{nom}$ = - in.

- t^{a}_{min} = Largest of (t_1,t_2,t_3) = 0.14 in.

d. Acceptability based on Minimum Wall Thickness Criteria :

- [✓] Accept But Monitor for $t_p \geq t^{h}_{min}$ & t^{a}_{min}
- [ ] Step 3 Evaluation Required for $t^{h}_{min} > t_p \geq t^{a}_{min}$
- [ ] Repair or Replacement for $t^{a}_{min} > t_p$

* For a unreinforced tee, the minimum thickness requirements around branch opening (page 4 of this evaluation form) shall be checked.

VALUATION OF PIPE WALL THINNING
Piping System : EXTRACT STEAM, PT. #2
Description : WALL THINNING AT 26"×36" TEE, SCH: STD
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

STEP 3 : LOCAL THINNING EVALUATION & ESTIMATEION OF REMAINING SERVICE LIFE

a. Pipe Parameters:

$R = D/2 =$ _____ in., $t_{min} = t^b_{min} =$ _____ in., $\sqrt{R*t_{min}} =$ _____ in.

b. Local Thinning Dimensions : (see Figure 7.2)

$L =$ _____ in., $L_s =$ _____ in., $L_{s(c)} =$ _____ in., $L_{s(c)} =$ _____ in.

$L_{s(c)} / \sqrt{R*t_{min}} =$ _____

c. Acceptable Local Thinning thicknesses:

- Case 1 : Applicable if $L_{s(c)} < \sqrt{R*t_{min}}$

  t_{alco}/t_{min} (from curve 1 in Figure 7.3) = _____

  $t_1 = (t_{alco}/t_{min})*t_{min}$ = _____ in.

- Case 2 : Applicable if $L_s < 2.65\sqrt{R*t_{min}}$ & $1.13t_{min} < t_{nom}$,

  $t_{21} = \left[\frac{1.5\sqrt{R*t_{min}}}{L}\left(1 - \frac{t_{nom}}{t_{min}}\right) + 1.\right]*t_{min}$ = _____ in.

  $t_{22} = (0.353\ L_s / \sqrt{R*t_{min}})*t_{min}$ = _____ in.

  t_2 = Larger of (t_{21}, t_{22}) = _____ in.

- Case 3 :

  t_{alco}/t_{min} (from Curve 2 in Figure 7.3) = _____

  $t_3 = (t_{alco}/t_{min})*t_{min}$ = _____ in.

- Minimum Acceptable Local Thickness

  t_{alco} = Minimum of (t_1, t_2, t_3) = _____ in.

d. Acceptability based on Local Thinning Critwia :

- [ ] Accept But Monitor for $t_p \geq t_{alco}$
- [ ] Repair or Replacement for $t_p < t_{alco}$

e. Pipe Wall Remaining Service Life (RSL):

- t_p = Larger of (t^b_{min}, t^a_{min}) if $t_p > t^b_{min}$ & t^a_{min} ✓
  = t_3 if $t^b_{min} > t_p \geq t^a_{min}$ = 0.179 in.
  $\geq 0.3*t_{nom}$

- RSL = $\frac{t_{nom} - t_p}{C}$ (where C= pipe thinning rate) = 7.1* yrs.

* IF THE THINNING IS INSIDE THE REINFORCEMENT AREA OF THE TEE RSL = 4.1 YEARS (SEE PAGE 4)

New York Power Authority

JAF NUCLEAR POWER PLANT

CALCULATION NO. EXAMPLE #2 REVISION ___ PAGE 4 OF 4

EVALUATION OF PIPE WALL THINNING

Piping System : EXTRACTION STEAM, PT #2
Description : WALL THINNING AT 36"x26" TEE, SCH STD.
Prepared By : _____ Date : _____
Checked By : _____ Date : _____

Minimum Wall Thickness for Unreinforced Branch Connection or Tee
(see Figure 7.4 for detail dimensions) y = 2 yrs, 7 yrs

1. Tee Dimensions:

a : angle between axes of run and branch	= 90°	deg.
d_i : ID of branch	= 25.25	in.
d_o : OD of branch	= 26	in.
t_p : min. predicted branch wall thickness	= 0.244	in. .181
t_{min} : min. required branch wall thk. for pressure	= 0.075	in.
D_o : OD of run pipe	= 36	in.
T_p : min. predicted run wall thickness	= 0.244	in. .181
T_{min} : min. required run wall thickness for pressure	= 0.092	in.

Reinforcement Dimensions:

$d_1 = d_i/\sin(a)$	= 25.25	in.
d_2 = greater of d_i or $(t_p+T_p+d_i/2)$ but not more D_o	= 29.25	in.
$L = 2.5*t_{nom}$ (t_{nom} : branch nom. thk.)	= 0.937	in.

3. Reinforced Area Required for pressure:

$A_{req} = 1.07\ T_{min}*d_1*(2-\sin(a))$ = 2.485 in²

4. Reinforcement Areas Provided:

$A_1 = d_2*(T_p-T_{min})$; excess wall thk. in run	= 3.838	in² 2.35
$A_2 = 2L*(t_p-t_{min})$; excess wall thk. in branch	= 0.316	in² .089
A_3 = area of filled welds	= ·	in²
A_4 = (OD of pad - d_i)*t_o; (t_o pad or saddle thk.)	= ·	in²
A_5 = (OD of saddle - d_i)*t_o; metal in saddle	= ·	in²
Total Area Provided : $A_{prov} = A_1+A_2+A_3+A_4+A_5$	= 4.154	in² 2.34

5. Acceptability of Thinning at Tee Reinforcement Area: OK MG#

[ ] Acceptable if $A_{req} \le A_{prov}$
[ ] Not Acceptable if $A_{req} > A_{prov}$

NYPA-7 CALCULATION FORM (SEPT. 1988)

* TO ESTIMATE THE REMAINING SERVICE LIFE (RSL) FOR THIS TEE:
... $A_{min} = d*(T-T_{min}) + 2L*(t-t_{min})$ very small

New York Power Authority

INFORMATION ONLY

NEAP - 26
Revision 2

NUCLEAR ENGINEERING ADMINISTRATIVE PROCEDURE

ADMINISTRATIVE CONTROLS FOR CONTAINMENT, Ia WELD & SUPPORT INSPECTION AND EROSION/CORROSION PROGRAMS AT INDIAN POINT 3 NUCLEAR POWER PLANT & JAMES A. FITZPATRICK NUCLEAR POWER PLANT

INFORMATION ONLY

☐ Full Revision ■ Limited Revision ☐ Editorial Change (RPO approval Only)

EFFECTIVE DATE:	PERIODIC REVIEW DATE:
10/14/98	10/14/2003

APPROVAL

Responsible Procedure Owner		
R. A. Penny:	10/2/98	
print name_signature_date		

☐ TSR ■ NTSRINFORMATIONAL USE

TABLE OF CONTENTS

NEAP 26, Rev. 2, Implementation Plan

ITEM	DESCRIPTION	RESPONSIBLE GROUP/PERSON	DUE DATE	ACTS #
1	Procedure training at IP3, JAF and WPO: By self study before the first use.	Not Required		
2	Distribute procedure	R. Becht	10/5/98	
3	Effective date for NEAP, Rev. 2	R. Becht	10/14/98	

List of Changes to NEAP 26, Revision 2

1. Incorporate Containment Inspections as required.

ADMINISTRATIVE CONTROLS FOR CONTAINMENT, WELD AND SUPPORT INSPECTION AND EROSION/CORROSION PROGRAMS AT INDIAN POINT 3 AND JAMES A. FITZPATRICK NUCLEAR POWER PLANTS

NEAP: 26

REV. NO: 2

1.0 PURPOSE

1.1 To establish administrative controls for development, and revision of **Containment,** Weld and Support Inspection and Erosion/Corrosion programs at the Indian Point 3 and James A. FitzPatrick Nuclear Power Plants. | a

2.0 APPLICABILITY

2.1 This procedure applies to the **Containment,** Weld and Support Inspection and the Erosion/Corrosion programs at Indian Point 3 Nuclear Power Plant (IP3) and James A. FitzPatrick (JAF). Development and revision of these programs shall be performed to this procedure. | a

3.0 REFERENCES

3.1 10CFR50.55a, "Codes and Standards".

3.2 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI.

3.3 10CFR50.2V, "Definitions".

3.4 Indian Point 3, Technical Specification, Sections 4.2 and 4.9. | a

3.5 J. A. FitzPatrick, Technical Specification, Section 4.6 F.3.

3.6 IP3, ISI Ten-Year Program Plan, latest revision.

3.7 JAF, Inservice Inspection Program, latest revision.

3.8 Nuclear Administrative Policy 5.2, "Inservice Inspection Programs".

3.9 NRC Regulatory Guide 1.26, "Quality Group Classification for Water, Steam, and Radioactive-Waste Containing Components for Nuclear Power Plants".

3.10 IP3, AP-39, ASME Section XI, Repair & Replacement Program.

3.11 JAFP-87-0737, dated 9/18/87, "Response to NRC Bulletin 87-01 Thinning of Pipe Walls in Nuclear Power Plants".

3.12 JPN-89-051, "Response to NRC Generic Letter 89-08 Erosion/Corrosion - Induced Pipe Wall Thinning".

3.13 NUREG-1344, "Erosion/Corrosion Induced Pipe Wall Thinning in U.S. Nuclear Power Plants".

3.14 NRC Bulletin No. 87-01: "Thinning of Pipe Walls in Nuclear Power Plants".

3.15 NYPA Letter to NRC, IP3-87-055Z, September 15, 1987, "Response to NRC IE Bulletin 87-01".

3.16 NRC Information Notice 87-17, "Summary of Responses to NRC Bulletin 87-01, Thinning of Pipe Walls in Nuclear Power Plants".

3.17 EPRI NP-3944, "Erosion/Corrosion in Nuclear Plant Steam Piping: Cause and Inspection Program Guidelines", April 1985.

3.18 EPRI Report, "Single-Phase Erosion/Corrosion of Carbon Steel Piping", 2/19/87.

3.19 EPRI Report - "Practical Considerations for the Repair of Piping Systems Damaged by Erosion/Corrosion", dated 10/5/87.

3.20 EPRI NP-5911 M "Acceptance Criteria for Structural Evaluation of Erosion/ Corrosion Thinning in Carbon Steel Piping", dated 7/88.

3.21 EPRI Report NSAC/202L, - "Recommendation for an Effective Flow Accelerated Corrosion Program", latest revision.

3.22 INPO Significant Operating Experience Report (SOER) 82-11, "Erosion of Steam Piping and Resulting Failure", February 1982.

3.23 INPO SOER 87-3, "Piping Failures in High-Energy Systems Due to Erosion/ Corrosion", March 1987.

3.24 NRC Generic Letter 89-08, "Erosion/Corrosion - Induced Pipe Wall Thinning".

3.25 NYPA Letter to NRC, IPN-89-044, "Response to NRC Generic Letter 89-08, Erosion/Corrosion-Induced Pipe Wall Thinning".

3.26 EPRI CHECWORKS Computer Program Users Guide, TR-103496.

3.27 EPRI CHECMATE and CHEC-NDE Erosion/Corrosion Computer programs.

3.28 EPRI Checmate Computer Manual, NSAC/145L, latest revision.

3.29 AP-05.14 JAF Repair/Replacement Program.

3.30 AP-49, Inservice Inspection IP3 Program Implementation Procedure.

3.31 AP-19.03, JAF Erosion/Corrosion Implementation Procedure.

3.32 AP-19.06, Inservice Inspection, JAF Implementation Procedure.

4.0 TERMS AND DEFINITIONS

4.1 ISI - Inservice Inspection.

4.2 NDE - Non-Destructive Examination.

4.3 ANI - Authorized Nuclear Inspector.
4.4 ANII - Authorized Nuclear Inservice Inspector.

4.5 DER - Deviation and Event Report.

4.6 Erosion/Corrosion - Flow accelerated erosion process that causes pipe wall thinning in water or wet steam systems.

4.7 ISI Class - Components are classified as ISI Class 1, 2, and/or 3 **(plus 2A & 3A @ JAF), MC & CC** in accordance with Regulatory Guide 1.26, 10CFR50.2V, and/or the ISI Program Plan. | a

5.0 RESPONSIBILITIES

5.1 Vice-President Engineering

5.1.1 Shall ensure the Inservice Inspection (ISI) and Erosion/Corrosion (E/C) programs are controlled and properly implemented at IP3 and JAF.

5.2 Director - Engineering Programs (WPO)

5.2.1 Control the development of the ISI and Erosion/Corrosion program plans.

5.2.2 Ensure the **containment**, Weld and Support, and Erosion/Corrosion programs meet all applicable ASME Code, Regulatory, Plant Technical Specification and Safety requirements. | a

5.2.3 Designate a Responsible Engineer from the Engineering Programs group in the White Plains Office to develop and maintain the Erosion/Corrosion, **Containment** and Weld and Support **Inspection** programs. | a

5.2.4 Ensure the timely submittal of reports to regulatory agencies.

5.3 ISI Erosion/Corrosion and/or Responsible Containment Engineer

5.3.1 Shall ensure that these programs conform to committed Regulatory requirements and/or the appropriate edition and addenda of the ASME Code.

5.3.2 Shall revise the ISI and Erosion/Corrosion programs to incorporate modifications, changes and revisions to the components and systems in these programs.

5.3.3 Shall ensure the appropriate inspections are performed in accordance with the applicable codes, standards, and Technical Specifications as applied to these programs.

5.3.4 Shall ensure that all repairs and replacements performed on components and/or systems within the ISI program are conducted in accordance with applicable plant procedures and ISI program requirements.

5.3.5 Under the guidance of the Concrete Engineer, the ISI Engineer shall be responsible for the development of plans and procedures for examination of concrete surface; evaluation of results; and preparation of repair procedures **(IP3 Only).** |a

5.4 Concrete Engineer (IP3)

5.4.1 This individual is a member of the Design Engineering - Civil/Structural Group at IP3, and shall either be a registered Professional Engineer, or work under the guidance of a registered Professional Engineer. |a

5.4.2 Provide guidance to the ISI Engineer in the devolopment of plans and procedures for examination of concrete surface; evaluation of examination results; and preparation of repair procedures. |a

6.0 REQUIREMENTS

6.1 In-Service Inspection Program Requirements

6.1.1 Under the provisions of 10CFR50.55a and the IP3 and JAF Technical Specifications, both plants are responsible for performing inservice inspections on components classified as ISI Class 1, 2, and 3, **MC and/or CC**. Code classification is performed in accordance with Regulatory Guide 1.26, 10CFR50.2V and as detailed in the ISI program Manual. Once classified, guidance for the inspection of these systems and components is contained in ASME Code, Section XI, "Inservice Inspection". |a

6.1.2 In addition, the Authority is required to examine components that are not code classified, but considered important to safety. Such examinations are included in the Inservice Inspection program as "Augmented Inservice Inspections". Augmented inspections may also include the examination of code classified components and/or systems more frequently than required by the code.

6.1.3 The Ten-Year ISI Program Plan itemizes the various commitments, NRC approved relief requests, plant Technical Specifications and program requirements.

6.1.4 The ISI program shall be revised **periodically** to reflect modifications to safety-related and augmented systems. |r

6.1.5 Development and revision of the ISI program shall conform to NRC regulations concerning both ASME code and non-code or augmented inspections as well as approved associated relief requests. Additionally, Reference 3.1 requires the update of the ISI program at the end of the ASME Code 10-year Inspection Interval. Revisions to the program shall also include in-house recommended changes to increase the availability and reliability of the plant, when practical.

NOTE: For those revisions that have not yet been incorporated into the ISI Program, Attachment 1 shall be used to document programmatic changes.

6.1.6 The specific process for development, revision and implementation to the ISI program shall be performed in accordance with the applicable plant procedures.

6.1.7 Repairs or replacements to components or systems within the ISI Class 1, 2, 3, **MC and/or CC** boundaries shall be performed in accordance with the ISI Program Manual, ASME Section XI and applicable plant procedures. | a

6.2 Erosion/Corrosion Program Requirements IP3 and JAF

6.2.1 Due to concerns raised in NRC Bulletin 87-01, Generic Letter 89-08, and other industry reports, the Authority has committed to an inspection program that will identify evidence of wall thinning in both safety-related and non-safety-related systems. These systems and piping configurations shall be inspected, as necessary, in accordance with applicable plant procedures to assure the structural integrity of the affected systems.

6.2.2 The IP3 and JAF Erosion/Corrosion programs will be maintained and implemented by the Responsible Engineer in accordance with this procedure and the applicable site Administrative Procedures (AP).

6.2.3 Revisions to the Erosion/Corrosion program shall be in accordance with applicable corporate engineering procedures.

NOTE: For those revisions that have not yet been incorporated into the ISI Program, Attachment 1 shall be used to document programmatic changes.

6.3 Programmatic Overview

6.3.1 The JAF and IP3 Responsible Engineers are required to provide industry guidance (EPRI, BWROG, & PWROG) and technical expertise, for the following plant controlled programs.

- Steam Generator Inspection Program (IP3 Only)
- Snubber Inspection Program
- Pressure Test Program
- Eddy Current Testing Program
- Repair and Replacement Program
- ISI (Pump & Valve Program)
- Service Water Program
- Augmented stress corrosion cracking (IGSCC)

7.0 DOCUMENTATION

7.1 Document Control

7.1.1 Document control shall be maintained in accordance with applicable plant and corporate engineering procedures.

ATTACHMENT 1

SUBJECT: REVISION OF THE ISI PROGRAM

TO: _____ DATE: _____

REASON FOR CHANGE: _

INCORPORATION OF CHANGE

DRAWINGS:

PROGRAM MANUAL:

COMPUTER DATABASE:

PREPARED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____