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Nuclear

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U. S. Nuclear Regulatory Commission
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Clinton Power Station, Unit 1
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Subject: Submittal of Program for the Second 10-Year Interval Containment Inservice Inspection Plan

In accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, IWA-1400(c), "Owners Responsibilities," Exelon Generation Company (EGC), LLC is providing for your information the Clinton Power Station Containment Inservice Inspection (ISI) Program plan for the second 10-year inspection interval. The enclosed plan complies with the 2001 Edition (through 2003 Addenda) of the ASME Section XI Code and does not contain any relief requests and, therefore, does not require NRC approval.

This letter contains no regulatory commitments.

If you have any questions regarding this letter, please contact Mr. Jim Peterson at (217) 937-2810.

Respectfully,


E. A. Kearney
Site Vice President
Clinton Power Station

JLP/blf

Enclosure – Clinton Power Station IWE/IWL Containment Inspection Program

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Clinton Power Station

AOIT
NRR

CLINTON POWER STATION
INSERVICE INSPECTION
PLAN

NUCLEAR STATION ENGINEERING DEPARTMENT
INSERVICE INSPECTION (ISI) SECTION

IWE/IWL

CONTAINMENT INSPECTION PROGRAM

Scope of revision: Entire document revised to reflect Section XI, 2001 Edition through 2003 Addenda and 10CFR50.55a requirements for the second ten-year interval. This is a major revision and revision bars are not included.

REVISION - 5

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I. PURPOSE

The purpose of this Plan is to delineate standardized methods and controls for the development, administration, and implementation of Clinton Power Station's (CPS) Containment Inspection Program. The standardized methodology described in this document will provide a consistent approach in ensuring compliance to the applicable rules and requirements specified by Part 50.55a, Codes and Standards, of Title 10 of the Code of Federal Regulation and the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI.

II. SCOPE

This document provides the rules and requirements for preservice examination and inservice examination, repair and replacement of primary containment Class MC and Class CC pressure retaining components and their integral attachments. Based on the requirements of ASME Section XI and the Nuclear Regulatory Commission, the following Class MC and Class CC non exempt pressure retaining components and their integral attachments are subject to examination during the first inspection interval.

NOTE: Clinton Power Station does not utilize an unbonded post-tensioning system. For this reason, the rules and requirements associated with this system will NOT be addressed.

A. Components Subject to Examination

1. Class MC (ASME Section XI, IWE)
 - a. Containment Metallic Liner
 - b. Containment Penetrations
 1. Piping
 2. Electrical
 3. Personnel Airlocks
 4. Equipment Hatch
 5. Inclined Fuel Transfer Tube
2. Class CC (ASME Section XI, IWL)
 - a. Concrete Containment Accessible Interior And Exterior Surfaces

B. Components Exempted from Examination

1. Class MC (ASME Section XI, IWE)

The following components (or parts of components) are exempted from the examination requirements of IWE-2000:

- a. vessels, parts, and appurtenances that are outside the boundaries of the containment as defined in the Design Specifications;
- b. embedded or inaccessible portions of containment vessels, parts, and appurtenances that met the requirements of the original Construction Code;
- c. portions of containment vessels, parts, and appurtenances that become embedded or inaccessible as a result of vessel repair or replacement if the conditions of IWE-1232(a) and IWE-5220 are met;
- d. piping, pumps, and valves that are part of the containment system, or which penetrate or are attached to the containment vessel. These components shall be examined in accordance with the rules of IWB or IWC, as appropriate to the classification defined by the Design Specifications.

2. Class CC (ASME Section XI, IWL)

The following items are exempt from the examination requirements of IWL-2000:

- a. portions of the concrete surface that are covered by the liner, foundation material, or backfill, or are otherwise obstructed by adjacent structures, components, parts, or appurtenances.

III. REFERENCES

A. Code and Standards

1. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Component, 2001 Edition through the 2003 Addenda (hereafter referred to as the ASME Section XI Code)
2. ASME Code Cases, Nuclear Components

None implemented at this time

B. Regulatory Documents

1. Part 50.55a, Codes and Standards, of Title 10 of the Code of Federal Regulation (§50.55a)
2. Appendix J, Part 50 of Title 10 of the Code of Federal Regulation (hereafter referred to as Appendix J)
3. Regulatory Guide 1.147, Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1
4. NUREG-1522, Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures (Dated June 1995)
5. Nuclear Regulatory Commission (NRC) Inspection Procedure 62003, Inspection of Steel and Concrete Containment Structures at Nuclear Power Plants (Dated June 1997)
6. Information Notice (IN) 86-99, Degradation of Steel Containment (Dated December 8, 1986)
7. IN 86-99, Supplement 1, Degradation of Steel Containment (Dated February 14, 1991)
8. IN 89-79, Degraded Coating and Corrosion of Steel Containment Vessels (Dated December 1, 1989)
9. IN 89-79, Supplement 1, Degraded Coating and Corrosion of Steel Containment Vessels (Dated June 29, 1990)
10. IN 97-10, Liner Plate Corrosion in Concrete Containments (Dated March 13, 1997)
11. IN 97-11, Cement Erosion from Containment Subfoundations at Nuclear Power Plants (Dated March 21, 1997)
12. IN 97-13, Deficient Conditions Associated with Protective Coating at Nuclear Power Plants (Dated March 24, 1997)
13. IN 97-29, Containment Inspection Rule (Dated May 30, 1997)

C. Electric Power Research Institute (EPRI) Documents

1. EPRI Containment Inspection Program Guide (March 2000, AP110698-RI)

IV. DEFINITIONS

- A. Accessible Surface Areas - as described in IWE-1231.
- B. Auxiliary Lighting - an artificial light source used as a visual aid to improve viewing conditions and visual perception (Section V - '01/'03, Article 9, Mandatory Appendix).
- C. Coating - this term applies to coatings (including paints) that are used to protect an ASME Code Class MC component against corrosion.
- D. Component - this term applies to metallic components (e.g., vessels, metallic liners, appurtenances, etc.) and reinforcing concrete components (e.g., concrete containment shell) that have been classified as ASME Code Class MC or CC, respectively.
- E. Component Support - a metal support designed to transmit loads from a component to the load-carrying building or foundation structure. Component supports include piping supports and encompass those structural elements relied upon to either support the weight or provide structural stability to components (Section XI - '01/'03, IWA-9000).
- F. Construction Code - this term applies to a nationally recognized Code, Standard, and/or Specification (e.g., ASME, ASTM, ANSI, AWS, etc.) including designated Cases, providing construction requirement for a component or item.
- G. Containment Component - as applied to IWE or IWL the term component refers to a part that is designed to support the load of the containment inside pressure in the event of a reactor coolant or steam system leak, such as, containment vessels, vent systems, airlock/equipment hatch, etc.
- H. Containment Nonstructural Attachment - (also referred to as minor permanent and temporary attachments) those attachments that do not perform a pressure retaining function nor are they in the containment vessel support load path. Containment nonstructural attachments include items such as nameplates, insulation supports, and locating & lifting lugs.. (Based on Section III - '01/'03, NE-1132.1(e)).
- I. Containment Structural Integral Attachment - attachments with a structural function (structural attachments) perform a pressure retaining function or are in the containment vessel support load path. (Based on Section III - '01/'03, NE-1132.1(d)).
- J. Defect - a flaw (imperfection or unintentional discontinuity) of such size, shape, orientation, location, or properties as to be rejectable (Section XI, '01/'03, IWA-9000).

- K. Design Specification - a document prepared which provides a complete basis for construction in accordance with the Construction Code.
- L. Direct Visual Examination - a visual examination technique performed by eye and without any visual aids (excluding light source, mirrors, and/or corrective lenses) (Section V - '01/'03, Article 9, Mandatory Appendix).
- M. Discontinuity - a lack of continuity or cohesion; an interruption in the normal physical structure of material or a product (Section XI, '01/'03, IWA-9000).
- N. Enforcement Authorities - a regional or local governing body, such as the State of Illinois, empowered to enact and enforce Boiler and Pressure Vessel Code legislation.
- O. Flaw - an imperfection or unintentional discontinuity which is detectable by a nondestructive examination (Section XI, '01/'03, IWA-9000).
- P. General Visual Examination - a visual examination performed either directly or remotely with sufficient illumination and resolution suitable for the local environment to assess general conditions that may affect either the structural integrity or leak tightness of the pressure retaining component (as described in IWE-2310 a and b).
- Q. Inaccessible Surface Areas - as described in IWE-1232.
- R. Indication - the response or evidence from the application of a nondestructive examination (Section XI, '01/'03, IWA-9000).
- S. Inspection Period - this term applies to the calendar years of plant service (i.e., 3, 7, and 10), within the Inspection Interval, for which the performance of the minimum examinations are to be completed for each of the applicable Examination Categories (Table IWE-2500-1). The following second interval refueling outages in each period have been identified:
- First – September 10, 2008 to September 9, 2011 and will have one (1) refueling outage, C1R12.
 - Second – September 10, 2011 to September 9, 2015 and will have two (2) refueling outages, C1R13 and C1R14*.
 - Third – September 10, 2015 to September 9, 2018 and will have two (2) refueling outages, C1R15 and C1R16*.
- * Outages scheduled past 12/31/2012 are tentative dates (placeholders).
- T. Inspection Interval - this term applies to ten calendar years of plant service following the start of the Second Containment Inspection Interval. The start date of the Second Containment Inspection Interval

is September 10, 2008 and continues to September 9, 2018 based upon 10 CFR50.55a(g)(4), see 1-31-2008 version.

- U. Integral Attachments - this term applies to attachments that have a pressure retaining function or in the component's support load path and are welded, cast, or forged integrally to the inside or outside surface of the pressure retaining component.
- V. Item - this term applies to items (e.g., seals, gaskets, bolting, etc.) that have been classified as ASME Code Class MC or CC.
- W. Leak-Tight Integrity - the ability of a component to maintain a prescribed maximum leakage rate under service conditions.
- X. Liner - a permanent metal membrane attached to the surface of a concrete containment or penetration in order to form a leak-tight enclosure.
- Y. Method - the following is a list of nondestructive examination methods and respective abbreviations used within the scope of Section V: RT - Radiography; UT - Ultrasonics; MT - Magnetic Particle; PT - Liquid Penetrant; VT - Visual; LT - Leak Testing; ET - Electromagnetic (Eddy Current); and AE - Acoustic Emission (Section V - '01/'03, Article 1, Mandatory Appendix).
- Z. Nondestructive Examination - an examination by the visual, surface, or volumetric method (Section XI - '01/'03, IWA-9000).
- AA. One-Sided Examinations - Examination conducted from only one side of the area to be examined, e.g., from the inside or outside surface of the containment liner.
- BB. Pressure Retaining - this term applies to components that are necessary to maintain a pressure difference across its boundary. Items such as seals, packing, gaskets, wear plates, and materials used for electrical conducting and insulating functions in electrical penetration assemblies are NOT considered pressure retaining.
- CC. Primary Containment Structure - this term applies to the principal enclosures (e.g., containment vessel, access closures, penetration sleeves, appurtenance, etc.) that acts as a leakage barrier, after the reactor coolant pressure boundary, to control the release of radioactive material from the fuel in the reactor core under design basis accident conditions.
- DD. Reinforced Concrete - Concrete containing reinforcement and designed so that the two materials act together in resisting force.

- EE. Remote Visual Examination - a visual examination technique used with visual aids for conditions where the area to be examined is inaccessible for direct visual examination (Section V - '01/'03, Article 9, Mandatory Appendix I).
- FF. Structural Integrity Test - the initial or subsequent pressure test of a containment structure to demonstrate the ability to withstand the prescribed loads (Section XI, '01/'03 IWA-9000).
- GG. Support - (1) an item used to position components, resist gravity, resist dynamic loading, or maintain equilibrium of components; (2) an item that carries the weight of a component or piping from below with the supporting members being mainly in compression (Section XI, '01/'03 IWA-9000).

V. RESPONSIBILITIES

A. Manager – Engineering Programs

The Manager has overall responsibility for the development, administration, and implementation of the Inspection Program. The Manager is responsible for assuring the individual(s) who will function as the Program Owner and the Responsible Engineer have been designated.

B. Containment Inspection Program Owner/Manager (Cognizant Engineer – Inservice Inspection)

The Containment Inspection Program Owner/Manager (hereafter referred to as the Program Owner) responsibilities are defined in procedure ER-AA-330.

C. IWE Responsible Individual(s) – (Cognizant Engineer – NSED Design)

The IWE Responsible Individual(s) (hereafter referred to as the Responsible Individual) responsibilities are defined in procedure ER-AA-330-007.

D. IWL Responsible Engineer(s) – (Cognizant Engineer – NSED Design, a Registered Professional Engineer)

The IWL Responsible Engineer (hereafter referred to as the Responsible Engineer) responsibilities are defined in procedure ER-AA-330-005.

VI. PRECAUTIONS AND LIMITATIONS

The requirements outlined in this document are NOT to CONFLICT with plant specific Technical Specifications, Design Specifications, Regulatory Commitments, and/or approved Relief Requests. In case of a conflict, the applicable plant specific document(s) will govern.

VII. REQUIREMENTS

A. GENERAL REQUIREMENTS

This section provides general requirements for components and/or items classified as ASME Code Class MC or ASME Code Class CC.

1. §50.55a, Codes and Standards

- a) In addition to the requirements of the ASME Section XI Code, the applicable modifications and limitations outlined in §50.55a(b)(2)(viii) and §50.55a(b)(2)(ix) **SHALL** also be IMPLEMENTED.

2. Edition and Addenda of the ASME Section XI Code

The applicable requirements of Subsection IWA (General Requirements), Subsection IWE (Requirements for Class MC and Metallic Liners of Class CC Components), and Subsection IWL (Requirements for Class CC Concrete Components) of the 2001 Edition through the 2003 Addenda of the ASME Section XI Code **SHALL** apply to components and items classified as ASME Code Class MC or ASME Code Class CC.

3. Design and Access Limitations

For existing plant components and/or items, §50.55a(g)(4) allows exception from the design and access provisions outlined in the ASME Section XI Code (e.g., IWA-1500). When design and/or accessibility limitations are identified, a request for relief from the applicable provision is **NOT** required **PROVIDED** the limitations are identified in the Inspection Program.

4. Inaccessible Surface Areas

Inaccessible surface areas of components or items are **EXEMPTED** from examination **PROVIDED** they have met the requirements of the original Construction Code and/or Design Specification. Examples of surface areas that are considered inaccessible are listed below (as per IWE-1232).

- a) Portions of Class MC containment vessels, parts, and appurtenances that are embedded in concrete or otherwise made inaccessible during construction of the vessel or as a result of vessel repair/replacement activities are exempted from examination, provided:
 - i) no openings or penetrations are embedded in the concrete;
 - ii) all welded joints that are inaccessible for examination are double butt welded and are fully radiographed and, prior to being covered, are tested for leak tightness using a gas medium test, such as Halide Leak Detector Test; and
 - iii) the vessel is leak rate tested after completion of construction or repair/replacement activities to the leak rate requirements of the Design Specifications.
- b) Portions of Class CC metallic shell and penetration liners that are embedded in concrete or otherwise made inaccessible during construction or as a result of repair/replacement activities are

exempted from examination provided:

- i) all welded joints that are inaccessible for examination are examined in accordance with CC-5520 and, prior to being covered or otherwise obstructed by adjacent structures, components, parts, or appurtenances, are tested for leak tightness in accordance with CC-5536; and
 - ii) the containment is leak rate tested after completion of construction or repair replacement activities to the leak rate requirements of the Design Specifications.
- c) Surface areas of Class MC containment vessels, parts and appurtenances, and surface areas of Class CC metallic shell and penetration liners may be considered inaccessible if visual access by line of sight with adequate lighting from permanent vantage points is obstructed by permanent plant structures, equipment, or components, provided these surface areas do not require examination in accordance with the inspection plan or IWE-1240.

5. Qualification of Responsible Engineer/Individual

- a) The Responsible Engineer – NSED Design **SHALL** be a Registered Professional Engineer (RPE).
- b) The Responsible Individual/Engineer **SHALL** be an individual knowledgeable in the requirements for design, inservice inspection and testing of ASME Class MC and CC components.
- c) The Responsible Individual(s)/Engineer(s) **SHALL** be qualified in accordance with the Exelon Training Program and the training program **SHALL** address the knowledge and skill level necessary to independently perform the applicable tasks outlined for the Responsible Individual/Engineer.

6. Qualification of Nondestructive Examination Personnel

Personnel performing examinations of ASME Code Class MC or ASME Code Class CC components or items **SHALL** be qualified and certified in accordance with the Exelon Nondestructive Examination Personnel Qualification and Certification Program.

7. Coatings Program

The application and maintenance of protective coatings on metal containment and concrete containment **SHALL** be controlled and administered in accordance with CPS 1080.01, CPS PROTECTIVE COATING PROGRAM.

B. REQUIREMENTS FOR ASME CODE CLASS MC COMPONENTS AND ITEMS

This section provides the requirements for classification and inservice inspection of components and/or items classified as ASME Code Class MC.

1. Classification of Components and Items

- a) Components or portions thereof that **COMPRISE** the pressure retaining boundary of the Primary Containment structure **SHALL** be **CLASSIFIED** as ASME Code Class MC. Examples of components that are to be classified:
 - (1) metallic liner of a concrete containment vessel;
 - (2) metallic portions of a concrete containment vessel not reinforced by concrete;
 - (3) penetration sleeves extending the metallic containment liner through the surrounding shell concrete;
 - (4) personnel/equipment airlocks;
 - (5) vent piping that connects the Drywell and Suppression Chamber;
 - (6) bolted connections that are required to assure pressure retaining integrity of the containment vessel.
- b) Components, items, or portions thereof that are required to **SUPPORT** the structural integrity function of the Primary Containment structure, but are **NOT** part of its pressure retaining boundary, **SHALL** be **CLASSIFIED** as ASME Code Class MC. Examples of components and items that are to be classified:
 - (1) portions of the Vent System (e.g., ring header, downcomers, etc.) inside the Suppression Chamber; and/or

- (2) bolting (e.g., bolts, studs, nuts, bushings, washers, etc.) on bolted connections that are required to assure pressure retaining integrity of the containment vessel.
- c) Items that are required to SUPPORT the leak-tight integrity function or used to PROTECT the pressure retaining boundary of the Primary Containment structure, but are NOT part of its pressure retaining boundary, **SHALL** be CLASSIFIED as ASME Code Class MC. Examples of items that are to be classified:
 - (1) moisture barriers at the concrete-to-metallic liner interface.

NOTE: Nonstructural attachments are NOT required to be classified.

- d) Integral attachments that have a pressure retaining function or in the component's support load path **SHALL** be CLASSIFIED as ASME Code Class MC. Examples of integral attachments that are to be classified:
 - 1) stiffeners and opening reinforcements;
 - 2) saddles;
 - 3) supports; and/or
 - 4) shear lugs, brackets, and skirts.

2. Classification Boundary

NOTE: The classification boundary defines the surface areas subject to inservice inspection.

- a) For pressure retaining components (e.g., vessel, metallic liner, penetration sleeves, etc.), the ASME Code Class MC boundary **SHALL ENCOMPASS** the INACCESSIBLE and ACCESSIBLE surface areas that comprise the pressure retaining boundary.
- b) For integral attachments that perform a pressure retaining functions (e.g., stiffeners and opening reinforcements), the ASME Code Class MC boundary **SHALL ENCOMPASS** the INACCESSIBLE and ACCESSIBLE surface areas.
- c) For integral attachments that are within the component's load path (e.g., saddles, supports, shear lugs, etc.), the

ASME Code Class MC boundary **SHALL** extend to and include INACCESSIBLE and ACCESSIBLE surface areas for a minimum of $2t$ (t is the nominal thickness of the pressure retaining component to which the attachment is attached).

d) The interface between the ASME Code Class MC boundary and other plant equipment (e.g., piping, valves, etc.) **SHALL NOT** be closer to the ASME Code Class MC component than:

- (1) the first circumferential joint in welded connections (the connecting weld is considered part of the plant equipment);
- (2) the face of the first flange in bolted connections (the bolts are considered part of the plant equipment); or
- (3) the first threaded joint in screwed connections.

e) Containment internal structures (reactor shield wall, drywell structure, suppression pool weir wall, reactor pedestal, miscellaneous platforms and galleries, containment pool, refueling floor, equipment rooms, process pipe tunnel and support system for the recirculation pumps) **DO NOT** constitute a part of the Containment Boundary and therefore are not subject to the requirements of this program.

f) The following further clarifies the IWE Code boundaries:

- (1) The containment pressure boundary liner and liner seam welds are part of the **IWE Code** boundary.
- (2) The liner anchorage in concrete and associated welds to the liner are not **IWE Code** items.
- (3) The leak-chase channels and structural angle supports are not IWE items. However, their attachment welds to the liner are **IWE Code** welds.
- (4) The full penetration welds between the liner (backed by concrete) and the penetration sleeve are part of **IWE Code** boundary.
- (5) Containment penetration sleeves are **IWE Code** items.
- (6) The end closure plates for all liner penetrations are part of **IWE Code** boundary. However, the welds

attaching the end plates to the process pipe are part of the Piping Code.

- (7) The flued head attachment weld to the penetration sleeve is an IWE Code weld. However, the flued heads and their attachments to the process piping are Piping Code items.
- (8) Integral Embedment plates in the liner and the associated full penetration welds between the liner and the embed plates are part of the IWE Code pressure boundary.
- (9) Structural attachments to the Integral Embedments are not IWE Code items. However, their attachments welds to embedment plates are IWE Code welds.

3. Surface Areas Requiring Augmented Examination

NOTE: Guidance for determining surface areas likely to experience accelerated degradation and aging is outlined in IWE-1241(a), (b) and (c).

- a) As part of the initial development of the Inspection Program, an engineering evaluation **SHALL** be **PERFORMED** to identify surface areas of components likely to experience accelerated degradation and aging.
- b) The approved engineering evaluation is **REFERENCED** in this Inspection Program, Section IX.
- c) Each surface area that is identified **SHALL** be **INCLUDED** in the Inspection Plan and **SUBJECT** to the requirements of Examination Category E-C.
- d) If the surface area remains **ESSENTIALLY UNCHANGED** for the next Inspection Period, augmented examinations in accordance Examination Category E-C are **NO** longer required and the component can be returned to its normal examination frequency.

4. Examination Requirements

- a) Preservice Examinations

NOTE: Non-pressure retaining components and/or items (e.g., seals, gaskets, moisture barriers, etc.) that are excluded from the repair/replacement requirements of IWA-4000, are exempted from preservice examination.

- (1) Following a repair/replacement activity, a preservice examination **SHALL** be PERFORMED.
- (2) When a protective coating is REAPPLIED following a repair/replacement activity, the examination **SHALL** be PERFORMED in accordance with the CPS Coatings Program.
- (3) When a leakage test is required, the preservice examination may be PERFORMED either prior to or following the leakage test.

b) Inservice Examinations

- (1) Inservice examinations **SHALL** be PERFORMED as required to satisfy the extent and frequency outlined in the applicable Examination Category (Table IWE-2500-1).
- (2) The sequence of inservice examinations **SHALL** be REPEATED during each successive Inspection Interval, to the extent practical.
- (3) When an area of degradation is detected, the inservice examination results **SHALL** be COMPARED with recorded results of preservice examination and/or prior inservice examinations to verify any changes.
- (4) Verified changes to an area of degradation **SHALL** be RECORDED as part of the examination record.
- (5) When a protective coating is REMOVED for an activity other than touch-up of the topcoat, the requirements of the CPS Coatings Program will be applied.

c) Supplemental Examinations

NOTE: Supplemental examinations are NOT required on areas of degradation identified on non-pressure retaining items (e.g., seals, gaskets, moisture barriers) or protective coating.

- (1) Areas of degradation identified during an inservice examination **SHALL** be SUPPLEMENTED by either surface or volumetric examination.

d) Augmented Examinations

- (1) Augmented examinations **SHALL** be PERFORMED as required to satisfy the extent and frequency outlined in the Examination Category E-C (Table IWE-2500-1).
 - (2) The examination methods **SHALL COMPLY** with the criteria specified in IWE-2500(b).
- e) Surface Condition
- (1) When a component is painted or coated to protect the surface area from corrosion, the examinations **SHALL** be PERFORMED without the removal of the paint or coating.
 - (2) When removal of coating is required, the coating **SHALL** be removed in a manner that will **NOT** reduce the material thickness below the DESIGN thickness.

5. Examination Boundary

NOTE: The examination boundaries described below may **NOT** match the classification boundary defined at Clinton. In these cases, the examination boundary is **NOT** to alter the classification boundary.

- a) The preservice and inservice examination boundary for components **SHALL** include the **ACCESSIBLE INTERIOR** and **EXTERIOR** surface areas (including welds and base metal). For penetration sleeves, the examination boundary is further clarified as follows:
 - (1) For penetration sleeves connected to a flued head, the examination boundary **SHOULD** extend to the surface of the process piping (the process piping is excluded from the requirements of Subsection IWE).
 - (2) For penetration sleeves connected to an end cap, the examination boundary **SHOULD** extend to the weld that joins the end cap to the process piping (the interfacing weld and heat affected zone (i.e., 1/2 inch from the toe of the weld), is considered part of the process piping and excluded from the requirements of Subsection IWE).
 - (3) For penetration sleeves that are connected to plant equipment (e.g., piping, valves, etc.) by a bolted connection, the examination boundary **SHOULD**

extend to the face of the first flange (the bolting and interfacing flange are considered part of the plant equipment and excluded from the requirements of Subsection IWE).

- (4) For penetration sleeves with a bolted connection and NOT connected to plant equipment (e.g., access hatches, equipment hatches, etc.), the examination boundary SHOULD extend to and include both mating surfaces and the removal cover.
 - (5) For penetration sleeves with a screwed connection, the examination boundary SHOULD extend to and include the first threaded joint in the screwed connections (the interfacing connection is considered part of the plant equipment and excluded from the requirements of Subsection IWE).
 - (6) For spare penetration sleeves that are capped or flanged, the examination boundary SHOULD extend to and include the cap or flange.
 - (7) For penetration sleeves that contain non-Class 1 or 2 piping (e.g., spare piping, piping no longer in service, etc.), the examination boundary SHOULD extend to and include the non-Class piping and pipe cap.
- b) The preservice and/or inservice examination boundary for items (e.g., moisture barriers, bolting, etc.) **SHALL** include ACCESSIBLE surface areas.
- c) The preservice and inservice examination boundary for integral attachments **SHALL** include the ACCESSIBLE surface areas as follows:
- (1) For welded integral attachments, the weld (connecting the attachment to the pressure retaining component) and a minimum of 1/2 inch on either side of the weld toe.
 - (2) For non-welded integral attachments, a minimum of $2t$ for the pressure retaining boundary where t is the nominal thickness of the pressure retaining component.

6. Inspection Schedule

- a) The inspection schedule **SHALL** comply with the requirements of Inspection Program B as described in IWE-2412.

NOTE: As clarified in NRC Inspection Manual 62003, the requirements of Table IWE 2500-1 will govern in cases of contradiction with the requirements of IWE-2400.

- b) With the exception of the examinations that may be deferred until the end of an Inspection Interval, the minimum required examinations and the maximum examinations credited during an Inspection Period **SHALL** be in accordance with Table IWE-2412-1.
- c) An Inspection Period may be decreased or extended by as much as one year to enable examinations to coincide with a plant outage PROVIDED the limitation of IWA-2430(d) is met.

7. Leakage Tests

- a) EXCEPT as allowed in the following step, repair/replacement activity **PERFORMED** on a component that is part of the pressure retaining boundary of the Primary Containment structure **SHALL** be SUBJECT to a pneumatic leakage test in accordance with the provisions of Appendix J PRIOR to returning the component to service.
- b) Repair/replacement activities that meet one of the conditions listed below can be DEFERRED until the next scheduled leakage test PROVIDED nondestructive examination is PERFORMED in accordance with site's Repair/Replacement Program.
 - (1) welds of attachments to the surface of the pressure retaining boundary;
 - (2) repair cavities, the depth of which does not penetrate the required DESIGN wall by more than 10 percent;
or
 - (3) welds attaching penetrations that are NPS 1 inch or smaller.
- c) Accessible surface areas (that were repaired or replaced) **SHALL** be visually examined DURING the performance of the pressure test.

- d) If the requirements of Appendix J can **NOT** be satisfied, the source of leakage **SHALL** be located and repaired or replaced and **EXAMINED** to the extent necessary to establish the requirements for corrective actions.
 - (1) Upon completion of the repair/replacement activity, the appropriate Appendix J leakage test **SHALL** be re-performed **PRIOR** to returning the component to service.

8. Repair/Replacement Activities

NOTE: Non-pressure retaining components, items, or portions thereof are excluded from the following requirements.

- a) Repair/replacement activity **SHALL** be **PERFORMED** in accordance with Exelon Procedure ER-AA-330-009.
- b) The repair/replacement activity **SHALL** meet the applicable requirements of IWE-1232 when **ACCESSIBILITY** for visual examination cannot be obtained from the outside surface.
- c) Upon completion of a repair/replacement activity, the following portions of ASME Code Class MC components **SHALL** remain **ACCESSIBLE** for either direct or remote visual examination from at **LEAST ONE SIDE**:
 - (1) opening and penetrations;
 - (2) structural discontinuities;
 - (3) single-welded butt joints from the weld side;
 - (4) surface areas requiring augmented examinations;
 - (5) 80% of the accessible surface area (excluding integral attachments).
- d) When a repair/replacement activity is performed while the plant is in service, the preservice examination may be **DEFERRED** to the next scheduled plant outage, **PROVIDED** the nondestructive examinations specified by the Construction Code and/or Design Specification are **PERFORMED**.

- e) When a repair/replacement activity is performed while the plant is NOT in service, the preservice examination **SHALL** be PERFORMED PRIOR to the resumption of service.
- f) Reapplied coatings **SHALL** be COMPATIBLE with the existing system and performed in accordance with the CPS Protective Coatings Program.

C. REQUIREMENTS FOR ASME CODE CLASS CC COMPONENTS

NOTE: Clinton Power Station does not utilize an unbonded post-tensioning system. For this reason, the rules and requirements associated with this system will NOT be addressed.

This section provides the requirements for classification and inservice inspection of components classified as ASME Code Class CC.

1. Classification of Components

Components or portions thereof that COMPRISE the reinforced concrete pressure resisting shell of a Concrete Primary Containment structure **SHALL** be CLASSIFIED as ASME Code Class CC.

2. Classification Boundary

NOTE: The classification boundary defines the surface areas subject to inservice inspection.

The ASME Code Class CC boundary **SHALL ENCOMPASS** the INACCESSIBLE and ACCESSIBLE surface areas of the reinforced concrete pressure resisting shell.

3. Examination Requirements

- a) Following a repair activity, a preservice examination **SHALL** be PERFORMED and VERIFIED by the ANII.
- b) Preservice or inservice examinations **SHALL** be performed in accordance with a procedure APPROVED by the Responsible Engineer(s) or under the DIRECTION of the Responsible Engineer(s).
- c) Inservice examinations **SHALL** be PERFORMED, as required, to satisfy the extent and frequency outlined for Examination Category L-A (Table IWL-2500-1) and VERIFIED by the ANII.

4. Examination Boundary

The preservice and inservice examination boundary for the concrete shell **SHALL** include the ACCESSIBLE INTERIOR and EXTERIOR surface areas.

5. Inspection Schedule

- a) The completion date of the expedited examination required by §50.55a(g)(6)(ii)(B)(2) [see Final Rule published August 8, 1996, 61 FR 41303]. **SHALL** establish the specified dates for the 5-year subsequent examinations.
- b) The 5-year subsequent examinations **SHALL** commence **NOT** more than 1 year **PRIOR** to the specified date and **SHALL** be completed **NOT** more than 1 year after the specified date.

6. Leakage Tests

- a) Upon completion of a repair, an Appendix J leakage test **SHALL** be **PERFORMED UNLESS** one of the two conditions listed below are met:
 - (1) The approved engineering evaluation **DEMONSTRATED** that the structural integrity of the containment in the existing **UNREPAIRED** condition has **NOT** been reduced below that required by the original **DESIGN** criteria.
 - (2) The repair affects only the cover concrete external to the outermost layer of structural reinforcing steel.
- b) If a leakage test is **REQUIRED**, the leakage test **SHALL** be **PERFORMED** in accordance with a procedure that has been **REVIEWED** and **ACCEPTED** by the Responsible Engineer and at a pressure equal to the design basis accident pressure, P_a .
- c) If the repair is performed while the plant is in service, the leakage test may be **DEFERRED** to the next scheduled integrated leak rate test (ILRT).
- d) If the repair is performed while the plant is **NOT** in service, the leakage test **SHALL** be **PERFORMED PRIOR** to the resumption of service.
- e) Accessible surface areas (that were repaired) **SHALL** be visually examined (Detailed Visual) **PRIOR** to the **START OF**

PRESSURIZATION, AT TEST PRESSURE, AND FOLLOWING COMPLETION OF DEPRESSURIZATION.

- (1) If the above Detailed Visual examination does NOT meet the acceptance standards established by the Responsible Engineer, the corrective measures outlined in IWL-5260 **SHALL** be met.

NOTE: IWL-5300 does not specify a time period for the approval of the Leakage Test Report. As a good practice, the report should be approved within 90 days following test completion.

- f) Following the completion of the leakage test, a Leakage Test Report **SHALL** be **PREPARED** that **INCLUDES** the following information:
 - (1) description of the leakage test procedure;
 - (2) examination results;
 - (3) whether the repair was acceptable; and/or
 - (4) if the first repair was NOT acceptable, the corrective measure taken.
- g) The Leakage Test Report **SHALL** be **APPROVED** by the Responsible Engineer.

7. Repair Activities

- a) Repair activities **SHALL** be **PERFORMED** in accordance with a Repair/Replacement Program that complies with the applicable requirements of IWA-4000.
- b) The repair package (e.g., MWO, R/R Data Sheet, or other approved plant documents) **SHALL** be **APPROVED** by the Responsible Engineer and **INCLUDE** the following information:
 - (1) instructions and/or requirements for the removal of the defective material;
 - (2) a requirement to visually examine the affected area to assure proper surface preparation of concrete and reinforcing steel **PRIOR** to placement of repair material;
 - (3) a requirement to visually examine any reinforcement steel if exposed during the removal process;

- (4) instructions and/or requirements to assure the repair material is chemically, mechanically, and physically compatible with the existing concrete; and/or
 - (5) instructions and/or requirements for in-process sampling and testing of the repair material.
- c) Damaged reinforcing steel **SHALL** be REPAIRED by any method permitted in the original Construction Code or ASME Section III, Division 2, with or without removal of the damaged reinforcement steel.

VIII. CONTAINMENT INSPECTION RELIEF REQUESTS

Attachment C contains an index and relief requests written in accordance with 10CFR50.55a(a)(3) and (g)(5) when specific ASME Section XI requirements for containment inspection are considered impractical or pose an undue burden on Clinton Power Station. The relief requests identified are subject to change during the course of the ten-year inspection interval as a result of changes in technology, plant design or as a result of installed modifications. If examinations or tests are determined to be impractical, or result in hardship or unusual difficulty without commensurate increase in the level of quality or safety, during the course of the interval, additional or modified relief requests will be submitted in accordance with 10CFR50.55a(a)(3) and (g)(5).

Attachment C provides the relief requests and index that summarizes each relief request and provides for sequential numbering to maintain continuity for the remaining containment inspection interval for, Clinton Power Station.

IX

EXAMINATION

CATEGORIES

AND

COMPONENT

APPLICABILITY

Exam Category	Item Number	Description	Applicability to CPS	Exam Method	Total Number of Components	Relief Requests	Remarks
E-A	E1.10	Containment Vessel Pressure Retaining Boundary	Applicable				
	E1.11	Accessible Surface Areas	Applicable	General Visual	226	NONE	Includes portions of MC Liner (above elevation 737', top of suppression pool) -- divided into areas inspection by elevations/quadrants), 152 MC Mechanical Penetrations, and 45 Electrical Penetrations
	E1.11B	Pressure Retaining Bolting	Applicable	VT-3	4	NONE	Includes Equipment Hatch (1MC001); Fuel Transfer Tube (1MC004); Containment Pressurization Line (1MC067); and RT Decontamination Line Flanges (1MC074). Note 1
	E1.12	Accessible Surface Areas-Wetted Surfaces of Submerged Areas	Applicable	Visual, VT-3	13	NONE	Includes portions of one MC Liner (below elevation 737', top of suppression pool) and nine (9) MC Mechanical Penetrations Note 2
	E1.20	Vent System Accessible Surface Areas	Not Applicable	Visual, VT-3	1	NONE	The Vent System is Inaccessible Note 2
	E1.30	Moisture Barriers	Not Applicable	Visual, VT-3	NONE	NONE	Not Applicable
<p>NOTES: 1) VT-3 examination of pressure retaining bolting is a requirement of 10CFR50.55a(b)(2)(ix)(G) and (H). 2) VT-3 examination of Item No. E1.12 and Item No. E1.20 components is a requirement of 10CFR50.55a(b)(2)(ix)(G)</p>							

<u>Exam Category</u>	<u>Item Number</u>	<u>Description</u>	<u>Applicability to CPS</u>	<u>Exam Method</u>	<u>Total Number of Components</u>	<u>Relief Requests</u>	<u>Remarks</u>
E-C	E4.10	Containment Surface Areas					Notes 1, 2, 3 and 4
	E4.11	Visible Surfaces	Applicable	Visual, VT-1	NONE	NONE	Note 5
	E4.12	Surface Area Grid, Minimum Wall Thickness Location	Applicable	Volumetric	NONE	NONE	Notes 1, 2, 3, and 4

NOTES:

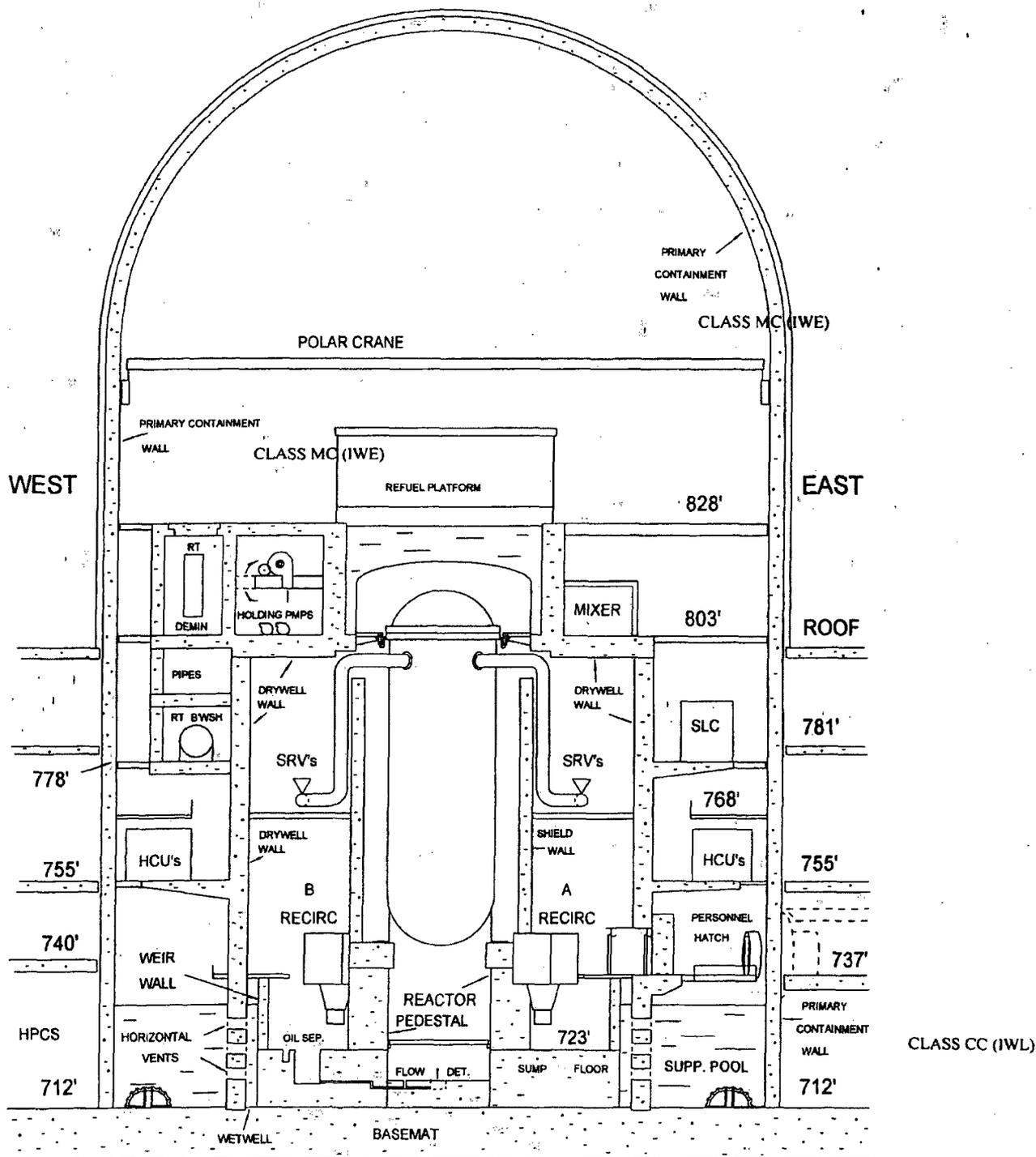
- (1) Containment surface areas requiring augmented examination are those identified in IWE-1240.
- (2) The extent of examination shall be 100% for each inspection period until the areas examined remain essentially unchanged duringr the next inspection period. Such areas no longer require augmented examination in accordance with IWE-2420(c).
- (3) Deferral of inspection to the end of the interval is not permissible.
- (4) Engineering Evaluation, Number 00-058, dated 6/13/00, and the following coatings inspection letters determined that augmented examinations were not required.
 - 2000 (C1R07) – letters Y-109296, dated 12/6/200 and Y-109301, dated 12/19/2000, do not require any augmented examinations.
 - 2002 (C1R08) – letter Y-109409, and Y109410, both dated 5/1/2002, do not require any augmented examinations.
 - 2004 (C1R09) – letter Y-109444 and Y-109445, both dated 2/9/2004, do not require any augmented examinations.
 - 2006 (C1R10) – letter Y-109522 and Y-109523, both dated 2/9/2006, do not require any augmented examinations.
 - 2008 (C1R11) – letter Y-109565 dated 1/20/2008, do not require any augmented examinations.
- (5) VT-1 examination is a requirement of 10CFR50.55a(b)(2)(ix)(G)

Exam Category	Item Number	Description	Applicability to CPS	Exam Method	Total Number of Components	Relief Requests	Remarks
L-A	L1.10	Concrete Surface					External to containment. Area outside underneath Gas Control Boundary above 860 elevation is inaccessible due to curvature of the Dome.
	L1.11	All Areas	Applicable	General Visual	9	NONE	
	L1.12	Suspect Areas	Applicable	Detailed Visual	NONE	NONE	No suspect areas have been identified. Engineering Evaluation, Number 00-058, dated 6/13/00 does not require any additional examinations.

<u>Exam Category</u>	<u>Item Number</u>	<u>Description</u>	<u>Applicability to CPS</u>	<u>Exam Method</u>	<u>Total Number of Components</u>	<u>Relief Requests</u>	<u>Remarks</u>
L-B	L2.10	Tendon	Not Applicable	IWL-2522	Not Applicable	NONE	Not Applicable
	L2.20	Wire or Strand	Not Applicable	IWL-2523-2	Not Applicable	NONE	Not Applicable
	L2.30	Anchorage Hardware and Surrounding Concrete	Not Applicable	Detailed Visual	Not Applicable	NONE	Not Applicable
	L2.40	Corrosion Protection Medium	Not Applicable	IWL-2525.2(a)	Not Applicable	NONE	Not Applicable
	L2.50	Free Water	Not Applicable	IWL-2525.2(b)	Not Applicable	NONE	Not Applicable

X

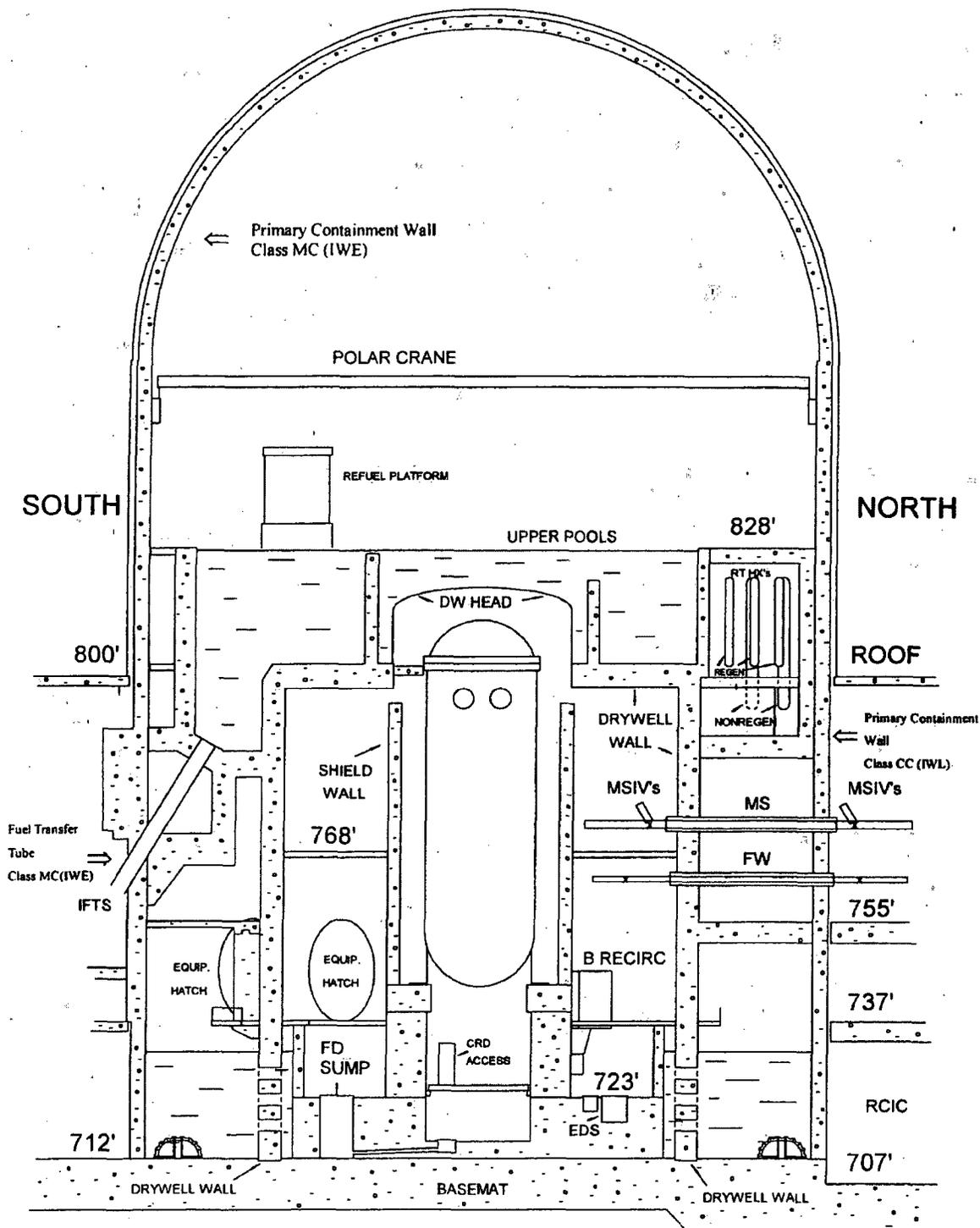
**CONTAINMENT
AND
BOUNDARY FIGURES**



Primary Containment East-West Vertical Cross-Section

Looking toward the Turbine Building

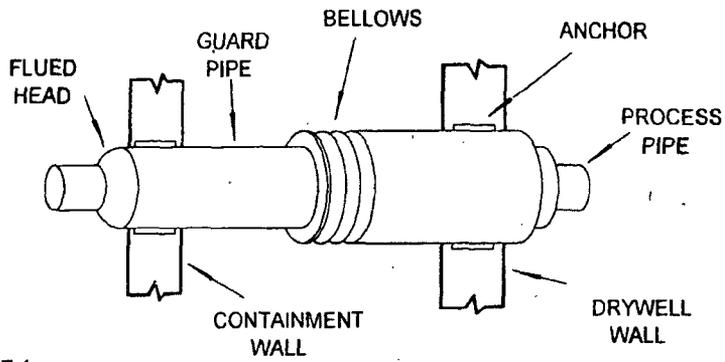
(Note: Drywell and Shield wall are not Class CC/IWL)



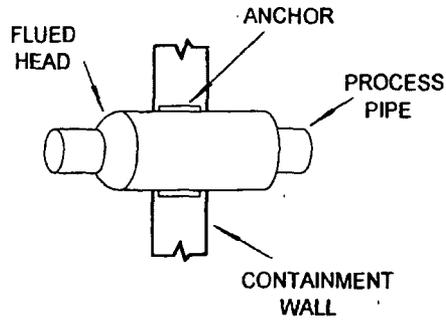
Primary Containment North-South Vertical Cross-Section

Fuel Building on the left, Aux Building on the right.

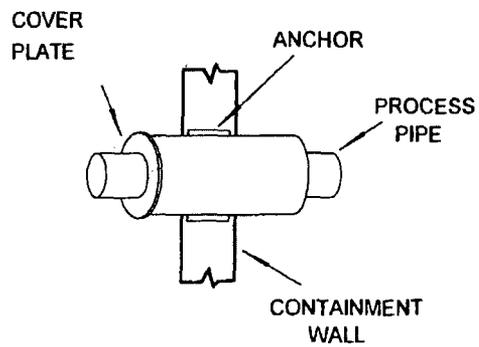
(Note: Drywell and Shield wall are not Class CC/IWL)



TYPE 1



TYPE 2

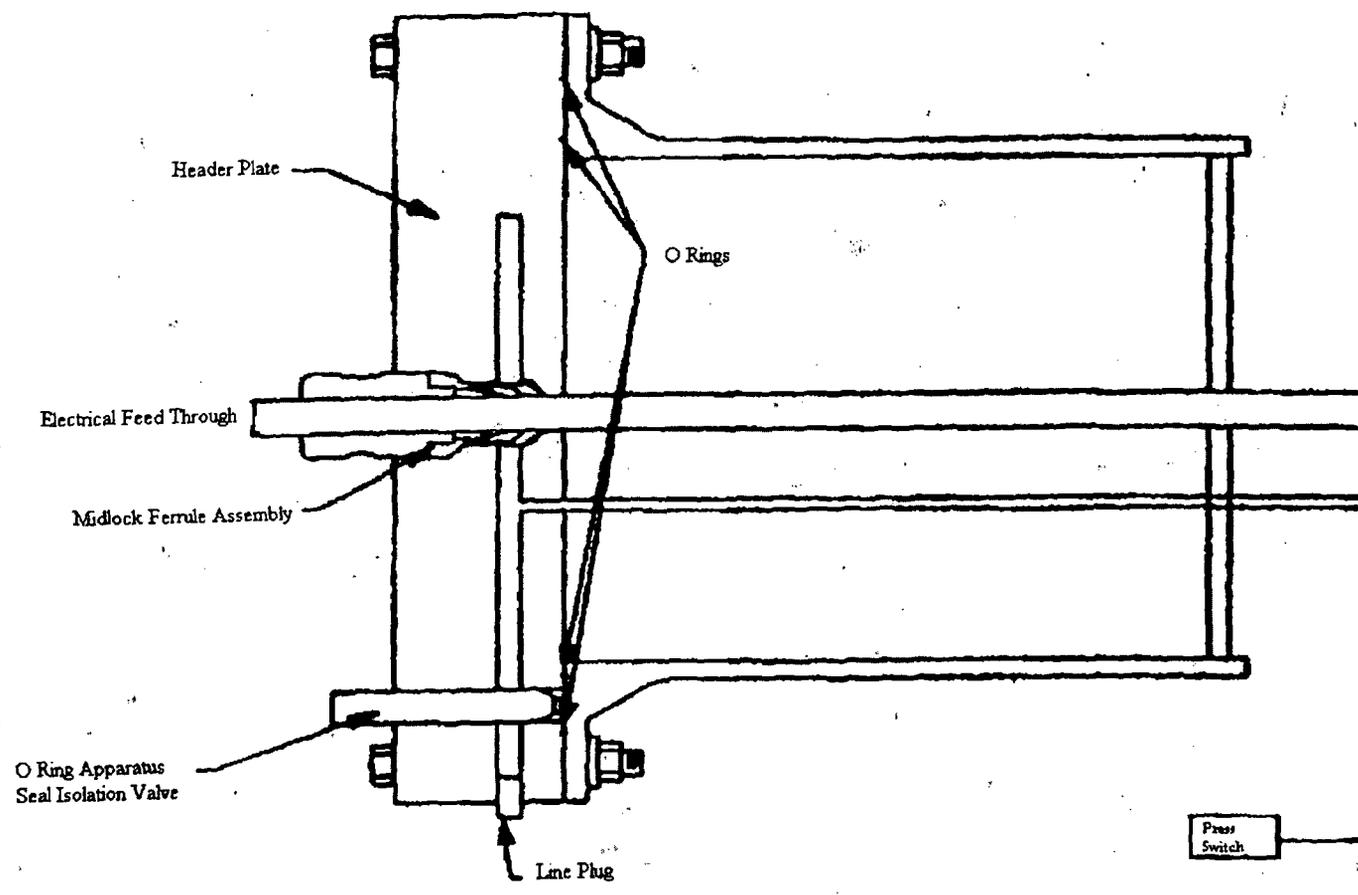


TYPE 3

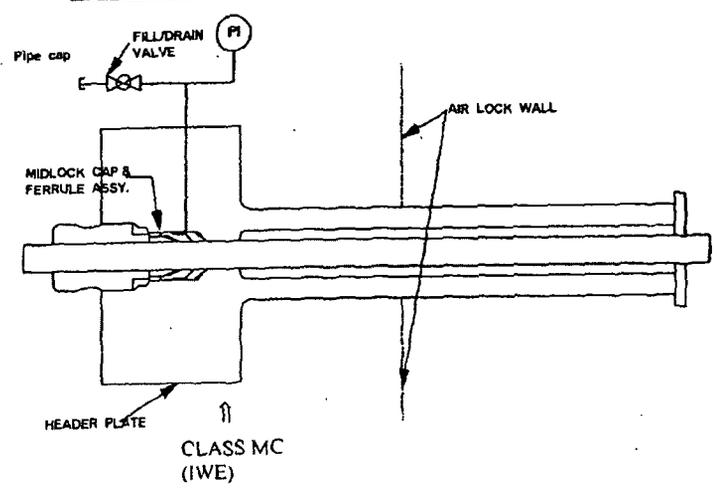
See applicable design drawings for Class MC boundaries and process pipe code class

Piping Penetrations

PENETRATIONS 1EE01E through 1EE45E



PENETRATIONS 1EE46E through 1EE49E



XI

ATTACHMENTS

ATTACHMENT A

LIST OF APPLICABLE DRAWINGS, DIAGRAMS AND SPECIFICATIONS

<u>Drawing Number</u>	<u>Title of Drawing/Diagram/Specification</u>
S27-1905, Sht. 1	Containment Liner Internal Face
S27-1906, Sht. 2	Containment Liner Internal Face
S27-1907, Sht. 3	Containment Liner Internal Face
S27-1908, Sht. 4	Containment Liner Internal Face
S27-1403, Sht. 1	Containment Exterior Face
S27-1404, Sht. 2	Containment Exterior Face
M03-1101, Sheets 1, 2, & 3	Mechanical Penetrations Containment
M06-1000 Sheets 1-8	Head Fitting and Guard Pipe Details
E27-1310	Electrical Penetrations Containment
K2816	Steel Liner Work for Reactor Containment Structures
K2944	Concrete and Grout Work
K2882	Piping Design
K2978	Electrical Penetrations
K2801-0150 Vol II Part 3	Inclined Fuel Transfer Table
K2816-0001 Tab 2	Equipment Hatch
K2816-0001 Tab 1	Personnel Airlocks
K2978-0001	Electrical Penetrations
DS-ME-09	Mechanical Penetrations Design
DS-ME-09-CP	Design Specification for Piping Penetration Assemblies
DS-SD-03-CP	Containment Structure Design Criteria

ATTACHMENT B

LIST OF ADMINISTRATIVE PROCEDURES

<u>Procedure Number</u>	<u>Procedure Title</u>
ER-AA-1100	Implementing and Managing Engineering Programs
ER-AA-330	Conduct of Inservice Inspection Activities
ER-AA-330-005	Visual Examination of Section XI Class CC Concrete Containment Structures
ER-AA-330-007	Visual Examination of Section XI Class MC Surfaces and Class CC Liners
ER-AA-335-018	Detailed, General, VT-1, VT-1C, VT-3 AND VT-3C, Visual Examination of ASME Class MC and CC Containment Surfaces and Components

ATTACHMENT C

**CONTAINMENT INSPECTION PROGRAM
RELIEF REQUEST INDEX**

Relief Request #	Description	Date* Submitted	Date * Approved	Remarks
NONE	N/A	N/A	N/A	N/A