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Exelon Nuclear

10 CFR 50.55a

February 14, 2006

LTR: BYRON 2006-0027
File: 1.10.0101

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. 50-454 and 50-455

Subject: Byron Station, Units 1 and 2, Transmittal of Inservice Inspection Program Plan for the Third Ten year Inspection Interval

Enclosed is the Byron Station, Units 1 and 2 third ten-year inspection interval Inservice Inspection Program. The enclosed plan replaces the second ten-year inspection interval plan in its entirety. The third interval began January 16, 2006 and will end January 15, 2016.

Section 8 of the enclosed plan contains the third interval proposed alternatives to the American Society of Mechanical Engineers Code, Section XI "Rules for Inspection and Testing of Components of Light Water Cooled Plants" (ASME Code) 2001 Edition through 2003 Addenda. In accordance with 10 CFR 50.55a, "Codes and standards," paragraph 10 CFR 50.55a(a)(3)(i), Exelon Generating Company, LLC (EGC), is requesting approval of these third interval proposed alternatives to the ASME OM Code.

EGC requests approval of these proposed alternatives prior to our Fall 2006 refuel outage for Unit 1 which is scheduled to begin September 11, 2006. Should you have any questions concerning this matter, please contact Mr. William Grundmann, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

David M. Hoots
Plant Manager
Byron Nuclear Generating Station

Attachment - Byron Station, Units 1 and 2 Inservice Inspection Program Plan for the Third Ten year Inspection Interval

ATTACHMENT
Byron Station, Units 1 and 2
Inservice Inspection Program Plan for the Third Ten year Inspection Interval

Exelon Nuclear

ISI PROGRAM PLAN
THIRD TEN-YEAR INSPECTION INTERVAL

Commercial Service Dates:

Unit 1 – 09/16/85

Unit 2 – 08/22/87

Byron Nuclear Power Station
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ALION
SCIENCE AND TECHNOLOGY

REVISION CONTROL SHEET

TITLE: ISI Program Plan REVISION: 0

Major changes should be outlined within the table below. Minor editorial and formatting revisions are not required to be logged.

REVISION	DATE	REVISION SUMMARY
0	9/12/05	Initial issuance. This ISI Program Plan was prepared by Alion Science and Technology Corporation to support Byron Station's Third Inservice Inspection Interval and Second Containment Inservice Inspection Interval. Prepared: S. Coleman Reviewed: T. Hadaway Approved: D. Lamond

Notes:

1. This ISI Program Plan (Sections 1 - 9 inclusive) is controlled by the Byron Nuclear Power Station Engineering Programs Group.
2. Revision 0 of this document was issued as the Third Interval ISI Program Plan and was submitted to the NRC for review, including approval of the initial Third Interval Relief Requests. Future revisions of this document made within the Third Interval will be maintained and controlled at the station; however, they are not required to be and will not be submitted to the NRC for approval. The exception to this is that new or revised Relief Requests shall be submitted to the NRC for safety evaluation and approval.

REVISION SUMMARY

SECTION	EFFECTIVE PAGES	REVISION	DATE
Preface	i to iii	0	9/12/05
1.0	1-1 to 1-18	0	9/12/05
2.0	2-1 to 2-39	0	9/12/05
3.0	3-1 to 3-2	0	9/12/05
4.0	4-1 to 4-2	0	9/12/05
5.0	5-1	0	9/12/05
6.0	6-1 to 6-2	0	9/12/05
7.0	7-1 to 7-40	0	9/12/05
8.0	8-1 to 8-3	0	9/12/05
9.0	9-1 to 9-3	0	9/12/05

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1.0 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This Inservice Inspection (ISI) Program Plan details the requirements for the examination and testing of ISI Class 1, 2, 3, MC, and CC pressure retaining components, supports, and containment structures at Byron Nuclear Power Station (Byron Station), Units 1 and 2. Unit 0 (Common) components are included in the Unit 1 sections, reports, and tables. This ISI Program Plan also includes Containment Inservice Inspection (CISI), Risk-Informed Inservice Inspection (RISI), augmented inservice inspections, and pressure testing requirements imposed on or committed to by Byron Station. At Byron Station, the Inservice Testing (IST) Program is maintained and implemented separately from the ISI Program. The IST Basis Document and Program Plan contain all applicable inservice testing requirements.

The Steam Generator Inservice Inspection Plan is not included in this document except for applicable Code Cases and relief requests. A program addressing inspection requirements is maintained in separate documents and procedures. Eddy current examination of steam generator tubing is controlled and maintained under Byron Station Technical Specifications.

The ASME Section XI Repair/Replacement Program is not included in this document except for referenced Code Cases and relief requests. The program addressing code and regulatory requirements are maintained in separate documents and procedures.

The Byron Station FAC Program is not included in this document except for referenced Code Cases and relief requests. The program addressing code and regulatory requirements are maintained in separate documents and procedures.

The Byron Station Turbine Disk and Rotor Integrity Program is not included in this document except for minor references. The program addressing regulatory requirements are maintained in separate documents and procedures.

The Third ISI Interval is effective from January 16, 2006 through January 15, 2016 for both Byron Station Units 1 and 2. This represents updating the Unit 2 program approximately one and one-half years early as proposed by Relief Request I3R-01. With the update to the ISI Program for the Third Inspection Interval for Class 1, 2, and 3 components, including their supports, Exelon Generation Company, LLC (Exelon) has also elected to update the CISI Program to its Second Interval for Class MC and CC components at the same time (Relief Request I3R-01). This update will enable all of the ISI Program components/ elements to be based on the same effective Edition and Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI as well as share a common interval start and end date. The common ASME Code of Record for the

Third ISI Interval and the Second CISI Interval is the 2001 Edition through the 2003 Addenda.

Paragraph IWA-2430(d)(1) of ASME Section XI allows an inspection interval to be extended or decreased by as much as one year, and Paragraph IWA-2430(e) allows an inspection interval to be extended when a unit is out of service continuously for six months or more. The extension may be taken for a period of time not to exceed the duration of the outage. See Tables 1.1-1, 1.1-2, and 1.1-3 for intervals, periods, and extensions that apply to Byron Station's Third ISI Interval and Second CISI Interval.

The Third ISI Interval and the Second CISI Interval are divided into two or three inspection periods as determined by calendar years within the intervals. Tables 1.1-1, 1.1-2, and 1.1-3 identify the period dates for the Third ISI Interval and the Second CISI Interval as defined by Inspection Program B. In accordance with Paragraph IWA-2430(d)(3), the inspection periods specified in these Tables may be decreased or extended by as much as 1 year to enable inspection to coincide with Byron Station's refueling outages.

Table 1.1-1

Byron Station Unit 1 and Unit 2 ISI Interval/Period/Outage Matrix
(for ISI Class 1, 2, and 3 component examinations)

Unit 1		Period	Interval	Period	Unit 2	
Outage Number	**Projected Outage Start Date or Outage Duration**	**Start Date to End Date**	**Start Date to End Date**	**Start Date to End Date**	**Projected Outage Start Date or Outage Duration**	**Outage Number**
B1R14 (3-1-1)	Fall 2006 (Start 3rd Int)	1st 1/16/06 to 1/15/09	3rd (Unit 1) 1/16/06 to 1/15/16[1] 3rd (Unit 2) 1/16/06 to 1/15/16[1]	1st 1/16/06 to 1/15/09	Spring 2007 (Start 3rd Int)	B2R13 (3-1-1)
B1R15 (3-1-2)	Spring 2008				Fall 2008	B2R14 (3-1-2)
B1R16 (3-2-1)	Fall 2009	2nd 1/16/09 to 1/15/12[2]		2nd 1/16/09 to 1/15/12[2]	Spring 2010	B2R15 (3-2-1)
B1R17 (3-2-2)	Spring 2011				Fall 2011	B2R16 (3-2-2)
B1R18 (3-3-1)	Fall 2012	3rd 1/16/12 to 1/15/16[2]		3rd 1/16/12 to 1/15/16[2]	Spring 2013	B2R17 (3-3-1)
B1R19 (3-3-2)	Spring 2014 (End 3rd Int)				Fall 2014 (End 3rd Int)	B2R18 (3-3-2)

Note 1: A request to share a common interval start and end date between Byron Station Units 1 and 2 was submitted in accordance with Relief Request I3R-01.

Note 2: The Byron Station Units 1 and 2 Second Period was reduced by one year and the Third Period was extended by one year as permitted by IWA-2430(d)(3) in order to coincide with the plant refueling outage schedule.

Table 1.1-2

Byron Station Unit 1 and Unit 2 ISI Interval/Period/Outage Matrix
(for ISI Class MC component examinations)

Unit 1		Period	Interval	Period	Unit 2	
Outage Number	**Projected Outage Start Date or Outage Duration**	**Start Date to End Date**	**Start Date to End Date**	**Start Date to End Date**	**Projected Outage Start Date or Outage Duration**	**Outage Number**
B1R14 (2-1-1)	Fall 2006 (Start 2nd Int)	1st 1/16/06 to 1/15/09	2nd (Unit 1) 1/16/06 to 1/15/16[1] 2nd (Unit 2) 1/16/06 to 1/15/16[1]	1st 1/16/06 to 1/15/09	Spring 2007 (Start 2nd Int)	B2R13 (2-1-1)
B1R15 (2-1-2)	Spring 2008				Fall 2008	B2R14 (2-1-2)
B1R16 (2-2-1)	Fall 2009	2nd 1/16/09 to 1/15/12[2]		2nd 1/16/09 to 1/15/12[2]	Spring 2010	B2R15 (2-2-1)
B1R17 (2-2-2)	Spring 2011				Fall 2011	B2R16 (2-2-2)
B1R18 (2-3-1)	Fall 2012	3rd 1/16/12 to 1/15/16[2]		3rd 1/16/12 to 1/15/16[2]	Spring 2013	B2R17 (2-3-1)
B1R19 (2-3-2)	Spring 2014 (End 2nd Int)				Fall 2014 (End 2nd Int)	B2R18 (2-3-2)

Note 1: A request for use of subsequent ASME Section XI Code Edition and Addenda was submitted in accordance with Relief Request I3R-01 which implements the 2001 Edition through the 2003 Addenda of ASME Section XI for the CISI Programs as well as to share a common interval start and end date with the ISI Program.

Note 2: The Byron Station Units 1 and 2 Second Period was reduced by one year and the Third Period was extended by one year as permitted by IWA-2430(d)(3) in order to coincide with the plant refueling outage schedule.

Table 1.1-3

Byron Station Unit 1 and Unit 2 ISI Interval/Period/Outage Matrix
(for ISI Class CC component examinations)

Unit 1		Period	Interval	Period	Unit 2	
Outage Number	**Projected Outage Start Date or Outage Duration**	**Start Date to End Date**	**Start Date to End Date**	**Start Date to End Date**	**Projected Outage Start Date or Outage Duration**	**Outage Number**
B1R14 (2-1-1)	Fall 2006 (Start 2nd Int)	1st 1/16/06 to 1/15/11	2nd (Unit 1) 1/16/06 to 1/15/16[1] 2nd (Unit 2) 1/16/06 to 1/15/16[1]	1st 1/16/06 to 1/15/11	Spring 2007 (Start 2nd Int)	B2R13 (2-1-1)
B1R15 (2-1-2)	Spring 2008				Fall 2008	B2R14 (2-1-2)
B1R16 (2-1-3)	Fall 2009				Spring 2010	B2R15 (2-1-3)
B1R17 (2-2-1)	Spring 2011	2nd 1/16/11 to 1/15/16		2nd 1/16/11 to 1/15/16	Fall 2011	B2R16 (2-2-1)
B1R18 (2-2-2)	Fall 2012				Spring 2013	B2R17 (2-2-2)
B1R19 (2-2-3)	Spring 2014 (End 2nd Int)				Fall 2014 (End 2nd Int)	B2R18 (2-2-3)

Note 1: A request for use of subsequent ASME Section XI Code Edition and Addenda was submitted in accordance with Relief Request I3R-01 which implements the 2001 Edition through the 2003 Addenda of ASME Section XI for the CISI Programs as well as to share a common interval start and end date with the ISI Program.

1.2 BACKGROUND

The Commonwealth Edison Company, now known commercially as Exelon Generation Company or Exelon, obtained Construction Permits to build Byron Station Units 1 and 2 on December 31, 1975, for Unit 1, CPPR-130, and for Unit 2, CPPR-131. The Docket Numbers assigned to Byron Station are 50-454 for Unit 1 and 50-455 for Unit 2. After satisfactory plant construction and pre-operational testing was completed, Exelon was granted a full-power operating license for Unit 1, NPF-37, and subsequently commenced commercial operation on September 16, 1985; the full-power operating license for Unit 2, NPF-66, was granted and commercial operation commenced on August 22, 1987.

Byron Station's piping systems and associated components were designed and fabricated to the examination requirements of ASME Section XI. Although this plant was specifically designed to meet the requirements of ASME Section XI, literal compliance may not be feasible or practical within the limits of the current plant design. Certain limitations are likely to occur due to conditions such as accessibility, geometric configuration, and/or metallurgical characteristics. For some inspection categories, an alternate component may be selected for examination and the code statistical and distribution requirements can still be maintained. If Code required examination selection criteria cannot be met, a relief request will be submitted in accordance with 10 CFR 50.55a.

1.3 SECOND INTERVAL ISI PROGRAM

Pursuant to the Code Of Federal Regulations, Title 10, Part 50, Section 55a, *Codes and standards*, (10 CFR 50.55a), Paragraph (g), *Inservice inspection requirements*, licensees were required to update their ISI Programs to meet the requirements of ASME Section XI once every ten years or inspection interval. The ISI Program was required to comply with the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a twelve (12) months prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii).

The Byron Station Second Interval ISI Program Plan was initially developed in accordance with the requirements of 10 CFR 50.55a including all published changes through June 30, 1995 and September 15, 1997 for Units 1 and 2 respectively, and the 1989 Edition, No Addenda of ASME Section XI. This ISI Program Plan addressed Subsections IWA, IWB, IWC, IWD, IWF, and Mandatory Appendices of ASME Section XI, approved ASME Code Cases, approved alternatives through relief requests and Safety Evaluation Reports (SERs), and utilized Inspection Program B as defined therein.

As an alternative to the full ten-year interval duration requirements of IWA-2430(b) and (d) and IWA-2432 for the Unit 2 Second ISI Interval and for the Units 1 and 2 First CISI Intervals, Byron Station has proposed Relief Request I3R-01 to modify the interval dates of the Unit 2 Second ISI Interval and of the Units 1 and 2 First CISI Intervals. This will permit the subsequent ISI and CISI Programs to share a common inspection interval and to implement common code editions for Class 1, 2, 3, MC,

and CC components. As such, the Second Inservice Inspection Interval was effective from June 30, 1996 through January 15, 2006 for Byron Station Unit 1 and effective from August 16, 1998 through January 15, 2006 for Byron Station Unit 2.

Augmented ISI of Byron Station Unit 1 Reactor Vessel shell welds as mandated by 10 CFR 50.55a(g)(6)(ii)(A), was completed during the last period of First Ten-Year Inspection Interval. Volumetric examination of greater than 90% of the weld volume was completed, except as detailed in Relief Request NR-20 of the First Ten-Year Interval ISI Program Plan.

Augmented ISI of Byron Station Unit 2 Reactor Vessel shell welds as mandated by 10 CFR 50.55a(g)(6)(ii)(A), was completed during the last period of First Ten-Year Inspection Interval. Volumetric examination of greater than 90% of the weld volume was completed, except as detailed in Relief Request NR-27 of the First Ten-Year Interval ISI Program Plan.

1.4 THIRD INTERVAL ISI PROGRAM

Per 10 CFR 50.55a(g), licensees are required to update their ISI Programs to meet the requirements of ASME Section XI once every ten years or inspection interval. The ISI Program is required to comply with the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a twelve (12) months prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii). As discussed in Section 1.3.1 above, the start of the Third ISI Interval will be on January 16, 2006 for Byron Station Units 1 and 2. Based on this date, the latest edition and addenda of the Code referenced in 10 CFR 50.55a(b)(2) twelve months prior was the 2001 Edition through the 2003 Addenda.

The Byron Station Third Interval ISI Program Plan was developed in accordance with the requirements of 10 CFR 50.55a including all published changes through November 1, 2004 for Units 1 and 2 respectively, and the 2001 Edition through the 2003 Addenda of ASME Section XI, subject to the limitations and modifications contained within Paragraph (b) of the regulation. The limitations and modifications are detailed in Table 1.7-1 of this section. This ISI Program Plan addresses Subsections IWA, IWB, IWC, IWD, IWF, Mandatory Appendices of ASME Section XI, approved ASME Code Cases, approved alternatives through relief requests and SERs, and utilizes Inspection Program B as defined therein.

Byron Station has adopted the EPRI Topical Report TR-112657, Rev. B-A methodology, which is supplemented by Code Case N-578-1, for implementing risk-informed inservice inspections under Relief Request I3R-02. The RISI Program will be in effect for the entire Third Inspection Interval. This approach replaces the categorization, selection, and examination volume requirements of ASME Section XI Categories B-F, B-J, C-F-1, and C-F-2 applicable to Byron Station with Category R-A as defined in Code Case N-578-1.

Byron Station has also adopted the EPRI Topical Report TR-1006937, Rev. 0-A, methodology for additional guidance for adaptation of the RISI evaluation process to

Break Exclusion Region (BER) piping, also referred to as the High Energy Line Break (HELB) region. This change to the BER program is made under 10 CFR 50.59 evaluation criteria. The BER program will be in effect for the entire Third Inspection Interval.

1.5 First Interval CISI Program

CISI examinations were originally invoked by amended regulations contained within a Final Rule issued by the Nuclear Regulatory Commission (NRC). The amended regulation incorporated the requirements of the 1992 Edition with the 1992 Addenda of the ASME Section XI, Subsections IWE and IWL, subject to specific modifications that were included in Paragraphs 10 CFR 50.55a(b)(2)(ix) and 10 CFR 50.55a(b)(2)(x). Relief from the examination requirements of Subsections IWE and IWL of the 1992 Edition through the 1992 Addenda of ASME Section XI was granted by the NRC to allow Byron Station to use the 1998 Edition of Subsections IWE and IWL of ASME Section XI for inspection of containment components.

The final rulemaking was published in the Federal Register on August 8, 1996 and specified an effective date of September 9, 1996. Implementation of the Subsection IWE and IWL Program from a scheduling standpoint was driven by the five year expedited implementation period per 10 CFR 50.55a(g)(6)(ii)(B), which specified that the examinations required to be completed by the end of the First Period of the First Inspection Interval (per Table IWE-2412-1) be completed by the effective date (by September 9, 2001).

ASME Section XI Subsections IWE, IWL, Mandatory Appendices, approved ASME Code Cases, and approved alternatives through relief requests and SER's were added to the ISI Program midway through the Second Inspection Interval to address CISI. The CISI Program Plan was developed and implemented prior to the required date, and examinations for the first and second periods were performed in accordance with the First Inspection Interval schedule.

As an alternative to the full ten-year interval duration requirements of IWA-2430(b) and (d) and IWA-2432 for the Unit 2 Second ISI Interval and for the Units 1 and 2 First CISI Intervals, Byron Station has proposed Relief Request I3R-01 to modify the interval dates of the Unit 2 Second ISI Interval and of the Units 1 and 2 First CISI Intervals. This will permit the subsequent ISI and CISI Programs to share a common inspection interval and to implement common code editions for Class 1, 2, 3, MC, and CC components. As such, the First CISI Interval occurred approximately three years early and was effective from September 9, 1996 through January 15, 2006 for Byron Station Units 1 and 2.

1.6 Second Interval CISI Program

Per 10 CFR 50.55a(g), licensees are required to update their CISI Programs to meet the requirements of ASME Section XI once every ten years or inspection interval. The CISI Program is required to comply with the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a twelve (12) months prior to the

start of the interval per 10 CFR 50.55a(g)(4)(ii). As discussed in Section 1.5 above, the start of the Second CISI Interval will be on January 16, 2006 for Byron Station Units 1 and 2. Based on this date, the latest edition and addenda of the Code referenced in 10 CFR 50.55a(b)(2) twelve months prior was the 2001 Edition through the 2003 Addenda.

The Byron Station Second Interval CISI Program Plan was developed in accordance with the requirements of 10 CFR 50.55a including all published changes through November 1, 2004, and the 2001 Edition through the 2003 Addenda of ASME Section XI, subject to the limitations and modifications contained within Paragraph (b) of the regulation. The limitations and modifications are detailed in Table 1.7-1 of this section.

This CISI Program Plan addresses Subsections IWE, IWL, Mandatory Appendices, approved ASME Code Cases, approved alternatives through relief requests and SER's, and utilizes Inspection Program B as defined therein.

1.7 Code of Federal Regulations 10 CFR 50.55a Requirements

There are certain Paragraphs in 10 CFR 50.55a that list the limitations, modifications, and/or clarifications to the implementation requirements of ASME Section XI. These Paragraphs in 10 CFR 50.55a, including all published changes through November 1, 2004, that are applicable to Byron Station are detailed in Table 1.7-1.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 1 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(viii)(E)	**(CISI)** *Examination of concrete containments:* For Class CC applications, the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. For each inaccessible area identified, the licensee shall provide the following in the ISI Summary Report required by IWA-6000: (*1*) A description of the type and estimated extent of degradation, and the conditions that led to the degradation; (*2*) An evaluation of each area, and the result of the evaluation, and; (*3*) A description of necessary corrective actions.
10 CFR 50.55a(b)(2)(viii)(F)	**(CISI)** *Examination of concrete containments:* Personnel that examine containment concrete surfaces and tendon hardware, wires, or strands must meet the qualification provisions in IWA-2300. The "owner-defined" personnel qualification provisions in IWL-2310(d) are not approved for use.
10 CFR 50.55a(b)(2)(viii)(G)	**(CISI)** *Examination of concrete containments:* Corrosion protection material must be restored following concrete containment post-tensioning system repair and replacement activities in accordance with the quality assurance program requirements specified in IWA-1400.
10 CFR 50.55a(b)(2)(ix)(A)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* For Class MC applications, the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. For each inaccessible area identified, the licensee shall provide the following in the ISI Summary Report as required by IWA-6000: (*1*) A description of the type and estimated extent of degradation, and the conditions that led to the degradation; (*2*) An evaluation of each area, and the result of the evaluation, and; (*3*) A description of necessary corrective actions.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 2 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(ix)(B)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* When performing remotely the visual examinations required by Subsection IWE, the maximum direct examination distance specified in Table IWA-2210-1 may be extended and the minimum illumination requirements specified in Table IWA-2210-1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination.
10 CFR 50.55a(b)(2)(ix)(F)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* VT-1 and VT-3 examinations must be conducted in accordance with IWA-2200. Personnel conducting examinations in accordance with the VT-1 or VT-3 examination method shall be qualified in accordance with IWA-2300. The "owner-defined" personnel qualification provisions in IWE-2330(a) for personnel that conduct VT-1 and VT-3 examinations are not approved for use.
10 CFR 50.55a(b)(2)(ix)(G)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* The VT-1 examination method must be used to conduct the examination in Item E4.11 of Table IWE-2500-1. An examination of the pressure-retaining bolted connections in Item E1.11 of Table IWE-2500-1 using the VT-3 examination method must be conducted once each interval. The "owner-defined" visual examination provisions in IWE-2310(a) are not approved for use for VT-1 and VT-3 examinations.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 3 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(ix)(H)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* Containment bolted connections that are disassembled during the scheduled performance of the examinations in Item E1.11 of Table IWE-2500-1 must be examined using the VT-3 examination method. Flaws or degradation identified during the performance of a VT-3 examination must be examined in accordance with the VT-1 examination method. The criteria in the material specification or IWB-3517.1 must be used to evaluate containment bolting flaws or degradation. As an alternative to performing VT-3 examinations of containment bolted connections that are disassembled during the scheduled performance of Item E1.11, VT-3 examinations of containment bolted connections may be conducted whenever containment bolted connections are disassembled for any reason.
10 CFR 50.55a(b)(2)(ix)(I)	**(CISI)** *Examination of metal containments and the liners of concrete containments:* The ultrasonic examination acceptance standard specified in IWE-3511.3 for Class MC pressure-retaining components must also be applied to metallic liners of Class CC pressure-retaining components.
10 CFR 50.55a(b)(2)(xi)	**(ISI)** *Class 1 piping:* Licensees may not apply IWB-1220, "Components Exempt from Examination," of Section XI, 1989 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, and shall apply IWB-1220, 1989 Edition.
10 CFR 50.55a(b)(2)(xii)	**(ISI)** *Underwater Welding:* The provisions in IWA-4660, "Underwater Welding," of Section XI, 1997 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, are not approved for use on irradiated material.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 4 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xviii)(A)	**(ISI)** *Certification of NDE personnel:* Level I and II nondestructive examination personnel shall be recertified on a 3-year interval in lieu of the 5-year interval specified in the 1997 Addenda and 1998 Edition of IWA-2314, and IWA-2314(a) and IWA-2314(b) of the 1999 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.
10 CFR 50.55a(b)(2)(xviii)(B)	**(ISI)** *Certification of NDE personnel:* Paragraph IWA-2316 of the 1998 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, may only be used to qualify personnel that observe for leakage during system leakage and hydrostatic tests conducted in accordance with IWA-5211(a) and (b), 1998 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.
10 CFR 50.55a(b)(2)(xviii)(C)	**(ISI)** *Certification of NDE personnel:* When qualifying visual examination personnel for VT-3 visual examinations under Paragraph IWA-2317 of the 1998 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, the proficiency of the training must be demonstrated by administering an initial qualification examination and administering subsequent examinations on a 3-year interval.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 5 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xix)	**(ISI)** *Substitution of alternative methods:* The provisions for the substitution of alternative examination methods, a combination of methods, or newly developed techniques in the 1997 Addenda of IWA-2240 must be applied. The provisions in IWA-2240, 1998 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, are not approved for use. The provisions in IWA-4520(c), 1997 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, allowing the substitution of alternative examination methods, a combination of methods, or newly developed techniques for the methods specified in the Construction Code are not approved for use.
10 CFR 50.55a(b)(2)(xxi)(A)	**(ISI)** *Table IWB-2500-1 examination requirements:* The provisions of Table IWB-2500-1, Examination Category B-D, Full Penetration Welded Nozzles in Vessels, Items B3.120 and B3.140 (Inspection Program B) in the 1998 Edition must be applied when using the 1999 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section. A visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria in Table IWB-3512-1, 1997 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, may be performed in place of an ultrasonic examination.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 6 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xxi)(C)	**(ISI)** *Table IWB-2500-1 examination requirements:* The provisions of Table IWB-2500-1, Examination Category B-K, Item B10.10, of the 1995 Addenda must be applied when using the 1997 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.
10 CFR 50.55a(b)(2)(xxii)	**(ISI)** *Surface Examination:* The use of the provision in IWA-2220, "Surface Examination," of Section XI, 2001 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, that allow use of an ultrasonic examination method is prohibited.
10 CFR 50.55a(b)(2)(xxiii)	**(ISI)** *Evaluation of Thermally Cut Surfaces:* The use of the provisions for eliminating mechanical processing of thermally cut surfaces in IWA-4461.4.2 of Section XI, 2001 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section are prohibited.
10 CFR 50.55a(b)(2)(xxiv)	**(PDI)** *Incorporation of the Performance Demonstration Initiative and Addition of Ultrasonic Examination Criteria:* The use of Appendix VIII and the supplements to Appendix VIII and Article I-3000 of Section XI of the ASME BPV Code, 2002 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section, is prohibited.
10 CFR 50.55a(b)(2)(xxv)	**(ISI)** *Mitigation of Defects by Modification:* The use of the provisions in IWA-4340, "Mitigation of Defects by Modification," Section XI, 2001 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section are prohibited.
10 CFR 50.55a(b)(2)(xxvi)	**(SPT)** *Pressure Testing Class 1, 2, and 3 Mechanical Joints:* The repair and replacement activity provisions in IWA-4540(c) of the 1998 Edition of Section XI for pressure testing Class 1, 2, and 3 mechanical joints must be applied when using the 2001 Edition through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.

TABLE 1.7-1
CODE OF FEDERAL REGULATIONS 10 CFR 50.55A REQUIREMENTS
Sheet 7 of 7

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xxvii)	**(SPT)** *Removal of Insulation:* When performing visual examinations in accordance with IWA-5242 of Section XI, 2003 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of the section, insulation must be removed from 17-4 PH or 410 stainless steel studs or bolts aged at a temperature below 1100 °F or having a Rockwell Method C hardness value above 30, and from A-286 stainless steel studs or bolts preloaded to 100,000 pounds per square inch or higher.

1.8 Code Cases

Per 10 CFR 50.55a(b)(5) and (b)(6), ASME Code Cases that have been determined to be suitable for use in ISI Program Plans by the NRC are listed in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI, Division 1". The approved Code Cases in Regulatory Guide 1.147, which are being utilized by Byron Station, are included in Section 2.1.2. The most recent version of a given Code Case incorporated in the revision of Regulatory Guide 1.147 referenced in 10 CFR 50.55a(b)(5)(i) at the time it is applied within the ISI Program shall be used. The latest version of Regulatory Guide 1.147 incorporated into this document is Revision 14. As this guide is revised, newly approved Code Cases should be assessed for plan implementation at Byron Station.

The use of other Code Cases (than those listed in Regulatory Guide 1.147) may be authorized by the Director of the office of Nuclear Reactor Regulation upon request pursuant to 10 CFR 50.55a(a)(3). Code Cases not approved for use in Regulatory Guide 1.147, which are being utilized by Byron Station through associated relief requests, are included in Section 8.0.

This ISI Program Plan will initially utilize the Draft Regulatory Guide DG-1125 (Proposed Revision 14 of Regulatory Guide 1.147) with the anticipation that the Final Revision 14 of Regulatory Guide 1.147 will be approved prior to the start of the Third Inspection Interval. Byron Station will review the Final Revision 14 of Regulatory Guide 1.147 for ISI Program impact at which time it is published.

This ISI Program Plan will also utilize Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code". The approved Code Case in Regulatory Guide 1.192, which is being utilized by Byron Station, is included in Section 2.1.3. The latest version of Regulatory Guide 1.192 incorporated into this document is Revision 0. As this guide is revised, newly approved Code Cases should be assessed for plan implementation at Byron Station.

1.9 Relief Requests

In accordance with 10 CFR 50.55a, when a licensee either proposes alternatives to ASME Section XI requirements, which provide an acceptable level of quality and safety, determines compliance with ASME Section XI requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or determines that specific ASME Section XI requirements for inservice inspection are impractical, the licensee shall notify the NRC and submit information to support the determination.

The submittal of this information will be referred to in this document as a "Relief Request" or "Request for Relief". Relief Requests for the Third Inspection Interval are included in Section 8.0 of this document. The text of the Relief Requests contained in Section 8.0 will demonstrate one of the following: the proposed alternatives provide an acceptable level of quality and safety per 10 CFR 50.55a(a)(3)(i); or compliance with the specified requirements would result in

hardship or unusual difficulty without a compensating increase in the level of quality and safety per 10 CFR 50.55a(a)(3)(ii), or the code requirements are considered impractical per 10 CFR 50.55a(g)(5)(iii).

Per 10 CFR 50.55a Paragraphs (a)(3) and (g)(6)(i), the Director of the Office of Nuclear Reactor Regulation will evaluate relief requests and "may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility".

2.0 BASIS FOR INSERVICE INSPECTION PROGRAM

2.1 ASME SECTION XI EXAMINATION REQUIREMENTS

2.1.1 Welds and Components, Supports, and Pressure Tests

As required by the Code Of Federal Regulations, Title 10, Part 50, Section 55a, (10 CFR 50.55a), this Program was developed in accordance with the requirements detailed in the 2001 Edition through the 2003 Addenda, of the ASME Boiler and Pressure Vessel Code, Section XI, Division 1, Subsections IWA, IWB, IWC, IWD, IWE, IWF, IWL, Mandatory Appendices, and Inspection Program B of IWA-2432, approved ASME Code Cases, and approved alternatives through relief requests and SERs.

The ISI Program implements Appendix VIII "Performance Demonstration for Ultrasonic Examination Systems," ASME Section XI 2001 Edition, No Addenda as required by 10 CFR 50.55a(b)(2) and modified by 10 CFR 50.55a(b)(2)(xxiv). Appendix VIII requires qualification of the procedures, personnel, and equipment used to detect and size flaws in piping, bolting, and the reactor pressure vessel (RPV). Each organization (e.g., owner or vendor) will be required to have a written program to insure compliance with the requirements. These requirements were initially implemented through the Performance Demonstration Initiative (PDI) Program according to the schedule defined in 10 CFR 50.55a(g)(6)(ii)(C).

For the Third Inspection Interval, Byron Station's inspection program for ASME Section XI Categories B-F, B-J, C-F-1, and C-F-2 will be governed by risk-informed regulations. The RISI Program methodology is described in the EPRI Topical Report TR-112657, Rev. B-A. To supplement the EPRI Topical Report, Code Case N-578-1 (as applicable per Relief Request I3R-02) is also being used for the classification of piping structural elements under the RISI Program. The RISI Program scope will be implemented as an alternative to the 2001 Edition through the 2003 Addenda ASME Section XI Code examination program for Class 1 B-F and B-J welds and Class 2 C-F-1 and C-F-2 welds in accordance with 10 CFR 50.55a(a)(3)(i). The basis for the resulting Risk Categorizations of the non-exempt Class 1 and 2 piping systems at Byron Station is defined and maintained in the Final Report "Risk Informed Inservice Inspection Evaluation" as referenced in Section 9.0 of this document.

For the Third Inspection Interval, the RISI Program scope has been expanded to include welds in the BER piping, also referred to as the HELB region, which includes several non-class welds that fall within the BER augmented inspection program. The BER program methodology is described in EPRI Topical Report TR-1006937, Rev. 0-A, which will be used to define the inspection scope in lieu of the 100% examination of all piping welds in the previous BER augmented program. Therefore, all welds in the original augmented program for BER will be evaluated under the RISI Program using an integrated risk-informed approach.

2.1.2 ASME Section XI Code Cases

As referenced by 10 CFR 50.55a(b)(5) and allowed by NRC Regulatory Guide 1.147, Revision 14, the following Code Cases are being incorporated into the Byron Station ISI Program.

N-432-1 *Repair Welding Using Automatic or Machine Gas Tungsten-Arc Welding (GTAW) Temper Bead Technique, Section XI, Division 1.*

N-460 *Alternative Examination Coverage for Class 1 and Class 2 Welds, Section XI, Division 1.*

N-517-1 *Quality Assurance Program Requirements for Owners, Section XI, Division 1.*

Code Case N-517-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

The Owner's Quality Assurance (QA) Program that is approved under Appendix B to 10 CFR Part 50 must address the use of this Code Case and any unique QA requirements identified by the Code Case that are not contained in the owner's QA Program description. This would include the activities performed in accordance with this Code Case that are subject to monitoring by the Authorized Nuclear Inspector.

N-526 *Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels, Section XI, Division 1.*

N-528-1 *Purchase, Exchange, or Transfer of Material Between Nuclear Plant Sites, Section XI, Division 1.*

Code Case N-528-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

The requirements of 10 CFR Part 21 are to be applied to the nuclear plant site supplying the material as well as to the nuclear plant site receiving the material that has been purchased, exchanged, or transferred between sites.

N-532-1 *Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000, Section XI, Division 1.*

Code Case N-532-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

Code Case N-532-1 requires an Owner's Activity Report Form OAR-1 to be prepared and certified upon completion of each refueling outage. The OAR-1 forms must be submitted to the NRC within 90 days of the completion of the refueling outage.

N-566-2 *Corrective Action for Leakage Identified at Bolted Connections, Section XI, Division 1.*

N-576-1 *Repair of Class 1 and 2 SB-163, UNS N06600 Steam Generator Tubing, Section XI, Division 1.*

Code Case N-576-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

NOTES: Steam Generator tube repair methods require prior NRC approval through the Technical Specifications. This Code Case does not address certain aspects of this repair, e.g., the qualification of inspection and plugging criteria necessary for staff approval of the repair method. In addition, if the user plans to "reconcile," as described in the footnote, the reconciliation is to be performed in accordance with IWA-4200 in the 1995 Edition through the 1996 Addenda of ASME Section XI.

N-586 *Alternative Additional Examination Requirements for Class 1, 2, and 3 Piping, Components, and Supports, Section XI, Division 1.*

N-597-1 *Requirements for Analytical Evaluation of Pipe Wall Thinning, Section XI, Division 1.*

Code Case N-597-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

(1) Code Case must be supplemented by the provisions of EPRI Nuclear Safety Analysis Center Report 202L-R2, April 1999, "Recommendations for an Effective Flow Accelerated Corrosion Program," for developing the inspection requirements, the method of predicting the rate of wall thickness loss, and the value of the predicted remaining wall thickness. As used in NSAC-202L-R2, the terms "should" and "shall" have the same expectation of being completed.
(2) Components affected by flow-accelerated corrosion to which this Code Case are applied must be repaired or replaced in accordance with the construction code of record and Owner's requirements or a later NRC approved edition of Section III of the ASME Code prior to the value of t_p reaching the allowable minimum wall thickness, t_{min}, as specified in -3622.1(a)(1) of this Code Case. Alternatively, use of the Code Case is subject to NRC review and approval.
(3) For Class 1 piping not meeting the criteria of -3221, the use of evaluation methods and criteria is subject to NRC review and approval.
(4) For those components that do not require immediate repair or replacement, the rate of wall thickness loss is to be used to determine a suitable inspection frequency so that repair or replacement occurs prior to reaching allowable minimum wall thickness, t_{min}.
(5) For corrosion phenomenon other than flow accelerated corrosion, use of the Code Case is subject to NRC review and approval. Inspection plans

and wall thinning rates may be difficult to justify for certain degradation mechanisms such as MIC and pitting.

N-600 *Transfer of Welder, Welding Operator, Brazer, and Brazing Operator Qualifications Between Owners, Section XI, Division 1.*

N-613-1 *Ultrasonic Examination of Penetration Nozzles in Vessels, Examination Category B-D, Item Nos. B3.10 and B3.90, Reactor Nozzle-to-Vessel Welds, Figs. IWB-2500-7(a), (b), and (c), Section XI, Division 1.*

N-624 *Successive Inspections, Section XI, Division 1.*

N-638-1 *Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW Temper Bead Technique, Section XI, Division 1.*

Code Case N-638-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

UT volumetric examinations shall be performed with personnel and procedures qualified for the repaired volume and qualified by demonstration using representative samples which contain construction type flaws. The acceptance criteria of NB-5330 in the 1998 Edition through the 2000 Addenda of Section III apply to all flaws identified within the repaired volume.

N-639 *Alternative Calibration Block Material, Section XI, Division 1.*

Code Case N-639 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

Chemical ranges of the calibration block may vary from the materials specification if: (1) it is within the chemical range of the component specification to be inspected, and (2) the phase and grain shape are maintained in the same ranges produced by the thermal process required by the material specification.

N-641 *Alternative Pressure-Temperature Relationship and Low Temperature Overpressure Protection System Requirements, Section XI, Division 1.*

N-643 *Fatigue Crack Growth Rate Curves for Ferritic Steels in PWR Water Environment, Section XI, Division 1.*

N-648-1 *Alternative Requirements for Inner Radius Examinations of Class 1 Reactor Vessel Nozzles, Section XI, Division 1.*

Code Case N-648-1 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

In place of a UT examination, licensees may perform a visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-

mil width wire or crack, utilizing the allowable flaw length criteria of Table IWB-3512-1 with limiting assumptions on the flaw aspect ratio. The provisions of Table IWB-2500-1, Examination Category B-D, continue to apply except that, in place of examination volumes, the surfaces to be examined are the external surfaces shown in the figures applicable to this table.

N-651 *Ferritic and Dissimilar Metal Welding Using SMAW Temper Bead Technique Without Removing the Weld Bead Crown for the First Layer, Section XI, Division 1.*

N-661 *Alternative Requirements for Wall Thickness Restoration of Classes 2 and 3 Carbon Steel Piping for Raw Water Service, Section XI, Division 1.*

Code Case N-661 is acceptable subject to the following conditions specified in Regulatory Guide 1.147, Revision 14.

(a) If the root cause of the degradation has not been determined, the repair is only acceptable for one cycle.
(b) Weld overlay repair of an area can only be performed once in the same location
(c) When through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

N-695 *Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division 1.*

Additional Code Cases may be invoked in the future based on new ISI Program Plan requirements or revisions to Regulatory Guide 1.147. Any Code Cases invoked in the future shall be in accordance with those approved for use in the latest published revision of Regulatory Guide 1.147 at that time.

2.1.3 OM Code Cases

As referenced by 10 CFR 50.55a(b)(6) and allowed by NRC Regulatory Guide 1.192, Revision 0, the following Code Case is being incorporated into the Byron Station ISI Program.

OMN-13, Rev. 0 *Requirements for Extending Snubber Inservice Visual Examination Interval at LWR Power Plants, OM Code.*

Additional Code Cases may be invoked in the future based on new ISI Program Plan requirements or revisions to Regulatory Guide 1.192. Any Code Cases invoked in the future shall be in accordance with those approved for use in the latest published revision of Regulatory Guide 1.192 at that time.

2.2 AUGMENTED EXAMINATION REQUIREMENTS

Augmented examination requirements are those examinations that are performed above and beyond the requirements of ASME Section XI. Below is a summary of those examinations performed by Byron Station that are not specifically addressed by ASME Section XI, or the examinations that will be performed in addition to the requirements of the Code on a routine basis during the Third Inspection Interval.

2.2.1 NRC Branch Technical Position MEB 3-1, "High Energy Fluid Systems, Protection Against Postulated Piping Failures in Fluid Systems Outside Containment", dated November 24, 1975.

UFSAR Sections 3.6.1 and 3.6.2 detail Byron Station compliance with NRC Branch Technical Position MEB 3-1, which includes requirements for licensees to perform a 100% volumetric examination each interval of circumferential and longitudinal pipe welds within the pipe break exclusion regions associated with high energy piping in containment penetration areas.

Implementation of the examination commitments is included in Section 7.0 of this ISI Program Plan and the associated ISI database.

Note: This commitment was previously maintained in accordance with UFSAR Section 3.6.1 and 3.6.2. With the implementation of the RISI-BER Program, all BER augmented welds were evaluated under the RISI methodology and were integrated into the RISI Program. The RISI Program will also include several non-class welds that fall within the BER augmented inspection program. Additional guidance for adaptation of the RISI evaluation process to BER piping is given in EPRI TR-1006937 Rev. 0-A.

2.2.2 NRC Regulatory Guide 1.14, Reactor Coolant Pump Flywheel Integrity

This Regulatory Guide includes inspection requirements for Reactor Coolant Pump Flywheels in Section 4. Exelon has committed to these inspections per UFSAR Appendix A and Technical Specifications Section 5.5.7.

Implementation of the examination commitments is included in Section 7.0 of this ISI Program Plan and the associated ISI database.

2.2.3 Byron Station UFSAR Section 10.2.3, Turbine Disk and Rotor Integrity

This details Byron Station's commitment to perform visual and magnetic particle examination of the accessible areas of the high-pressure turbine rotor, low-pressure turbine blades, and low-pressure disks. In addition, visual examinations of the turbine coupling and coupling bolts are performed.

This program has been removed from the Engineering Group and is maintained by the Turbine Maintenance organization.

2.2.4 NRC Bulletin 88-08, "Thermal Stresses in Piping Connected to Reactor Coolant Systems", including supplements 1, 2, and 3.

With the implementation of the RISI Program, the Bulletin 88-08 augmented inspection commitment will no longer be required at Byron Station. The RISI Program completely subsumes this requirement based on the fact that the Degradation Mechanism assessment and Risk Categorization involve full assessment for Thermal Transients and Thermal Stratification, Cycling, and Striping. Thus, these piping structural elements will be categorized and selected for examination in accordance with the EPRI Topical Report TR-112657, Rev. B-A and Code Case N-578-1 in lieu of the original commitment to Bulletin 88-08.

2.2.5 Information Notice 79-19, *Pipe Cracks in Stagnant Borated Water Systems at PWR Plants.*

Volumetric examinations will be performed on Class 2 ECCS systems (or portions of systems) that are currently not subject to evaluation under the RISI Program. The inspections include 7.5% sampling of the total population of circumferential piping welds (greater than 4 inches nominal pipe size) that contain stagnant borated water.

For the current inspection interval, the areas subject to augmented examination are limited to the 10" Safety Injection piping from the SI Accumulators (1/2SI04TA, B, C, and D) to the class boundary second check valve (1/2SI8956A, B, C, and D). These lines are exempted from ASME Section XI examination by Paragraph IWC-1221(c).

The components selected for these examinations are to be examined before the end of the inspection interval.

2.2.6 NRC NUREG 0737, Section III.D.1.1, dated November 1980.

Requires applicants to implement a program to reduce leakage from systems outside containment that would or could contain highly radioactive fluids or gases during a serious transient or accident to as low as practical levels. In response to this NUREG commitment, Section E.77, Primary Coolant Sources Outside Containment, was included in the Byron/Braidwood Station UFSAR. This UFSAR Section along with Technical Specifications Section 5.5.2 require performance of integrated leak tests at refueling cycle intervals or less on each system or portions of systems, which could potentially contain highly radioactive liquids or gases.

Implementation of the Byron Station program addressing these requirements is included in site procedure BVP 200-7.

2.2.7 Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants

The Nuclear Regulatory Commission issued Generic Letter (GL) 88-05 to all licensees of operating Pressurized Water Reactors (PWR) in March, 1988. This Generic Letter deals with boric acid corrosion of carbon steel reactor coolant pressure boundary components in PWR plants. Specifically, GL 88-05 requested information to assess safe operation of PWR's when reactor coolant leaks below Tech Spec limits develop and the coolant containing Boric Acid comes in contact with and degrades low alloy carbon steel components. Byron Station's response to

GL 88-05 requirements are incorporated through the completion of normal station operator walkdowns, heightened Maintenance and Tech Staff (now System Engineering) training, the normal Inservice Inspection Program, and the ASME Section XI System Pressure Testing Program.

To ensure compliance with this augmented commitment, the Reactor Coolant Pressure Boundary (RCPB), as defined by UFSAR Section 5.2, shall have a system inspection performed by certified VT-2 examiners every refueling outage consisting of a pre-outage visual examination as well as a visual examination conducted prior to startup. These examinations shall be conducted to identify evidence of boric acid crystallization and residue accumulations.

Implementation of the Byron Station program addressing these requirements is included in site procedure BVP-200-7.

2.3 SYSTEM CLASSIFICATIONS AND P&ID BOUNDARY DRAWINGS

The ISI Classification Basis Document details those systems that are ISI Class 1, 2, 3, or MC that fall within the ISI scope of examinations. The concrete containment structure is ISI Class CC and is shown on the containment roll-out drawings. Below is a summary of the classification criteria used within the ISI Classification Basis Document.

Each safety related, fluid system containing water, steam, air, oil, etc. included in the Byron Station UFSAR was reviewed to determine which safety functions they perform during all modes of system and plant operation. Based on these safety functions, the systems and components were evaluated per classification documents. The systems were then designated as ISI Class 1, 2, 3, MC, CC, or non-classed accordingly. This evaluation followed the guidelines of UFSAR Section 5.2.4 for ISI Class 1 and 6.6 for ISI Classes 2 and 3. Safety related portions of systems are defined on the Piping and Instrument Diagrams (P&ID's) and Control and Instrumentation Diagrams (C&ID's).

When a particular group of components is identified as performing a ISI Class 1, 2, or 3 safety function, the components are further reviewed to assure the interfaces (boundary valves and boundary barriers) meet the criteria set by 10CFR50.2, 10CFR50.55a(c)(1), 10CFR50.55a(c)(2), Regulatory Guide 1.26, and ANSI N18.2-1973. Although Byron Station is not committed to or licensed in accordance with these documents, Standard Review Plan (SRP) 3.2.2 "System Quality Group Classification," and other American National Standards Institute/American Nuclear Society (ANSI/ANS) standards were also used for guidance in determining the classification boundaries when 10CFR and Regulatory Guide 1.26 did not address a given situation. The valve positions shown on the system flow diagrams are assumed to be the normal positions during system operation unless otherwise noted.

ISI classification boundaries are defined by the Inservice Inspection ISI Code Boundary Drawings (ISI CBD's) with classification line codes. A summary of the line coding system used on the ISI CBD's to identify safety related systems or portions of

systems subject to examination is included on drawing ISI-CBD-LEGEND. Typically, unhatched, solid coding (blue, yellow and green, Coding Designators 1A, 2A, and 3A, respectively) was used for nonexempt ASME Section XI components. Some hatched codings, (Coding Designators 2HPSI, 2F, and 3C) were also used to identify nonexempt ASME Section XI components. The remaining codings shown on ISI-CBD-LEGEND (Coding Designators 1B, 1C, 1D, 2B, 2C, 2D, 2E, 3B, and 3D) were used to identify exempt ASME Section XI components.

The systems and components (piping, pumps, valves, vessels, etc.), which are subject to the examinations of Articles IWB-2000, IWC-2000, IWD-2000, and IWF-2000 are identified on the ISI CBD's as detailed in Table 2.3-1 and 2.3-2. Containment components subject to examination of Articles IWE-2000 and IWL-2000 are identified on the CISI Drawings shown in Table 2.4-3 and 2.4-4.

TABLE 2.3-1
BYRON STATION COLOR CODED ISI P&ID BOUNDARY DRAWINGS

UNIT 1 & 0	UNIT 2	TITLE
M-34-1, 2, 3, 4, 5	M-34-1, 2, 3, 4, 5	P&ID Index & Symbols
M-35-1, 2	M-120-1, 2A, 2B	Main Steam (MS)
M-36-1A, 1B, 1C, 1D M-152-45	M-121-1A, 1B, 1C, 1D M-152-45	Feedwater (FW)
M-37	M-122	Auxiliary Feedwater (AF)
M-42-1A, 1B, 2A, 2B, 3, 4, 5A, 5B, 6, 7	M-42-1A, 1B, 2A, 2B M-126-1, 2, 3	Essential Service Water (SX)
M-46-1A, 1B, 1C	M-129-1A, 1B, 1C	Containment Spray (CS)
M-47-2	M-150-2	Off Gas Hydrogen Recombiners (OG)
M-48-5A	M-48-5B	Waste Disposal - Steam Generator Blowdown (SD)
M-48-6A, 6B	M-48-6A, 6B	Waste Disposal Aux. Building Floor Drains (RF)
M-48-18	---	Waste Disposal Resin Removal (WX)
M-49-1A	M-49-1B	Make-Up Demineralizer (WM)
M-50-1A, 1B, 1C, 1D, 3	M-130-1A, 1B, 2	Diesel Fuel Oil (DO)
M-52-1	---	Fire Protection (FP)
M-54-2, 4A	M-54-2, 4B	Service Air (SA)
M-55-4, 9	M-55-5, 7D	Instrument Air (IA)
M-59-1A, 1B	M-149	Nitrogen (NT)
M-60-1A, 1B, 2, 3, 4, 5, 6, 8	M-135-1A, 1B, 2, 3, 4, 5, 6, 8	Reactor Coolant (RC & RY)
M-61-1A, 1B, 2, 3, 4, 5, 6	M-136-1, 2, 3, 4, 5, 6	Safety Injection (SI)
M-62	M-137	Residual Heat Removal (RH)
M-63-1A, 1B, 1C	M-63-1A, 1B, 1C	Fuel Pool Cooling and Clean-Up (FC)
M-64-1, 2, 3A, 3B, 4A, 4B, 5	M-138-1, 2, 3A, 3B, 4, 5A, 5B	Chemical and Volume Control (CV)
M-64-6, 7	M-138-6, 7	Chemical and Volume Control / Boron Thermal Regeneration (CV & BR)
M-65-1B, 2A, 3, 5A, 5B	M-65-1B, 5A, 5B	Boric Acid (AB)
M-66-1A, 1B, 2, 3A, 3B, 4A, 4C, 4D	M-66-3A, 3B, 4B, 4C, 4D, M-139-1, 2	Component Cooling (CC)
M-68-1A, 1B, 6, 7, 8	M-140-1, 5, 6	Process Sampling (PS)
M-69-1, 2, 3	---	Radioactive Waste Gas (GW)
M-70-1, 2	M-141-1, 2	Reactor Building Equipment Drains & Vents to Radwaste (RE)

TABLE 2.3-1
BYRON STATION COLOR CODED ISI P&ID BOUNDARY DRAWINGS
(Continued)

UNIT 1 & 0	UNIT 2	TITLE
M-78-6, 10	M-78-6, M-151-1	Process Radiation Monitoring (PR)
M-82-1, 2, 3, 5, 15	M-82-1, 2, 3, 5, 6	Auxiliary Building & Containment Equipment Drains (WE)
M-105-1	M-106-1	Containment Purge / Pressure & Vacuum Relief Systems (VQ & VP)
M-105-3	M-105-3	Integrated Leak Rate System (VQ)
M-118-1, 5, 14	M-118-7	Control Room Chilled Water (WO)
M-152-9	M-152-9, 10	Diesel Generator Lube Oil (DG & DO)
M-152-14	M-152-14	Diesel Generator Jacket Water (DG)
M-152-19	M-152-19	Diesel Generator Cooling Water (DG)

TABLE 2.3-2
BYRON STATION COLOR CODED ISI C&ID BOUNDARY DRAWINGS

UNIT 1 & 0	UNIT 2	TITLE
M-2060-6, 7, 8, 17, 18	M-2135-6, 7, 8, 17, 18	C&ID Reactor Coolant System (RC)

2.4 ISI ISOMETRIC AND COMPONENT DRAWINGS FOR NONEXEMPT ISI CLASS COMPONENTS AND SUPPORTS

ISI Isometric and Component drawings were developed to detail the ISI Code Class 1, 2, 3, MC, and CC components (welds, bolting, etc.) and support locations at Byron Station. These component and support locations are identified on the ISI Isometric and Component drawings listed in Tables 2.4-1, 2.4-2, 2.4-3, and 2.4-4.

Byron Station's ISI Program, including the ISI Database, ISI Classification Basis Document, and ISI Selection Document, addresses the non-exempt components, which require examination and testing.

A summary of Byron Station Unit 1 and 2 ASME Section XI nonexempt components and supports is included in Section 7.0.

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
AUXILIARY FEEDWATER SYSTEM (AF)		
1AF-12-B-T	---	Auxiliary Feedwater Lines 1AF02DB-4", 1AF02DF-4", and 1AF02EB-4"
1AF-12-C-T	---	Auxiliary Feedwater Lines 1AF02DC-4", 1AF02DG-4", and 1AF02EC-4"
1AF-13-A-T	---	Auxiliary Feedwater Lines 1AF02DA-4", 1AF02DE-4", and 1AF02EA-4"
1AF-13-D-T	---	Auxiliary Feedwater Lines 1AF02DD-4", 1AF02DH-4", and 1AF02ED-4"
1FW-39-T	---	Auxiliary Feedwater Lines 1FW06AB-4" and 1FW87BB-3"
1FW-40-T	---	Auxiliary Feedwater Lines 1FW06AC-4" and 1FW87BC-3"
1FW-51-T	---	Auxiliary Feedwater Lines 1FW06AA-4" and 1FW87BA-3"
1FW-52-T	---	Auxiliary Feedwater Lines 1FW06AD-4" and 1FW87BD-3"
CONTAINMENT SPRAY SYSTEM (CS)		
1CS-1-ISI	1	Containment Spray Line 1CS02AA-10"
1CS-1-ISI	2	Containment Spray Line 1CS10AA-6"
1CS-1-ISI	3	Containment Spray Lines 1CS01AA-16", 1CS23AA-14", and 1CS06AA-6"
1CS-1-ISI	4	Containment Spray Lines 1CS01AB-16", 1CS23AB-14", and 1CS06AB-6"
1CS-1-ISI	5	Containment Spray Line 1CS02AB-10"
1CS-1-ISI	6	Containment Spray Lines 1CS02AB-10" and 1CS10AB-6"
1CS-1-ISI	7	Containment Spray Line 1CS02AA-10"
1VCT-1-ISI	---	Containment Spray Pumps 1CS-01-PA-1 and 1CS-01-PB-2
CHEMICAL & VOLUME CONTROL SYSTEM (CV)		
1CV-1-ISI	1	Chemical & Volume Control Line 1CVB7A-3"
1CV-1-ISI	2	Chemical & Volume Control Lines 1RY18A-2" and 1CV45B-2"
1CV-1-ISI	3	Chemical & Volume Control Lines 1CV14FB-2" and 1CV14GB-1½"
1CV-1-ISI	4	Chemical & Volume Control Lines 1CVA5AB-2" and 1CVA6AB-2"
1CV-1-ISI	5	Chemical & Volume Control Line 1CVA3B-2"
1CV-1-ISI	6	Chemical & Volume Control Lines 1CV14FA-2" and 1CV14FD-2"
1CV-1-ISI	7	Chemical & Volume Control Line 1CVA3B-2"
1CV-1-ISI	8	Chemical & Volume Control Line 1CVA5AA-2"
1CV-1-ISI	9	Chemical & Volume Control Lines 1CVA3B-2", 1CVA3AB-2", and 1CVA7AB-2"
1CV-1-ISI	10	Chemical & Volume Control Line 1CVA3AB-2"
1CV-1-ISI	11	Chemical & Volume Control Lines 1CVA3B-2" and 1CVA6AA-2"
1CV-1-ISI	12	Chemical & Volume Control Line 1CV45B-2"
1CV-1-ISI	13	Chemical & Volume Control Line 1CVA3B-2"
1CV-1-ISI	14	Chemical & Volume Control Line 1CVA3B-2"
1CV-1-ISI	15	Chemical & Volume Control Line 1CVA3B-2"
1CV-1-ISI	16	Chemical & Volume Control Lines 1CV14FC-2" and 1CV14GC-1½"

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
CHEMICAL & VOLUME CONTROL SYSTEM (CV) [Continued]		
1CV-1-ISI	17	Chemical & Volume Control Lines 1CV99A-8", 1CV05B-8", and 1CVA1A-6"
1CV-1-ISI	18	Chemical & Volume Control Lines 1CV05B-8", 1CV05CA-6", 1CV98BA-8", 1CV98BB-8", and 1CV98BC-8"
1CV-1-ISI	19	Chemical & Volume Control Line 1CV05CB-6"
1CV-1-ISI	20	Chemical & Volume Control Lines 1CV08AB-4", 1CV12AA-3", and 1CV42AA-2"
1CV-1-ISI	21	Chemical & Volume Control Lines 1CVJ4A-4", 1CV09A-4", and 1CV08BA-4"
FEEDWATER SYSTEM (FW)		
1FW-1-ISI	1	Feedwater Lines 1FW03DD-16" and 1FW86AD-16"
1FW-1-ISI	2	Feedwater Lines 1FW03DA-16" and 1FW86AA-16"
1FW-1-ISI	3	Feedwater Lines 1FW86AB-16" and 1FW03DB-16"
1FW-1-ISI	4	Feedwater Lines 1FW03DC-16" and 1FW86AC-16"
1FW-1-ISI	5	Feedwater Lines 1FW81AB-6", 1FW81BB-6", and 1FW87CB-6"
1FW-1-ISI	10	Feedwater Lines 1FW81AC-6", 1FW81BC-6", and 1FW87CC-6"
1FW-1-ISI	11	Feedwater Lines 1FW81AA-6", 1FW81BA-6", and 1FW87CA-6"
1FW-1-ISI	12	Feedwater Lines 1FW81AD-6", 1FW81BD-6", and 1FW87CD-6"
MAIN STEAM SYSTEM (MS)		
1MS-1-ISI	1	Main Steam Line 1MS01AD-30 1/4" (Loop 4)
1MS-1-ISI	2	Main Steam Lines 1MS01BD-30 1/4", 1MS07AD-28", 1MS13AD-8", 1MS07BD-28", and 1MS143AD-12" (Loop 4)
1MS-1-ISI	3	Main Steam Line 1MS01AA-30 1/4" (Loop 1)
1MS-1-ISI	4	Main Steam Lines 1MS01BA-30 1/4", 1MS07AA-28", 1MS13AA-8", 1MS07BA-28", and 1MS143AA-12" (Loop 1)
1MS-1-ISI	5	Main Steam Line 1MS01AB-32 3/4" (Loop 2)
1MS-1-ISI	6	Main Steam Lines 1MS01BB-32 3/4", 1MS07AB-28", 1MS13AB-8", 1MS07BB-28", and 1MS143AB-12" (Loop 2)
1MS-1-ISI	7	Main Steam Line 1MS01AC-32 3/4" (Loop 3)
1MS-1-ISI	8	Main Steam Lines 1MS01BC-32 3/4", 1MS07AC-28", 1MS13AC-8", 1MS143AC-12", and 1MS07BC-28" (Loop 3)
REACTOR COOLANT SYSTEM (RC & RY)		
1RC-1-ISI	1	Primary Coolant System Loop 1 To Steam Gen. No. 1RC-01-BA
1RC-1-ISI	2	Primary Coolant System Loop 2 To Steam Gen. No. 1RC-01-BB
1RC-1-ISI	3	Primary Coolant System Loop 3 To Steam Gen. No. 1RC-01-BC
1RC-1-ISI	4	Primary Coolant System Loop 4 To Steam Gen. No. 1RC-01-BD
1RC-1-ISI	5	Reactor Coolant Surge Line 1RY11A-14"
1RC-1-ISI	6	Reactor Coolant Lines 1RC21AA-8" and 1RC21BA-8"

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
REACTOR COOLANT SYSTEM (RC & RY) [Continued]		
1RC-1-ISI	7	Reactor Coolant Lines 1RC28A-3", 1CV10DA-3", 1RC37A-3", 1CV10DB-3", and 1RC36A-3"
1RC-1-ISI	9	Reactor Coolant Line 1RC21AB-8"
1RC-1-ISI	11	Reactor Coolant Lines 1RC04AB-12" and 1RC05AB-6"; Residual Heat Removal Line 1RH01AB-12"
1RC-1-ISI	12	Reactor Coolant Lines 1RC21AC-8" and 1RC21BC-8"
1RC-1-ISI	14	Reactor Coolant Lines 1RC24AB-4" and 1RY01AB-4"
1RC-1-ISI	15	Reactor Coolant Lines 1RC21AD-8" and 1RC21BD-8"
1RC-1-ISI	16	Reactor Coolant Lines 1RY01B-6" and 1RY01C-4"
1RC-1-ISI	17	Reactor Coolant Lines 1RC24AA-4" 1RY01AA-4", 1RY01AB-4", and 1RY01B-6"
1RC-1-ISI	19	Reactor Coolant Lines 1RC22AB-1½" and 1RC46AB-3"
1RC-1-ISI	20	Reactor Coolant Lines 1RC22AD-1½" and 1RC46AD-3"
1RC-1-ISI	21	Reactor Coolant Line 1RC22AB-1½"
1RC-1-ISI	22	Reactor Coolant Lines 1RC05AA-6" (Loop 2) and 1RC35AB-6" (Loop 4)
1RC-1-ISI	23	Reactor Coolant Lines 1RC22AA-1½" and 1RC46AA-3"
1RC-1-ISI	24	Reactor Coolant Lines 1RC22AC-1½" and 1RC46AC-3"
1RC-1-ISI	27	Reactor Coolant Lines 1RC22AA-1½" and 1RC22AC-1½"
1RC-1-ISI	29	Reactor Coolant Lines 1RC16AC-2" (Loop 3) and 1RC16AD-2" (Loop 4)
1RC-1-ISI	30	Reactor Coolant Lines 1RC13AA-2", 1RC13AB-2", 1RC13AC-2", and 1RC13AD-2"
1RC-1-ISI	31	Reactor Coolant Lines 1RC14AB-2" (Loop 2) and 1RC26A-2" (Loop 4)
1RC-1-ISI	32	Reactor Coolant Lines 1RY03AA-6", 1RY03AB-6", 1RY03AC-6", 1RY03BA-6", 1RY03BB-6", and 1RY03BC-6"
1RC-1-ISI	35	Reactor Coolant Lines 1RY02A-6", 1RY06A-3", and 1RY02B-3"
1RC-1-ISI	36	Reactor Coolant Lines 1RC14AA-2" and 1CVA3AA-2"
1RC-1-ISI	37	Reactor Coolant Lines 1RC14AD-2" and 1CVA7AA-2"
1RC-1-ISI	41	Reactor Coolant Lines 1RC16AA-2" (Loop 1) and 1RC16AB-2" (Loop 2)
1RC-1-ISI	42	Reactor Coolant Line 1RC14AC-2"
1PZR-1-ISI	---	Pressurizer No. 1RY-01-S
1RCP-1-ISI	---	Reactor Coolant Pumps 1RC-01-PA, 1RC-01-PB, 1RC-01-PC, and 1RC-01-PD
1RPV-1-ISI	---	Reactor Pressure Vessel No. 1RC-01-R
1SG-1-ISI	5	Replacement Steam Generator No. 1RC-01-BA
1SG-1-ISI	6	Replacement Steam Generator No. 1RC-01-BB
1SG-1-ISI	7	Replacement Steam Generator No. 1RC-01-BC
1SG-1-ISI	8	Replacement Steam Generator No. 1RC-01-BD

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
RESIDUAL HEAT REMOVAL SYSTEM (RH)		
1RH-1-ISI	1	Residual Heat Removal Line 1RH01AB-12"
1RH-1-ISI	2	Residual Heat Removal Line 1RH01AA-12"
1RH-1-ISI	3	Residual Heat Removal Lines 1RH03AA-8" and 1RH12A-8"
1RH-1-ISI	4	Residual Heat Removal Lines 1RH01BA-12" and 1RH01CA-16"
1RH-1-ISI	5	Residual Heat Removal Lines 1RH02AA-8" and 1RH09AA-8"
1RH-1-ISI	6	Residual Heat Removal Lines 1RH02AB-8", 1RH03AB-8", and 1RH09AB-8"
1RH-1-ISI	7	Residual Heat Removal Lines 1RH03AB-8", 1RH14A-8", and 1RH03AA-8"
1RH-1-ISI	8	Residual Heat Removal Lines 1RH01BB-12", 1RH01CB-16", and 1SI82BB-12"
1RH-1-ISI	9	Residual Heat Removal Line 1RH02AB-8"
1RHP-1-ISI	---	Residual Heat Removal Pumps 1RH-01-PA-1-1A and 1RH-01-PB-2-1B
1RHX-1-ISI	---	Residual Heat Exchanger Nos. 1RH-02-AA and 1RH-02-AB
STEAM GENERATOR BLOWDOWN (SD)		
1SD-1-ISI	1	Inservice Inspection Isometric Cont. Bldg. & Safety Valve Rm. – Loop 1
1SD-1-ISI	2	Inservice Inspection Isometric Cont. Bldg. & Safety Valve Rm. – Loop 2
1SD-1-ISI	3	Inservice Inspection Isometric Cont. Bldg. & Safety Valve Rm. – Loop 3
1SD-1-ISI	4	Inservice Inspection Isometric Cont. Bldg. & Safety Valve Rm. – Loop 4
SAFETY INJECTION SYSTEM (SI)		
1SI-1-ISI	1	Safety Injection Lines 1RC29AA-10" and 1SI09BA-10"
1SI-1-ISI	2	Safety Injection Lines 1SIA4B-8", 1SI03FA-2", 1RC04AA-12", and 1RC35AA-6"
1SI-1-ISI	3	Safety Injection Line 1SI05DA-6"
1SI-1-ISI	4	Safety Injection Lines 1SI05BA-8", 1SI05CA-8", and 1SI05CD-8"
1SI-1-ISI	5	Safety Injection Lines 1RC29AB-10" and 1SI09BB-10"
1SI-1-ISI	6	Safety Injection Lines 1SI05DB-6" and 1SI18FB-2"
1SI-1-ISI	7	Safety Injection Lines 1SI08FA-3", 1SI08FB-3", and 1SI08E-3"
1SI-1-ISI	8	Safety Injection Line 1SI08FA-3"
1SI-1-ISI	9	Safety Injection Lines 1RC29AC-10" and 1SI09BC-10"
1SI-1-ISI	10	Safety Injection Lines 1SI05DC-6" and 1SI18FC-2"
1SI-1-ISI	11	Safety Injection Lines 1SI04D-8" and 1SI03DB-2"
1SI-1-ISI	12	Safety Injection Lines 1SI04A-12", 1SI04B-12", 1SI04C-8", and 1SIA4A-8"
1SI-1-ISI	13	Safety Injection Lines 1RC29AD-10" and 1SI09BD-10"
1SI-1-ISI	14	Safety Injection Line 1SI05DD-6"
1SI-1-ISI	15	Safety Injection Lines 1SI08JC-1½" 1RC45AC-3", and 1RC30AC-1½"

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
		SAFETY INJECTION SYSTEM (SI) (Continued)
1SI-1-ISI	16	Safety Injection Lines 1SI08JD-1½", 1RC45AD-3", and 1RC30AD-1½"
1SI-1-ISI	17	Safety Injection Lines 1SI08JB-1½", 1RC45AB-3", and 1RC30AB-1½"
1SI-1-ISI	18	Safety Injection Lines 1SI08HB-2", 1SI08GB-1½", and 1SI08JB-1½"
1SI-1-ISI	19	Safety Injection Lines 1SI08GA-1½", 1SI08HA-2", and 1SI08JA-1½"
1SI-1-ISI	20	Safety Injection Lines 1SI08GC-1½", 1SI08HC-2", 1SI08JC-1 ½", 1SI08GD-1½", 1SI08HD-2", and 1SI08JD-1½"
1SI-1-ISI	21	Safety Injection Line 1SI03DA-2"
1SI-1-ISI	22	Safety Injection Line 1SI03FB-2"
1SI-1-ISI	23	Safety Injection Lines 1SI18FA-2" and 1SI18FD-2", and Reactor Coolant Line 1RY76A-2"
1SI-1-ISI	24	Safety Injection Lines 1SI06BA-24" and 1SI06BB-24"
1SI-1-ISI	25	Safety Injection Line 1SI05AA-8"
1SI-1-ISI	26	Safety Injection Lines 1SI05BB-8", 1SI05CB-8", and 1SI05CC-8"
1SI-1-ISI	27	Safety Injection Line 1SI08JD-1½"
1SI-1-ISI	29	Safety Injection Line 1SI08JC-1½"
1SI-1-ISI	31	Safety Injection Lines 1SI08JA-1½", 1RC30AA-1½", and 1RC45AA-3"
1SI-1-ISI	32	Safety Injection Line 1SI05AB-8"
1SI-1-ISI	33	Safety Injection Line 1SI34A-8"
1SI-1-ISI	34	Safety Injection Lines 1SI02A-8", 1SI01B-24", and 1SI82AB-12"
1SI-1-ISI	35	Safety Injection Lines 1SI82AA-12", 1SI01A-8", 1SI53AA-14", and 1SI01B-24"
1SI-1-ISI	36	Safety Injection Lines 1SI02BB-6", 1SIF9A-8", and 1SI02BA-6"
1SI-1-ISI	37	Safety Injection Lines 1SI13A-6", 1SI13BA-6", and 1SI13BB-6"
1SI-1-ISI	38	Safety Injection Lines 1SI08D-3", 1SI08B-4", 1SI08CA-4", and 1SI08CB-4"

TABLE 2.4-1
BYRON STATION UNIT 1 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
ESSENTIAL SERVICE WATER SYSTEM (SX)		
1SX-1-ISI	1	Essential Service Water Lines 1SX06EA-10", 1SX06CA-14", and 1SX06BA-16"
1SX-1-ISI	2	Essential Service Water Lines 1SX06DC-10", 1SX06EC-10", 1SX08AC-10", and 1SX08BC-10"
1SX-1-ISI	3	Essential Service Water Lines 1SX06EA-10", 1SX06FA-10", 1SX08AA-10", and 1SX08BA-10"
1SX-1-ISI	4	Essential Service Water Lines 1SX06EB-10", 1SX06CB-14", and 1SX06BB-16"
1SX-1-ISI	5	Essential Service Water Lines 1SX06DD-10", 1SX06ED-10", 1SX08AD-10", and 1SX08BD-10"
1SX-1-ISI	6	Essential Service Water Lines 1SX06EB-10", 1SX06FB-10", 1SX08AB-10", and 1SX08BB-10"
1SX-1-ISI	7	Essential Service Water Lines 1SX07CB-10", 1SX07EB-14", and 1SX07FB-16"
1SX-1-ISI	8	Essential Service Water Lines 1SX07BB-10", 1SX07CB-10", 1SX09CB-10", and 1SX09BB-10"
1SX-1-ISI	9	Essential Service Water Lines 1SX07BD-10", 1SX07CD-10", 1SX09BD-10", and 1SX09CD-10"
1SX-1-ISI	10	Essential Service Water Lines 1SX07CA-10", 1SX07EA-14", and 1SX07FA-16"
1SX-1-ISI	11	Essential Service Water Lines 1SX07BA-10", 1SX07CA-10", 1SX09CA-10", and 1SX09BA-10"
1SX-1-ISI	12	Essential Service Water Lines 1SX07CC-10", 1SX07BC-10", 1SX09CC-10", and 1SX09BC-10"
PRIMARY CONTAINMENT PURGE (VQ)		
1VQ-1-ISI	1	Primary Containment Purge Lines 1VQ03A-8", 1VQ04A-8", 1VQ05A-8", 1VQ01A-48", and 1VQ02A-48"

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
		AUXILIARY FEEDWATER SYSTEM (AF)
2AF-27-B-T	---	Auxiliary Feedwater Lines 2AF02DB-4", 2AF02DF-4", and 2AF02EB-4"
2AF-27-C-T	---	Auxiliary Feedwater Lines 2AF02DC-4", 2AF02DG-4", and 2AF02EC-4"
2AF-28-A-T	---	Auxiliary Feedwater Lines 2AF02DA-4", 2AF02DE-4", and 2AF02EA-4"
2AF-28-D-T	---	Auxiliary Feedwater Lines 2AF02DD-4", 2AF02DH-4", and 2AF02ED-4"
2FW-70-T	---	Auxiliary Feedwater Lines 2FW06AB-4" and 2FW87BB-3"
2FW-73-T	---	Auxiliary Feedwater Lines 2FW06AA-4" and 2FW87BA-3"
2FW-74-T	---	Auxiliary Feedwater Lines 2FW06AD-4" and 2FW87BD-3"
2FW-77-T	---	Auxiliary Feedwater Lines 2FW06AC-4" and 2FW87BC-3"
		CONTAINMENT SPRAY SYSTEM (CS)
2CS-1-ISI	1	Containment Spray Line 2CS02AA-10"
2CS-1-ISI	2	Containment Spray Line 2CS10AA-6"
2CS-1-ISI	3	Containment Spray Lines 2CS01AA-16" and 2CS23AA-14"
2CS-1-ISI	4	Containment Spray Lines 2CS01AB-16" and 2CS23AB-14"
2CS-1-ISI	5	Containment Spray Line 2CS02AB-10"
2CS-1-ISI	6	Containment Spray Lines 2CS02AB-10" and 2CS10AB-6"
2CS-1-ISI	7	Containment Spray Line 2CS02AA-10"
2CS-1-ISI	8	Containment Spray Lines 2CS06AA-6" and 2CS06AB-6"
2VCT-1-ISI	---	Containment Spray Pumps 2CS-01-PA-1 and 2CS-01-PB-2
		CHEMICAL & VOLUME CONTROL SYSTEM (CV)
2CV-1-ISI	1	Chemical & Volume Control Line 2CVB7A-3"
2CV-1-ISI	2	Chemical & Volume Control Lines 2RY18A-2" and 2CV45B-2"
2CV-1-ISI	3	Chemical & Volume Control Lines 2CV14FB-2" and 2CV14GB-1½"
2CV-1-ISI	4	Chemical & Volume Control Lines 2CVA5AB-2" and 2CVA6AB-2"
2CV-1-ISI	5	Chemical & Volume Control Line 2CVA3B-2"
2CV-1-ISI	6	Chemical & Volume Control Lines 2CV14FA-2", 2CV14FD-2", and 2CV14GB-1½
2CV-1-ISI	7	Chemical & Volume Control Line 2CVA3B-2"
2CV-1-ISI	8	Chemical & Volume Control Line 2CVA5AA-2"
2CV-1-ISI	9	Chemical & Volume Control Lines 2CVA3B-2", 2CVA3AB-2", and 2CVA7AB-2"
2CV-1-ISI	10	Chemical & Volume Control Line 2CVA3AB-2"
2CV-1-ISI	11	Chemical & Volume Control Lines 2CVA3B-2" and 2CVA6AA-2"
2CV-1-ISI	12	Chemical & Volume Control Line 2CV45B-2"
2CV-1-ISI	13	Chemical & Volume Control Line 2CVA3B-2"
2CV-1-ISI	14	Chemical & Volume Control Line 2CVA3B-2"
2CV-1-ISI	15	Chemical & Volume Control Line 2CVA3B-2"

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
CHEMICAL & VOLUME CONTROL SYSTEM (CV) [Continued]		
2CV-1-ISI	16	Chemical & Volume Control Lines 2CV14FC-2" and 2CV14GC-1½"
2CV-1-ISI	17	Chemical & Volume Control Lines 2CV99A-8", 2CV05B-8", and 2CVA1A-6"
2CV-1-ISI	18	Chemical & Volume Control Lines 2CV05B-8", 2CV05CA-6", 2CV98BA-8", 2CV98BB-8", and 2CV98BC-8"
2CV-1-ISI	19	Chemical & Volume Control Line 2CV05CB-6"
2CV-1-ISI	20	Chemical & Volume Control Lines 2CV08AB-4", 2CV12AA-3", and 2CV42AA-2"
2CV-1-ISI	21	Chemical & Volume Control Lines 2CVJ4A-4", 2CV09A-4", and 2CV08BA-4"
FEEDWATER SYSTEM (FW)		
2FW-1-ISI	1	Feedwater Lines 2FW03DD-16" and 2FW86AD-16"
2FW-1-ISI	2	Feedwater Lines 2FW03DA-16" and 2FW86AA-16"
2FW-1-ISI	3	Feedwater Lines 2FW86AB-16" and 2FW03DB-16"
2FW-1-ISI	4	Feedwater Lines 2FW03DC-16" and 2FW86AC-16"
2FW-1-ISI	5	Feedwater Lines 2FW81AB-6", 2FW81BB-6", and 2FW87CB-6"
2FW-1-ISI	6	Feedwater Line 2FW87CB-6"
2FW-1-ISI	7	Feedwater Line 2FW87CC-6"
2FW-1-ISI	8	Feedwater Line 2FW87CD-6"
2FW-1-ISI	9	Feedwater Line 2FW87CA-6"
2FW-1-ISI	10	Feedwater Lines 2FW81AC-6", 2FW81BC-6", and 2FW87CC-6"
2FW-1-ISI	11	Feedwater Lines 2FW81AA-6", 2FW81BA-6", and 2FW87CA-6"
2FW-1-ISI	12	Feedwater Lines 2FW81AD-6", 2FW81BD-6", and 2FW87CD-6"
MAIN STEAM SYSTEM (MS)		
2MS-1-ISI	1	Main Steam Line 2MS01AD-30 1/4" (Loop 4)
2MS-1-ISI	2	Main Steam Lines 2MS01BD-30 1/4", 2MS07AD-28", 2MS13AD-8", 2MS07BD-28", and 2MS143AD-12" (Loop 4)
2MS-1-ISI	3	Main Steam Line 2MS01AA-30 1/4" (Loop 1)
2MS-1-ISI	4	Main Steam Lines 2MS01BA-30 1/4", 2MS07AA-28", 2MS13AA-8", 2MS07BA-28", and 2MS143AA-12" (Loop 1)
2MS-1-ISI	5	Main Steam Line 2MS01AB-32 3/4" (Loop 2)
2MS-1-ISI	6	Main Steam Lines 2MS01BB-32 3/4", 2MS07AB-28", 2MS13AB-8", and 2MS143AB-12" (Loop 2)
2MS-1-ISI	7	Main Steam Line 2MS01AC-32 3/4" (Loop 3)
2MS-1-ISI	8	Main Steam Lines 2MS01BC-32 3/4", 2MS07AC-28", 2MS13AC-8", and 2MS143AC-12"
REACTOR COOLANT SYSTEM (RC & RY)		
2RC-1-ISI	1	Primary Coolant System Loop 1 To Steam Gen. No. 2RC-01-BA
2RC-1-ISI	2	Primary Coolant System Loop 2 To Steam Gen. No. 2RC-01-BB

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
REACTOR COOLANT SYSTEM (RC & RY) [Continued]		
2RC-1-ISI	3	Primary Coolant System Loop 3 To Steam Gen. No. 2RC-01-BC
2RC-1-ISI	4	Primary Coolant System Loop 4 To Steam Gen. No. 2RC-01-BD
2RC-1-ISI	5	Reactor Coolant Surge Line 2RY11A-14"
2RC-1-ISI	6	Reactor Coolant Lines 2RC21AA-8" and 2RC21BA-8"
2RC-1-ISI	7	Reactor Coolant Lines 2RC28A-3", 2CV10DA-3", 2RC37A-3", 2CV10DB-3", and 2RC36A-3"
2RC-1-ISI	9	Reactor Coolant Lines 2RC21AB-8" and 2RC21BB-8"
2RC-1-ISI	11	Reactor Coolant Lines 2RC04AB-12" and 2RC05AB-6"; Residual Heat Removal Line 2RH01AB-12"
2RC-1-ISI	12	Reactor Coolant Lines 2RC21AC-8" and 2RC21BC-8"
2RC-1-ISI	14	Reactor Coolant Lines 2RC24AB-4" and 2RY01AB-4"
2RC-1-ISI	15	Reactor Coolant Lines 2RC21AD-8" and 2RC21BD-8"
2RC-1-ISI	16	Reactor Coolant Lines 2RY01B-6" and 2RY01C-4"
2RC-1-ISI	17	Reactor Coolant Lines 2RC24AA-4" 2RY01AA-4", 2RY01AB-4", and 2RY01B-6"
2RC-1-ISI	19	Reactor Coolant Lines 2RC22AB-1½" and 2RC46AB-3"
2RC-1-ISI	20	Reactor Coolant Lines 2RC22AD-1½" and 2RC46AD-3"
2RC-1-ISI	21	Reactor Coolant Line 2RC22AB-1½"
2RC-1-ISI	22	Reactor Coolant Lines 2RC05AA-6" (Loop 2) and 2RC35AB-6" (Loop 4)
2RC-1-ISI	23	Reactor Coolant Lines 2RC22AA-1½" and 2RC46AA-3"
2RC-1-ISI	24	Reactor Coolant Lines 2RC22AC-1½" and 2RC46AC-3"
2RC-1-ISI	27	Reactor Coolant Lines 2RC22AA-1½" and 2RC22AC-1½"
2RC-1-ISI	29	Reactor Coolant Lines 2RC16AC-2" (Loop 3) and 2RC16AD-2" (Loop 4)
2RC-1-ISI	30	Reactor Coolant Lines 2RC13AA-2", 2RC13AB-2", 2RC13AC-2", and 2RC13AD-2"
2RC-1-ISI	31	Reactor Coolant Lines 2RC14AB-2" (Loop 2) and 2RC26A-2" (Loop 4)
2RC-1-ISI	32	Reactor Coolant Lines 2RY03AA-6", 2RY03AB-6", 2RY03AC-6", 2RY03BA-6", 2RY03BB-6", and 2RY03BC-6"
2RC-1-ISI	35	Reactor Coolant Lines 2RY02A-6", 2RY06A-3", and 2RY02B-3"
2RC-1-ISI	36	Reactor Coolant Lines 2RC14AA-2" and 2CVA3AA-2"
2RC-1-ISI	37	Reactor Coolant Lines 2RC14AD-2" and 2CVA7AA-2"
2RC-1-ISI	41	Reactor Coolant Lines 2RC16AA-2" (Loop 1) and 2RC16AB-2" (Loop 2)
2RC-1-ISI	42	Reactor Coolant Line 2RC14AC-2"
2PZR-1-ISI	---	Pressurizer No. 2RY-01-S
2RCP-1-ISI	---	Reactor Coolant Pumps 2RC-01-PA, 2RC-01-PB, 2RC-01-PC, and 2RC-01-PD
2RPV-1-ISI	---	Reactor Pressure Vessel No. 2RC-01-R

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
REACTOR COOLANT SYSTEM (RC & RY) [Continued]		
2SG-1-ISI	1	Steam Generator No. 2RC-01-BA
2SG-1-ISI	2	Steam Generator No. 2RC-01-BB
2SG-1-ISI	3	Steam Generator No. 2RC-01-BC
2SG-1-ISI	4	Steam Generator No. 2RC-01-BD
RESIDUAL HEAT REMOVAL SYSTEM (RH)		
2RH-1-ISI	1	Residual Heat Removal Line 2RH01AB-12"
2RH-1-ISI	2	Residual Heat Removal Line 2RH01AA-12"
2RH-1-ISI	3	Residual Heat Removal Line 2RH03AA-8"
2RH-1-ISI	4	Residual Heat Removal Line 2RH01CA-16"
2RH-1-ISI	5	Residual Heat Removal Lines 2RH02AA-8" and 2RH09AA-8"
2RH-1-ISI	6	Residual Heat Removal Line 2RH03AB-8"
2RH-1-ISI	7	Residual Heat Removal Lines 2RH03AB-8", 2RH14A-8", and 2RH03AA-8"
2RH-1-ISI	8	Residual Heat Removal Line 2RH01CB-16"
2RH-1-ISI	9	Residual Heat Removal Line 2RH02AB-8"
2RH-1-ISI	10	Residual Heat Removal Lines 2RH03AA-8" and 2RH12A-8"
2RH-1-ISI	11	Residual Heat Removal Line 2RH01BC-12" and 2SI82BB-12"
2RH-1-ISI	12	Residual Heat Removal Line 2RH01BA-12"
2RH-1-ISI	13	Residual Heat Removal Line 2RH02AB-8" and 2RH09AB-8"
2RHP-1-ISI	---	Residual Heat Removal Pumps 2RH01PA-1-1A and 2RH01PB-2-1B
2RHX-1-ISI	---	Residual Heat Exchanger Nos. 2RH02AA and 2RH02AB
SAFETY INJECTION SYSTEM (SI)		
2SI-1-ISI	1	Safety Injection Lines 2RC29AA-10" and 2SI09BA-10"
2SI-1-ISI	2	Safety Injection Lines 2SIA4B-8", 2SI03FA-2", 2RC04AA-12", and 2RC35AA-6"
2SI-1-ISI	3	Safety Injection Line 2SI05DA-6"
2SI-1-ISI	4	Safety Injection Lines 2SI05BA-8", 2SI05CA-8", and 2SI05CD-8"
2SI-1-ISI	5	Safety Injection Lines 2RC29AB-10" and 2SI09BB-10"
2SI-1-ISI	6	Safety Injection Lines 2SI05DB-6" and 2SI18FB-2"
2SI-1-ISI	7	Safety Injection Lines 2SI08FA-3", 2SI08FB-3", and 2SI08E-3"
2SI-1-ISI	8	Safety Injection Line 2SI08FA-3"
2SI-1-ISI	9	Safety Injection Lines 2RC29AC-10" and 2SI09BC-10"
2SI-1-ISI	10	Safety Injection Lines 2SI05DC-6" and 2SI18FC-2"
2SI-1-ISI	11	Safety Injection Lines 2SI04D-8" and 2SI03DB-2"
2SI-1-ISI	12	Safety Injection Lines 2SI04A-12", 2SI04B-12", 2SI04C-8", and 2SIA4A-8"
2SI-1-ISI	13	Safety Injection Lines 2RC29AD-10" and 2SI09BD-10"

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
		SAFETY INJECTION SYSTEM (SI) [Continued]
2SI-1-ISI	14	Safety Injection Line 2SI05DD-6"
2SI-1-ISI	15	Safety Injection Lines 2SI08JC-1½" 2RC45AC-3", and 2RC30AC-1½"
2SI-1-ISI	16	Safety Injection Lines 2SI08JD-1½", 2RC45AD-3", and 2RC30AD-1½"
2SI-1-ISI	17	Safety Injection Lines 2SI08JB-1½", 2RC45AB-3", and 2RC30AB-1½"
2SI-1-ISI	18	Safety Injection Lines 2SI08HB-2", 2SI08GB-1½", and 2SI08JB-1½"
2SI-1-ISI	19	Safety Injection Lines 2SI08GA-1½", 2SI08HA-2", and 2SI08JA-1½"
2SI-1-ISI	20	Safety Injection Lines 2SI08GC-1½", 2SI08HC-2", 2SI08JC-1½", 2SI08GD-1½", 2SI08HD-2", and 2SI08JD-1½"
2SI-1-ISI	21	Safety Injection Line 2SI03DA-2"
2SI-1-ISI	22	Safety Injection Line 2SI03FB-2"
2SI-1-ISI	23	Safety Injection Lines 2SI18FA-2" and 2SI18FD-2", and Reactor Coolant Line 2RY76A-2"
2SI-1-ISI	24	Safety Injection Lines 2SI06BA-24" and 2SI06BB-24"
2SI-1-ISI	25	Safety Injection Line 2SI05AA-8"
2SI-1-ISI	26	Safety Injection Lines 2SI05BB-8", 2SI05CB-8", and 2SI05CC-8"
2SI-1-ISI	27	Safety Injection Line 2SI08JD-1½"
2SI-1-ISI	29	Safety Injection Line 2SI08JC-1½"
2SI-1-ISI	31	Safety Injection Lines 2SI08JA-1½", 2RC30AA-1½", and 2RC45AA-3"
2SI-1-ISI	32	Safety Injection Line 2SI05AB-8"
2SI-1-ISI	33	Safety Injection Line 2SI34A-8"
2SI-1-ISI	34	Safety Injection Line 2SI05CB-8"

TABLE 2.4-2
BYRON STATION UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS
(Continued)

DRAWING NUMBER	SHEET NUMBER	DRAWING TITLE
		ESSENTIAL SERVICE WATER SYSTEM
2SX-1-ISI	1	Essential Service Water Lines 2SX06BA-16", 2SX06CA-14", 2SX06DC-10", 2SX06EA-10", 2SX08AA-10", and 2SX08AC-10"
2SX-1-ISI	2	Essential Service Water Lines 2SX06DC-10", 2SX06EC-10", 2SX08AC-10", and 2SX08BC-10"
2SX-1-ISI	3	Essential Service Water Lines 2SX06EA-10", 2SX06FA-10", 2SX08AA-10", and 2SX08BA-10"
2SX-1-ISI	4	Essential Service Water Lines 2SX06BB-16", 2SX06CB-14", 2SX06EB-10", 2SX08AB-10", and 2SX08AD-10"
2SX-1-ISI	5	Essential Service Water Lines 2SX06DD-10", 2SX06ED-10", 2SX08AD-10", and 2SX08BD-10"
2SX-1-ISI	6	Essential Service Water Lines 2SX06EB-10", 2SX06FB-10", 2SX08AB-10", and 2SX08BB-10"
2SX-1-ISI	7	Essential Service Water Lines 2SX07CB-10", 2SX07EB-14", 2SX07FB-16", 2SX09CB-10", and 2SX09CD-10"
2SX-1-ISI	8	Essential Service Water Lines 2SX07BB-10", 2SX07CB-10", 2SX09BB-10", and 2SX09CB-10"
2SX-1-ISI	9	Essential Service Water Lines 2SX07BD-10", 2SX07CD-10", 2SX09BD-10", and 2SX09CD-10"
2SX-1-ISI	10	Essential Service Water Lines 2SX07CA-10", 2SX07EA-14", and 2SX07FA-16"
2SX-1-ISI	11	Essential Service Water Lines 2SX07BA-10", 2SX07CA-10", 2SX09BA-10", and 2SX09CA-10"
2SX-1-ISI	12	Essential Service Water Lines 2SX07BC-10", 2SX07CC-10", 2SX09BC-10", and 2SX09CC-10"
		PRIMARY CONTAINMENT PURGE (VQ)
2VQ-1-ISI	1	Primary Containment Purge Lines 2VQ03A-8", 2VQ04A-8", 2VQ05A-8", 2VQ01A-48", and 2VQ02A-48"

TABLE 2.4-3

BYRON STATION UNIT 1 CONTAINMENT ISI DRAWINGS

CISI DWG. NO.	CISI DRAWING TITLE
1-CISI-1000 SH.1	IWE COMPONENT ROLLOUT INSIDE CONTAINMENT LINER VIEW LOOKING OUT 0° TO 180° AZIMUTH
1-CISI-1000 SH.2	IWE COMPONENT ROLLOUT INSIDE CONTAINMENT LINER VIEW LOOKING OUT 180° TO 360° AZIMUTH
1-CISI-1000 SH. 3	IWE COMPONENT DRAWING INSIDE CONTAINMENT MAT PLAN VIEW - EL. 377' – 0"
1-CISI-1000 SH. 4	IWE COMPONENT DRAWING CONTAINMENT DOME LINER VIEW LOOKING UP
1-CISI-1000 SH. 5	IWE COMPONENT DETAIL RECIRC. SUMP A & B GUARD PIPE & BELLOWS ASSEMBLY
1-CISI-1000 SH. 6A	IWE COMPONENT DETAIL VALVE CONTAINMENT ASSEMBLY 1RH01SA & 1RH01SB
1-CISI-1000 SH 6B	IWE COMPONENT DETAIL VALVE CONTAINMENT ASSEMBLY 1RH01SA & 1RH01SB
1-CISI-1000 SH. 7A	IWE COMPONENT DETAIL FUEL TRANSFER TUBE PENENTRATION (P-98) REACTOR POOL AREA
1-CISI-1000 SH. 7B	IWE COMPONENT SECTIONS FUEL TRANSFER TUBE PENENTRATION (P-98) REACTOR POOL AREA
1-CISI-1000 SH. 9A	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
1-CISI-1000 SH. 9B	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
1-CISI-1000 SH. 9C	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
1-CISI-1000 SH. 9D	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
1-CISI-1000 SH. 10A	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
1-CISI-1000 SH. 10B	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
1-CISI-1000 SH. 10C	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
1-CISI-1000 SH. 10D	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK

TABLE 2.4-3
BYRON STATION UNIT 1 CONTAINMENT ISI DRAWINGS
(Continued)

CISI DWG. NO.	CISI DRAWING TITLE
1-CISI-1000 SH. 11	TYPICAL IWE COMPONENT SURFACE AND ATTACHMENT DETAILS
1-CISI-1000 SH. 12	TYPICAL PENETRATION DETAILS INSIDE CONTAINMENT CONFIGURATION No.'s 1, 2 & 3
1-CISI-1000 SH. 13	TYPICAL PENETRATION DETAILS INSIDE CONTAINMENT CONFIGURATION No.'s 4 & 5
1-CISI-1001, SH. A1	ISI IDENTIFIER FORMAT AND EXPLANATION
1-CISI-1001 SH. 1A THRU 1F	IWE COMPONENT INFORMATION TABLE PIPING PENETRATIONS
1-CISI-1001 SH. 1G THRU 1J	IWE COMPONENT INFORMATION TABLE ELECTRICAL PENETRATIONS
1-CISI-1001 SH. 1K	IWE COMPONENT INFORMATION TABLE INSTRUMENT PENETRATIONS
1-CISI-1001 SH. 1L THRU 1R	IWE COMPONENT INFORMATION TABLE MISCELLANEOUS COMPONENTS
1-CISI-1001 SH 2A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 1
1-CISI-1001 SH 2B	ELECTRICAL PENETRATION SECTION OUTSIDE CONTAINMENT CONFIGURATION No. 1
1-CISI-1001 SH 3A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 2
1-CISI-1001 SH 3B	ELECTRICAL PENETRATION SECTIONS OUTSIDE CONTAINMENT CONFIGURATION No. 2
1-CISI-1001 SH 4A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 3
1-CISI-1001 SH 4B	ELECTRICAL PENETRATION SECTIONS OUTSIDE CONTAINMENT CONFIGURATION No. 3
1-CISI-1001 SH 5A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 4
1-CISI-1001 SH 5B	ELECTRICAL PENETRATION SECTION OUTSIDE CONTAINMENT CONFIGURATION No. 4
1-CISI-1001 SH 6A	ELECTRICAL PENETRATION DETAILS PERSONNEL AIR LOCKS CONFIGURATION No. 5
1-CISI-1001 SH 6B	ELECTRICAL PENETRATION SECTION OUTSIDE CONTAINMENT CONFIGURATION No. 5
1-CISI-1001 SH. 7	INSTRUMENT PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 1, 2 & 3

TABLE 2.4-3
BYRON STATION UNIT 1 CONTAINMENT ISI DRAWINGS
(Continued)

CISI DWG. NO.	CISI DRAWING TITLE
1-CISI-1001 SH. 8	PIPING PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 1 & 2
1-CISI-1001 SH. 9	PIPING PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 3 & 4
1-CISI-1001 SH. 10	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 5
1-CISI-1001 SH. 11	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 6
1-CISI-1001 SH. 12	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 7
1-CISI-2000 SH. 1	IWL/IWE COMPONENT ROLLOUT OUTSIDE CONTAINMENT 0° TO 180° AZIMUTH
1-CISI-2000 SH. 2	IWL/IWE COMPONENT ROLLOUT OUTSIDE CONTAINMENT 180° TO 360° AZIMUTH
1-CISI-2000 SH. 3	IWL COMPONENT DRAWING CONTAINMENT DOME EXTERIOR PLAN VIEW
1-CISI-2000 SH. 4	IWL COMPONENT DRAWING TENDON GALLERY PLAN VIEW
1-CISI-2000 SH. 5	IWL COMPONENT DETAIL TENDON ANCHORAGE ASSEMBLY
1-CISI-2000 SH. 6	IWL COMPONENT DRAWING DOME TENDON LAYOUT

TABLE 2.4-4
BYRON STATION UNIT 2 CONTAINMENT ISI DRAWINGS

CISI DWG. NO.	CISI DRAWING TITLE
2-CISI-1000 SH.1	IWE COMPONENT ROLLOUT INSIDE CONTAINMENT LINER VIEW LOOKING OUT 0° TO 180° AZIMUTH
2-CISI-1000 SH.2	IWE COMPONENT ROLLOUT INSIDE CONTAINMENT LINER VIEW LOOKING OUT 180° TO 360° AZIMUTH
2-CISI-1000 SH. 3	IWE COMPONENT DRAWING INSIDE CONTAINMENT MAT PLAN VIEW - EL. 377' - 0"
2-CISI-1000 SH. 4	IWE COMPONENT DRAWING CONTAINMENT DOME LINER VIEW LOOKING UP
2-CISI-1000 SH. 5	IWE COMPONENT DETAIL RECIRC. SUMP A & B GUARD PIPE & BELLOWS ASSEMBLY
2-CISI-1000 SH. 6A	IWE COMPONENT DETAIL VALVE CONTAINMENT ASSEMBLY 2RH01SA & 2RH01SB
2-CISI-1000 SH 6B.	IWE COMPONENT DETAIL VALVE CONTAINMENT ASSEMBLY 2RH01SA & 2RH01SB
2-CISI-1000 SH. 7A	IWE COMPONENT DETAIL FUEL TRANSFER TUBE PENENTRATION (P-98) REACTOR POOL AREA
2-CISI-1000 SH. 7B	IWE COMPONENT SECTIONS FUEL TRANSFER TUBE PENENTRATION (P-98) REACTOR POOL AREA
2-CISI-1000 SH. 9A	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
2-CISI-1000 SH. 9B	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
2-CISI-1000 SH. 9C	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
2-CISI-1000 SH. 9D	IWE COMPONENT DETAIL EQUIPMENT HATCH/PERSONNEL AIR LOCK
2-CISI-1000 SH. 10A	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
2-CISI-1000 SH. 10B	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
2-CISI-1000 SH. 10C	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
2-CISI-1000 SH. 10D	IWE COMPONENT DETAIL EMERGENCY PERSONNEL AIR LOCK
2-CISI-1000 SH. 11	TYPICAL IWE COMPONENT SURFACE AND ATTACHMENT DETAILS
2-CISI-1000 SH. 12	TYPICAL PENETRATION DETAILS INSIDE CONTAINMENT CONFIGURATION No.'s 1, 2 & 3
2-CISI-1000 SH. 13	TYPICAL PENETRATION DETAILS INSIDE CONTAINMENT CONFIGURATION No.'s 4 & 5
2-CISI-1001, SH. A1	ISI IDENTIFIER FORMAT AND EXPLANATION
2-CISI-1001 SH. 1A THRU 1F	IWE COMPONENT INFORMATION TABLE PIPING PENETRATIONS
2-CISI-1001 SH. 1G THRU 1P	IWE COMPONENT INFORMATION TABLE ELECTRICAL PENETRATIONS

TABLE 2.4-4
BYRON STATION UNIT 2 CONTAINMENT ISI DRAWINGS
(Continued)

CISI DWG. NO.	CISI DRAWING TITLE
2-CISI-1001 SH. 1Q	IWE COMPONENT INFORMATION TABLE INSTRUMENT PENETRATIONS
2-CISI-1001 SH. 1R THRU 1W	IWE COMPONENT INFORMATION TABLE MISCELLANEOUS COMPONENTS
2-CISI-1001 SH 2A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 1
2-CISI-1001 SH 2B	ELECT. PENETRATION SECTIONS OUTSIDE CONTAINMENT CONFIGURATION No. 1
2-CISI-1001 SH 3A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 2
2-CISI-1001 SH 3B	ELECT. PENETRATION SECTIONS OUTSIDE CONTAINMENT CONFIGURATION No. 2
2-CISI-1001 SH 4	ELECTRICAL PENETRATION DETAILS PERSONNEL AIR LOCKS CONFIGURATION No. 3
2-CISI-1001 SH 5A	ELECTRICAL PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No. 4
2-CISI-1001 SH 5B	ELECT. PENETRATION SECTIONS OUTSIDE CONTAINMENT CONFIGURATION No. 4
2-CISI-1001 SH. 6	INSTRUMENT PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 1, 2 & 3
2-CISI-1001 SH. 7	PIPING PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 1 & 2
2-CISI-1001 SH. 8	PIPING PENETRATION DETAILS OUTSIDE CONTAINMENT CONFIGURATION No's 3 & 4
2-CISI-1001 SH. 9	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 5
2-CISI-1001 SH. 10	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 6
2-CISI-1001 SH. 11	PIPING PENETRATION DETAIL OUTSIDE CONTAINMENT CONFIGURATION No. 7
2-CISI-2000 SH. 1	IWL/IWE COMPONENT ROLLOUT OUTSIDE CONTAINMENT 0° TO 180° AZIMUTH
2-CISI-2000 SH. 2	IWL/IWE COMPONENT ROLLOUT OUTSIDE CONTAINMENT 180° TO 360° AZIMUTH
2-CISI-2000 SH. 3	IWL COMPONENT DRAWING CONTAINMENT DOME EXTERIOR PLAN VIEW
2-CISI-2000 SH. 4	IWL COMPONENT DRAWING TENDON GALLERY PLAN VIEW
2-CISI-2000 SH. 5	IWL COMPONENT DETAIL TENDON ANCHORAGE ASSEMBLY
2-CISI-2000 SH. 6	IWL COMPONENT DRAWING DOME TENDON LAYOUT

2.5 TECHNICAL APPROACH AND POSITIONS

When the requirements of ASME Section XI are not easily interpreted, Byron Station has reviewed general licensing/regulatory requirements and industry practice to determine a practical method of implementing the Code requirements. The technical approach and position (TA&P) documents contained in this section have been provided to clarify Byron Station's implementation of ASME Section XI requirements. An index which summarizes each technical approach and position is included in Table 2.5-1. This section is reserved for Site Specific issues. Corporate Policy statements will be tracked and maintained by the Corporate Staff.

TABLE 2.5-1
TECHNICAL APPROACH AND POSITIONS INDEX

POSITION NUMBER	REVISION/ DATE	STATUS[1]	DESCRIPTION OF TECHNICAL APPROACH
I3T-01	0 9/12/05	Active	**(ISI)** RISI examination volumes and methods.
I3T-02	0 9/12/05	Active	**(ISI)** Determination of additional examinations per Code Case N-578-1 Paragraph -2430.
I3T-03	0 9/12/05	Active	**(SPT)** Hydrostatic and operational pressure testing of open ended piping.
I3T-04	0 9/12/05	Active	**(SPT)** Valve seats as pressurization boundaries.

Note 1: Technical Approach and Position Status Options: Active – Current ISI Program Technical Approach is being utilized at Byron Station; Deleted – Technical Approach is no longer being utilized at Byron Station

TECHNICAL APPROACH AND POSITION NUMBER: I3T-01
REVISION 0
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COMPONENT IDENTIFICATION

Code Class:	1 and 2
Reference:	Byron Station Request for Relief I3R-02, *Alternative to the ASME Section XI Requirements for Class 1 and Class 2 Piping Welds* Executive Summary, Risk Informed Inservice Inspection Program Plan Byron Nuclear Power Station Units 1 and 2 ASME Code Case N-578-1: *Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B Section XI, Division 1* Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*
Examination Category:	Previously B-F, B-J, C-F-1, and C-F-2 now incorporated into R-A
Description:	RISI examination volumes and methods

CODE REQUIREMENT

The requirements for examination methods and areas/volumes are assembled from several sources other than the station's base edition of the ASME Code.

Relief Request I3R-02:

For this application, the guidance for the examination volume for a given degradation mechanism is provided by the EPRI Topical Report while the guidance for the examination method is provided by Code Case N-578-1.

Executive Summary, Section 3.5 *Inspection Location Selection and NDE Selection*:

Code Case N-578-1 Table 1, "Examination Category R-A, "Risk-Informed Piping Examinations" will also be used in conjunction with Table 4-1 of EPRI TR-112657 to categorize the parts examined under the RISI Program. Code Case N-578-1 Table 1 provides examination requirements, examination method, acceptance standards, examination extent and frequency for piping structural elements not subject to a damage mechanism.

Code Case N-578-1, Section I-5.2 *Examination Volumes and Methods*:

Examination programs developed in accordance with this Case shall use NDE techniques suitable for specific degradation mechanisms and examination locations. The examination volumes and methods that are appropriate for each degradation mechanism are provided in Table 1 of this Case. The methods and procedures used for the examinations shall be qualified to reliably detect and size the relevant degradation mechanisms identified for each elements.

TR-112657, Section 4 *Mechanism Specific Examination Volumes and Methods*:

Application of RISI uses NDE techniques that are designed to be effective for specific degradation mechanisms and examination locations. This inspection for cause approach involves identification of specific damage mechanisms that are likely to be operative, the location where they may be operative, and the appropriate examination methods and volumes specific to address the damage mechanism. ...

TECHNICAL APPROACH AND POSITION NUMBER: I3T-01
REVISION 0
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POSITION

Table I3T-01-1: Degradation Mechanisms with Examination Methods and Volumes

DEGRADATION MECHANISM (DM) OR COMPONENT TYPE	N-578-1 TABLE 1 EXAM METHOD	TR-112657 TABLE 4-1 EXAM VOLUME OR AREA	COMMENTS
Thermal Fatigue	Volumetric	Figure 4-1 thru 4-4	Includes expanded exam volume for piping. See Note[5].
High Cycle Mechanical Fatigue	Visual, VT-2	Not Applicable, Note[1]	None currently identified at station.
Erosion Cavitation	Volumetric	Figure 4-16 thru 4-22	In accordance w/ FAC Program
Crevice Corrosion Cracking	Volumetric	Figure 4-6 and 4-7	None currently identified at station.
Primary Water Stress Corrosion Cracking	See Note[2]	See Note[2]	See Note[2]
Intergranular or Transgranular Stress Corrosion Cracking	Volumetric	Figure 4-10 thru 4-14	Effected components not subject to an additional DM. Only SCC type examinations required for components.
Microbiologically Corrosion	Volumetric	Figure 4-15	See Note[3]
Flow Accelerated Corrosion	Volumetric	Figure 4-16 thru 4-22	In accordance w/ FAC Program
External Chloride Stress Corrosion Cracking	Surface	Affected Surface	None currently identified at station.
No Damage Mechanism	Volumetric	Figure 4-1 IWB-2500-8(c) IWB-2500-9, 10, 11 IWC-2500-7(a) See Notes[4,5,6]	Includes expanded exam volume for piping. See Notes[4,5,6]
Socket Welds (All DM)	Visual, VT-2	Not Applicable, Note[1]	See Note[1]

Note 1: VT-2 examinations are performed during each refueling cycle. VT-2 examination area is not identified in Code Case N-578-1 or TR-112657 (TR-RISI). Socket welds are not specifically addressed in TR-RISI with the exception of FAC exams. N-578-1 Table 1 Note 12 specifies that socket welds require only a VT-2 exam.

Note 2: N-578-1 requires a VT-2 examination for this DM while TR-112657 requires a volumetric or visual method. Recent industry events necessitated the change to volumetric examination techniques (where qualified examination techniques are available) for detection prior to through-wall leakage. TR-RISI identifies Figures 4-8 and 4-9 for the required examination volumes based on component configuration. Figure 4-8 would not be applicable to components incorporated into RISI. At Byron Station, all components subject to PWSCC (12 in each unit) are classified as High-Risk Group, Risk Category 2. Joint configuration may result in obtained examination coverage of less than the percentage required by adopted Code Case N-460. Due to the significance of these components, credit for these examinations will be taken and a Request for Relief will be submitted as described in TR-RISI Section 6.4.

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Note 3: DM currently limited to SX system components. These components have been removed from the RISI inspection population and default by incorporation into the Service Water Inspection program.

Note 4: Examination of components without an identified DM is not addressed in TR-RISI. Code Case N-578-1 requires that these components receive the same examination as components subject to thermal fatigue. For no DM components, the examination requirements of N-578-1 will be used.

Note 5: For piping butt welds with no DM, the length for the examination volume shall be increased to include ½" beyond each side of the detectable base metal thickness transition or counterbore. For components without a detectable base metal thickness transition or counterbore, the basic examination volume specified in TR-RISI Figure 4-1 shall be used. The figure applicable for use shall be based on the detectable presence of a counterbore regardless of the pipe size.

Note 6: For branch connection piping without a DM, the examination volume shall be determined using the figures specified in N-578-1 (IWB-2500-9, 10, 11 of the 1989 Edition).

TECHNICAL APPROACH AND POSITION NUMBER: I3T-02
REVISION 0
(Page 1 of 3)

COMPONENT IDENTIFICATION

Code Class:	1, 2, and 3
Reference:	Byron Station Request for Relief I3R-02 ASME Code Case N-578-1: *Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B Section XI, Division 1*
Examination Category:	Previously B-F, B-J, C-F-1, and C-F-2 now incorporated into R-A
Description:	Determination of Additional Examinations per Code Case N-578-1 Paragraph –2430

CODE REQUIREMENT

-2430 Additional Examinations

(a) Examinations performed in accordance with -2500 that reveal flaws or relevant conditions exceeding the acceptance standards of -3000 shall be extended to include additional examinations. The additional examinations shall include piping structural elements described in Table 1 with the same postulated failure mode and the same or higher failure potential.

(1) The number of additional elements shall be the number of piping structural elements with the same postulated failure mode originally scheduled for that fuel cycle.

(2) The scope of the additional examinations may be limited to those High-Safety-Significant (HSS) piping structural elements within systems, whose materials and service conditions are determined by an evaluation to have the same postulated failure mode as the piping structural element that contained the original flaw or relevant condition.

(b) If the additional examinations required by -2430(a) reveal flaws or relevant conditions exceeding the acceptance standards of -3000, the examination shall be further extended to include additional examinations.

(1) These examinations shall include all remaining piping elements within Table 1 whose postulated failure modes are the same as the piping structural elements originally examined in -2430(a)

(2) An evaluation shall be performed to establish when those examinations are to be conducted. The evaluation must consider failure mode and potential.

(c) For the inspection period following the period in which the examinations of -2430(a) or (b) were completed, the examinations shall be performed as originally scheduled in accordance with -2400.

Underlined portions of the requirements of the code case identify issues addressed in this technical approach.

TECHNICAL APPROACH AND POSITION NUMBER: I3T-02
REVISION 0
(Page 2 of 3)

POSITION

Table I3T-02-1: System Distribution in N-578-1 Risk Matrix Categories containing Byron Station Unit 1 and 2 Welds

N-578-1 TABLE I-8		CONSEQUENCE CATEGORY		
		LOW	MEDIUM	HIGH
FAILURE POTENTIAL	HIGH	CATEGORY 5(H)	CATEGORY 3	CATEGORY 1 FW (AF, FW, MS)[1]
	MEDIUM		CATEGORY 5(M) CV SI	CATEGORY 2 AF, RC, RY (SX)[3]
	LOW			CATEGORY 4 AF, CS CV FW MS (RC, RH)[2] RY SD SI
RISK GROUPS		MEDIUM – CAT 4 & 5	HIGH – CAT 1, 2, & 3	

Note 1: AF/FW/MS welds exempted from RISI due to single DM (FAC) by incorporation into station FAC program.

Note 2: 1RH and 1RC system welds limited to Unit 1.

Note 3: SX welds removed from RISI and default into Service Water Inspection program.

Table I3T-02-2: Distribution of Degradation Mechanisms, HSS Piping Systems, and Risk Categories

UNIT 1			APPLICABLE CONSEQUENCE CATEGORIES																
			LOW			MEDIUM				HIGH									
			RC	RH	SI	CV	RC	RH	SI	AF	CS	CV	FW	MS	RC	RH	RY	SD	SI	
FAILURE POTENTIAL	H	R1.11											127							127
		R1.18											127							127
	M	R1.11	-	-	-	153	1		254	20					166		35			629
		R1.15	-	-	-										8		6			14
		R1.16	-	-	-		2								2					4
	L	R1.20	-	-	-	-	-	-	-	87	172	192		178	408	200	84	4	267	1592
TOTALS			0	0	0	153	3	0	254	107	172	192	254	178	584	200	125	4	267	

UNIT 2			APPLICABLE CONSEQUENCE CATEGORIES																
			LOW			MEDIUM				HIGH									
			RC	RH	SI	CV	RC	RH	SI	AF	CS	CV	FW	MS	RC	RH	RY	SD	SI	
FAILURE POTENTIAL	H	R1.11											242							242
		R1.18											242							242
	M	R1.11	-	-	-	150	1		253	20					160		30			614
		R1.15	-	-	-										8		6			14
		R1.16	-	-	-		2													2
	L	R1.20	-	-	-	-	-	-	-	88	164	200		169	377	215	84	243		1540
TOTALS			0	0	0	150	3	0	253	108	164	200	484	169	545	215	120	243		

Note: Identifies entire population of DM. Individual welds may be counted more than once due to multiple DM present.

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Paragraph -2430(a): Additional Examination Selection Criteria by Failure Potential of Rejected Component

CATEGORY 1: Selections remain within Category 1.

CATEGORY 5: Selections may be taken from Categories 5(M) and 2

CATEGORY 2: Selections may be taken from Categories 5(M) and 2.

CATEGORY 4: Selections may be taken from Categories 1, 4, 5(M), and 2.

Paragraph -2430(a)(1): Additional Examination Selection Criteria by Failure Mode of Rejected Component

Criteria of additional selection is based upon the item number classification shown in N-578-1 Table 1. Additional selections are not restricted by the Risk Category of the rejected component.

Paragraph -2430(a)(2): Limitation of the Scope of Additional Examinations

Populations subject to the additional examinations may be limited to those components with the same material and service condition as the rejected component. The required number of additional examinations is not reduced by this limitation. High-Safety-Significant piping structural elements are identified as those components included in Risk Categories 1, 2, 3, 4, and 5.

Paragraph -2430(b)(1): Second Expansion Scope of Additional Examinations

The second population subject is limited to the failure mode (degradation mechanism) of the original component. All HSS components of the same item number, regardless of Risk Category, are subject to this expansion.

Paragraph -2430(b)(2): Scheduling of the Second Expansion Scope

The second expansion selections need not be entirely examined in the current refueling cycle. The sequence and schedule of the additional examinations will be determined based on the failed component features.

Paragraph -2430(c): Return to Original Schedule of Component Selection and Examination

In the initial expansion population, credit may be taken for examinations performed on components scheduled later in the same Inspection Period (i.e., the initial expansion may include components scheduled for the next refueling outage). The scheduling of components with other degradation mechanisms is not effected by the additional examination scope(s).

TECHNICAL APPROACH AND POSITION NUMBER: I3T-03
REVISION 0
(Page 1 of 1)

COMPONENT IDENTIFICATION

Code Class:	2 and 3
Reference:	IWA-5244(b)(2)
Examination Category:	C-H, D-B
Item Number:	C7.10, D2.10
Description:	System Leakage Testing of Non-Isolable Buried Components.
Component Number:	Non-Isolable Buried Pressure Retaining Components

CODE REQUIREMENT

IWA-5244(b)(2) requires non-isolable buried components be tested to confirm that flow during operation is not impaired.

POSITION

Article IWA-5000 provides no guidance in setting acceptance criteria for what can be considered "adequate flow". In lieu of any formal guidance provided by the Code, Byron Station has established the following acceptance criteria:

- For opened ended lines on systems that require Inservice Testing (IST) of pumps, adherence to IST acceptance criteria is considered as reasonable proof of adequate flow through the lines.

- For lines in which the open end is accessible to visual examination while the system is in operation, visual evidence of flow discharging the line is considered as reasonable proof of adequate flow through the open ended line.

- For open ended portions of systems where the process fluid is pneumatic, evidence of gaseous discharge shall be considered reasonable proof of adequate flow through the open ended line. Such test may include passing smoke through the line, hanging balloons or streamers, using a remotely operated blimp, using thermography to detect hot air, etc.

This acceptance criteria will be utilized in order to meet the requirements of IWA-5244(b)(2).

Byron Station's position is that proof of adequate flow is all that is required for testing these open ended lines and that no further visual examination is necessary. This is consistent with the requirements for buried piping, which is not subject to visual examination.

TECHNICAL APPROACH AND POSITION NUMBER: I3T-04
REVISION 0
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COMPONENT IDENTIFICATION

Code Class:	1, 2, and 3
Reference:	IWA-5221
	IWA-5222
Examination Category:	B-P, C-H, D-B
Item Number:	B15.10, C7.10, D2.10
Description:	Valve Seats as Pressurization Boundaries.
Component Number:	All Pressure Testing Boundary Valves

CODE REQUIREMENT

IWA-5221 requires the pressurization boundary for system leakage testing extend to those pressure retaining components under operating pressures during normal system service.

POSITION

Byron Station's position is that the pressurization boundary extends up to the valve seat of the valve utilized for isolation. For example, in order to pressure test the Class 1 components, the valve that provides the Class break would be utilized as the isolation point. In this case the true pressurization boundary, and Class break, is actually at the valve seat.

Any requirement to test beyond the valve seat is dependent only on whether or not the piping on the other side of the valve seat is ISI Class 1, 2, or 3.

In order to simplify examination of classed components, Byron Station will perform a VT-2 visual examination of the entire boundary valve body and bonnet (during pressurization up to the valve seat).

3.0 WELDS AND COMPONENTS ISI PLAN

The Byron Station Welds and Components ISI Plan includes ASME Section XI nonexempt pressure retaining welds, piping structural elements, pressure retaining bolting, attachment welds, pump casings, valve bodies, reactor vessel interior, reactor vessel welded core support structures, reactor vessel interior attachments, reactor vessel removable core support structures, and steam generator tubing of ISI Class 1, 2, and 3 components that meet the criteria of IWA-1300. These components are identified on the ISI CBD's listed in Section 2.3, Tables 2.3-1 and 2.3-2. Procedure ER-AA-330-002, "Inservice Inspection of Welds and Components," implements the ASME Section XI Welds and Components ISI Plan. This ISI Program Plan also includes component augmented inservice inspection examinations specified by documents other than ASME Section XI.

3.1 BYRON STATION NONEXEMPT ISI CLASS COMPONENTS

The Byron Station ISI Class 1 components subject to examination are those that are not exempted under the criteria of Subarticle IWB-1220in the 1989 Edition, No Addenda of ASME Section XI (see Section 3.1.2 below). The Byron Station ISI Class 2 and 3 components identified in ISI CBD's are those not exempted under the criteria of Subarticles IWC-1220 and Subarticle IWD-1220 in the 2001 Edition through the 2003 Addenda of ASME Section XI. A summary of Byron Station Units 1, 2, and 0 (Common) ASME Section XI nonexempt components is included in Section 7.0.

3.1.1 Identification of ISI Class 1, 2, and 3 Nonexempt Components

ISI Class 1, 2, and 3 components are identified on the ISI Isometric and Component Drawings listed in Section 2.4, Tables 2.4-1 and 2.4-2. Welded attachments are also identified by controlled Byron Station support drawings.

3.1.2

10 CFR 50.55a(b)(2)(xi) specifies that the 1989 Edition, No Addenda of ASME Section XI, Subarticle IWB-1220 shall be used in lieu of the 2001 Edition through the 2003 Addenda of ASME Section XI, Subarticle IWB-1220.

IWB-1220, Components Exempt from Examination (1989 Edition, No Addenda) - The following components (or parts of components) are exempted from the volumetric and surface examination requirements of IWB-2500 per the Code paragraph referenced:

(a) [IWB-1220(a) is not utilized at Byron Station]

(b)(1) piping of NPS 1 and smaller, except for steam generator tubing;

(b)(2) components and their connections in piping of NPS 1 and smaller;

(c) [IWB-1220(c) is not utilized at Byron Station]

3.2 RISK-INFORMED EXAMINATION REQUIREMENTS

Piping structural elements that fall under RISI Category R-A are risk ranked as High (1, 2, and 3), Medium (4 and 5), and Low (6 and 7). Per the EPRI Topical Reports TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1, piping structural elements ranked as High or Medium Risk are subject to examination while piping structural elements ranked as Low Risk are not subject to examinations (except for pressure testing). Thin wall welds that were excluded from volumetric examination under ASME Section XI rules per Table IWC-2500-1 are included in the element scope that is potentially subject to RISI examination at Byron Station.

Piping structural elements may be excluded from examination (other than pressure testing) under the RISI Program if the only degradation mechanism present for a given location is inspected for under certain other station programs such as the Flow Accelerated Corrosion (FAC) or Microbiologically Induced Corrosion (MIC) Programs. These piping structural elements will remain part of the FAC or Service Water programs that already perform "for cause" inspections to detect these degradation mechanisms. Piping structural elements susceptible to FAC or MIC and pitting along with another degradation mechanism (e.g., thermal fatigue) are retained as part of the RISI scope and are included in the element selection for the purpose of performing exams to detect the additional degradation mechanism. The RISI Program element examinations are performed in accordance with Relief Request I3R-02.

4.0 SUPPORT ISI PLAN

The Byron Station Support ISI Plan includes the supports of ASME Section XI nonexempt ISI Class 1, 2, and 3 components as described in Section 3.0. Procedure ER-AA-330-003, "Visual Examination of Section XI Component Supports," implements the ASME Section XI Support ISI Plan.

4.1 BYRON STATION NONEXEMPT ISI CLASS SUPPORTS

The Byron Station ISI Class 1, 2, and 3 nonexempt supports are those which do not meet the criteria of Subarticle IWF-1230 of ASME Section XI. A summary of the Byron Station Units 1, 2, and 0 (Common) ASME Section XI nonexempt supports is included in Section 7.0.

4.1.1 Identification of ISI Class 1, 2, and 3 Nonexempt Supports

ISI Class 1, 2, and 3 supports are identified on the ISI Isometrics and Component Drawings listed in Section 2.4, Tables 2.4-1 and 2.4-2. Supports are also identified by controlled Byron Station support drawings.

4.2 SNUBBER EXAMINATION AND TESTING REQUIREMENTS

4.2.1 ASME Section XI Paragraphs IWF-5200(a) and (b) and IWF-5300(a) and (b) require VT-3 Visual Examination and Inservice Tests of snubbers to be performed in accordance with the Operation and Maintenance of Nuclear Power Plants (OM), Standard ASME/ANSI OM, Part 4. As allowed by 10 CFR 50.55a(b)(3)(v), Byron Station will use Subsection ISTD, "Inservice Testing of Dynamic Restraints (Snubbers) In Light Water Reactor Power Plants," ASME OM Code, 2001 Edition through the 2003 Addenda, to meet the requirements in ASME Section XI Paragraphs IWF-5200(a) and (b) and IWF-5300(a) and (b). A summary of the Byron Station Units 1, 2, and 0 (Common) safety-related and important to safety snubbers is included in Section 7.0.

Corporate procedure ER-AA-330-004, "Visual Examination of Technical Specification Snubbers", implements the visual inspection program for safety related and important to safety snubbers. Corporate procedures ER-AA-330-010, "Administration of Snubber Functional Testing", ER-AA-330-011, "Snubber Service Life Monitoring Program", and Station procedures BVP 200-6, 1/2BVSR 7.B-2, and 1/2BVSR 7.B-3 are used to implement the functional testing and service life monitoring requirements for safety-related and important to safety snubbers.

The ASME Section XI ISI Program uses Subsection IWF to define support inspection requirements. The ISI Program maintains the Code Class snubbers in the populations subject to inspection per Subsection IWF. This is done to accommodate scheduling and inspection requirements (such as insulation removal) of the related attachment hardware per Paragraphs IWF-5200(c) and IWF-5300(c). (See Section 4.2.2 below.)

4.2.2 ASME Section XI Paragraphs IWF-5200(c) and IWF-5300(c) require integral and non-integral attachments for snubbers to be examined in accordance with Subsection IWF

of the Code. This results in VT-3 visual examination of the snubber attachment hardware including lugs, bolting, pins, and clamps.

The ASME Section XI ISI Program uses Subsection IWF to define the inspection requirements for all Class 1, Class 2, and Class 3 supports, regardless of type. The ISI Program maintains the Code Class snubbers in the support populations subject to inspection per Subsection IWF. This is done to facilitate scheduling, preparation including insulation removal, and inspection requirements of the snubber attachment hardware (e.g., lugs, bolting, pins, and clamps) per IWF-5200(c) and IWF-5300(c).

5.0 SYSTEM PRESSURE TESTING ISI PLAN

The Byron Station System Pressure Testing (SPT) ISI Plan includes all pressure retaining ASME Section XI, ISI Class 1, 2, and 3 components, with the exception of those specifically exempted by Paragraphs IWC-5222(b) and IWD-5240(b). All RISI piping structural elements, regardless of risk classification, remain subject to pressure testing as part of the current ASME Section XI program.

The SPT ISI Plan performs system pressure tests and visual inspections on the ISI Class 1, 2, and 3 pressure retaining components to verify system and component structural integrity. This program conducts both Periodic and Interval (10-year frequency) pressure tests as defined in ASME Section XI Inspection Program B. Procedure ER-AA-330-001, "Section XI Pressure Testing," implements the ASME Section XI System Pressure Testing ISI Plan. In addition to the ASME Section XI requirements, Byron Station's SPT ISI Plan also includes augmented examination commitments.

5.1 BYRON STATION NONEXEMPT ISI CLASSED SYSTEMS

All Class 1 pressure retaining components, typically defined as the reactor coolant pressure boundary, are required to be tested. Those portions of Class 2 and 3 systems that are required to be tested include the pressure retaining boundaries of components required to operate or support the system safety functions. Class 2 and 3 open ended discharge piping and components are excluded from the examination requirements per IWC-5222(b) and IWD-5240(b).

5.1.1 Identification of Class 1, 2, and 3 Components

All components subject to ASME Section XI System Pressure Testing and augmented pressure testing are shown on the color coded ISI CBD's listed in Section 2.3, Tables 2.3-1 and 2.3-2.

5.1.2 Identification of System Pressure Tests

The System Pressure Test Boundary Drawings used to define which systems, or portions of systems, fall under a specific test are also shown on the color coded ISI CBD's listed in Section 2.3, Tables 2.3-1 and 2.3-2.

5.2 RISK-INFORMED EXAMINATIONS OF SOCKET WELDS

Socket welds selected for examination under the RISI Program are to be inspected with a VT-2 exam each refueling outage per ASME Code Case N-578-1 (see footnote 12 in Table 1 of the Code Case). To facilitate this, socket welds selected for inspection under the RISI Program shall be pressurized each refueling outage in accordance with Paragraph IWA-5211(a).

6.0 CONTAINMENT ISI PLAN

6.1 INTRODUCTION

The Byron Station Containment ISI Plan includes ASME Section XI ISI Class MC pressure retaining components and their integral attachments, and Class CC components and post-tensioning systems that meet the criteria of Subarticle IWA-1300. These components are identified on the CISI Drawings listed in Section 2.4, Table 2.4-3 and 2.4-4. This Containment ISI Plan also includes information related to augmented examination areas, component accessibility, and examination review. The CISI Program component examinations are performed in accordance with Relief Request I3R-01.

The inspection of containment structures, components, and post-tensioning systems are performed per:

1. ER-AA-330-005, "Visual Examination of Section XI Class CC Concrete Containment Structures"

2. ER-AA-330-006, "Inservice Inspection and Testing of the Pre-Stresses Concrete Containment Post Tensioning Systems"

3. ER-AA-330-007, "Visual Examination of Section XI Class MC Surfaces and Class CC Liners"

6.2 CLASS MC AND CC COMPONENTS

The Byron Station ISI Class MC and CC components identified on the CISI Drawings are those not exempted under the criteria of Subarticles IWE-1220 and Subarticle IWL-1220 in the 2001 Edition through the 2003 Addenda of ASME Section XI. A summary of Byron Station Units 1 and 2 ASME Section XI nonexempt CISI components is included in Section 7.0.

The process for scoping Byron Station components for inclusion in the CISI Plan is included in the containment sections of the ISI Classification Basis Document. These sections include a listing and detailed basis for inclusion of containment components.

Components that are classified as Class MC and CC must meet the requirements of ASME Section XI in accordance with 10 CFR 50.55a(g)(4). Supports of IWE components are not required to be examined in accordance with 10 CFR 50.55a(g)(4).

6.2.1 Identification of ISI Class MC and CC Nonexempt Components

ISI Class MC and CC components are identified on the CISI Drawings listed in Section 2.4, Tables 2.4-3 and 2.4-4.

6.2.2 Identification of ISI Class MC and CC Exempt Components

The process for exempting Byron Station components from the CISI Plan per IWE-1220 and IWL-1220 is included in the containment sections of the ISI Classification Basis Document. These sections include discussions of exempt components and the bases for those exemptions.

6.3 AUGMENTED EXAMINATIONS AREAS

Metal containment components potentially subject to augmented examination per IWE-1240 have been evaluated in the containment sections of the ISI Classification Basis Document. These sections define the areas that are subjected to augmented examination.

Similarly, concrete surfaces may be subject to Detailed Visual examination in accordance with IWL-2310, if declared to be 'Suspect Areas' by the examiner or the Responsible Engineer.

No significant conditions are currently identified in the Second CISI Interval as requiring application of additional augmented examination requirements under IWE-1240.

6.4 COMPONENT ACCESSIBILITY

Class MC pressure retaining components subject to examination shall remain accessible for either direct or remote visual examination from at least one side per the requirements of ASME Section XI, Subarticle IWE-1230.

6.5 RESPONSIBLE INDIVIDUAL AND ENGINEER

ASME Section XI Subsection IWE requires the Responsible Individual to be involved in the development, performance, and review of the CISI examinations. The Responsible Individual shall meet the requirements of ASME Section XI, Subarticle IWE-2320.

ASME Section XI Subsection IWL requires the Responsible Engineer to be involved in the development, approval, and review of the CISI examinations. The Responsible Engineer shall meet the requirements of ASME Section XI, Subarticle IWL-2320.

7.0 COMPONENT SUMMARY TABLES

7.1 INSERVICE INSPECTION SUMMARY TABLES

The following Tables 7.1-1 and 7.1-2 provide a summary of the ASME Section XI component, support, system pressure testing, and augmented examinations and tests for the Third Inspection Interval at Byron Station Units 1, 2, and 0 (Common). If a particular Category and Item Number do not apply to Byron Station, they are not included in these tables.

The format of the Inservice Inspection Summary Tables is as depicted below and provides the following information:

EXAMINATION CATEGORY (WITH CATEGORY DESCRIPTION)	ITEM NUMBER (OR RISK CATEGORY OR AUGMENTED NUMBER)	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Examination Category and Examination Category Description:

Provides the examination category and description as identified in ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, IWE-2500-1, IWF-2500-1, and IWL-2500-1.

Examination Category "R-A" from Code Case N-578-1 is used in lieu of ASME Section XI Categories B-F, B-J, C-F-1, and C-F-2 to identify Class 1 and 2 piping structural elements for the RISI program. Only those examination categories applicable to Byron Station are identified.

In addition to the ASME Section XI Categories, Category "N/A" is used to identify Augmented ISI examinations and other Byron Station commitments.

(2) Item Number (or Risk Category Number OR Augmented Number):

Provides the item number as identified in ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, IWE-2500-1, IWF-2500-1, and IWL-2500-1. Only those item numbers applicable to Byron Station are identified.

For piping structural elements under the RISI Program, the Risk Category Number (e.g., 1-5) is used in place of the Item Number.

In addition to the ASME Section XI Item Numbers, Item Numbers RG1.14, ECCS, 0737, and GL8805 are used to identify Augmented ISI examinations and other Byron Station commitments.

(3) Item Number Description:

Provides the description as identified in ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, and IWF-2500-1.

In addition to the ASME Section XI Item Numbers, a description of the Risk Categories for Class 1 and 2 piping structural elements is provided for the RISI Program.

For Augmented ISI examination commitments, a description of the Augmented requirement is provided.

(4) Exam Requirements:

Provides the examination methods required by ASME Section XI, Tables IWB-2500-1, IWC-2500-1, IWD-2500-1, IWE-2500-1, IWF-2500-1, and IWL-2500-1.

Provides the examination requirements for augmented components from Byron Station commitments or relief requests.

Provides the examination requirements for piping structural elements under the RISI Program are in accordance with the EPRI Topical Reports TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1.

(5) Total Number by System:

Provides the system designator (abbreviations). See Section 2.3, Tables 2.3-1 and 2.3-2 for a list of these systems.

This column also provides the number of components within a particular system for that Item Number, Risk Category Number, or Augmented Number.

Note that the total number of components by system are subject to change after completion of plant modifications, design changes, and ISI system classification updates.

(6) Relief Request/TA&P Number:

Provides a listing of Relief Request/TA&P numbers applicable to specific components the ASME Section XI Item Number, Risk Category Number, or Augmented Number. Relief requests that generically apply to all components, or an entire class are not listed. If a Relief Request/TA&P Number is identified, see the corresponding relief request in Section 8.0 or the technical approach and position in Section 2.5. If a Relief Request/TA&P Number is generic to all components, the Number is not listed in these tables.

(7) Notes:

Provides a listing of program notes applicable to the ASME Section XI Item Number, Risk Category Number, or Augmented Number. If a program note number is identified, see the corresponding program note at the end of the Table 7.1-2.

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-A Pressure Retaining Welds in Reactor Vessel	B1.11	Circumferential Shell Welds (Reactor Vessel)	Volumetric	RPV: 3		
	B1.21	Circumferential Head Welds (Reactor Vessel)	Volumetric	RPV: 2		
	B1.30	Shell-to-Flange Weld (Reactor Vessel)	Volumetric	RPV: 1		
	B1.40	Head-to-Flange Weld (Reactor Vessel)	Volumetric & Surface	RPV: 1		
B-B Pressure Retaining Welds in Vessels Other Than Reactor Vessels	B2.11	Circumferential Shell-To-Head Welds (Pressurizer)	Volumetric	PZR: 2		
	B2.12	Longitudinal Shell-To-Head Welds (Pressurizer)	Volumetric	PZR: 2		
	B2.40	Tube Sheet-To-Head Weld (Steam Generator)	Volumetric	SG: 4		
B-D Full Penetration Welds of Nozzles in Vessels	B3.90	Nozzle-to-Vessel Welds (Reactor Vessel)	Volumetric	RPV: 8		
	B3.100	Nozzle Inside Radius Section (Reactor Vessel)	Volumetric	RPV: 8		
	B3.110	Nozzle-to-Vessel Welds (Pressurizer)	Volumetric	PZR: 6	I3R-03,	
	B3.120	Nozzle Inside Radius Section (Pressurizer)	See Note	PZR: 6	I3R-03	14
	B3.140	Nozzle Inside Radius Section (Steam Generator)	See Note	SG: 8		14

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-G-1 Pressure Retaining Bolting, Greater Than 2" In Diameter	B6.10	Closure Head Nuts (Reactor Vessel)	Visual, VT-1	RPV: 3		3
	B6.20	Closure Studs (Reactor Vessel)	Volumetric	RPV: 3		3
	B6.40	Threads in Flange (Reactor Vessel)	Volumetric	RPV: 1		3
	B6.50	Closure Washers, Bushings (Reactor Vessel)	Visual, VT-1	RPV: 3		3
	B6.90	Bolts and Studs (Steam Generator)	Volumetric	SG: 8		3
	B6.100	Flange Surface, When Connection Disassembled (Steam Generator)	Visual, VT-1	SG: 8		3
	B6.110	Nuts, Bushings, and Washers (Steam Generator)	Visual, VT-1	SG: 8		3
	B6.170	Nuts, Bushings, and Washers (Piping)	Visual, VT-1	RPV: 1		3
	B6.180	Bolts & Studs (Pumps)	Volumetric	RC: 4		3
	B6.190	Flange Surface, When Connection Disassembled (Pumps)	Visual, VT-1	RC: 4		3
	B6.200	Nuts, Bushings, and Washers (Pumps)	Visual, VT-1	RC: 4		3
	B6.210	Bolts & Studs (Valves)	Volumetric	RC: 8		3
	B6.220	Flange Surface, When Connection Disassembled (Valves)	Visual, VT-1	RC: 8		3
	B6.230	Nuts, Bushings, and Washers (Valves)	Visual, VT-1	RC: 8		3
B-G-2 Pressure Retaining Bolting, 2" and Less In Diameter	B7.10	Bolts, Studs, & Nuts (Reactor Vessel)	Visual, VT-1	RPV: 2		3
	B7.20	Bolts, Studs, & Nuts (Pressurizer)	Visual, VT-1	PZR: 1		3
	B7.50	Bolts, Studs, & Nuts (Piping)	Visual, VT-1	CV: 4		3
				RC: 4		
				RY: 4		
				SI: 8		
	B7.60	Bolts, Studs, & Nuts (Pumps)	Visual, VT-1	RC: 4		3
	B7.70	Bolts, Studs, & Nuts (Valves)	Visual, VT-1	RC: 4		3
				RH: 4		
				RY: 3		
				SI: 18		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-K Welded Attachments for Vessels, Piping, Pumps, and Valves	B10.10	Welded Attachments (Pressure Vessels)	Surface	PZR: 2		15
	B10.20	Welded Attachments (Piping)	Surface	CV: 1 SI: 6		
B-L-2 Pump Casings	B12.20	Pump Casings (Pumps)	Visual, VT-3	RC: 4		
B-M-2 Valve Bodies	B12.50	Valve Bodies, Exceeding NPS 4 (Valves)	Visual, VT-3	RC: 12 RH: 4 RY: 3 SI: 18		
B-N-1 Interior of Reactor Vessel	B13.10	Vessel Interior (and Head Accessible Surfaces) (Reactor Vessel)	Visual, VT-3	RPV: 2		
B-N-2 Welded Core Support Structures and Interior Attachments to Reactor Vessels	B13.50	Interior Attachments Within Beltline Region (Reactor Vessel)	Visual, VT-1	RPV: 1		
	B13.60	Interior Attachments Beyond Beltline Region (Reactor Vessel)	Visual, VT-3	RPV: 1		
B-N-3 Removable Core Support Structures	B13.70	Core Support Structure (Reactor Vessel)	Visual, VT-3	RPV: 1		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-O Pressure Retaining Welds in Control Rod Housings	B14.10	Welds in CRD Housing (Reactor Vessel) (10% of Peripheral CRD Housing welds to be inspected. 45 of 78 welds are identified as peripheral)	Volumetric or Surface	RPV: 45		
B-P All Pressure Retaining Components	B15.10	System Leakage Test (IWB-5220)	Visual, VT-2	CV RC RH RY SI	I3T-04	
B-Q Steam Generator Tubing	B16.20	Steam Generator Tubing in U-Tube Design	Volumetric Per Tech Specs	SG: 4		

Unit 1 & 0

Inservice Inspection Summary Table 7.1-1

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
C-A Pressure Retaining Welds in Pressure Vessels	C1.10	Shell Circumferential Welds (Pressure Vessels)	Volumetric	RH: 2		
				SG: 4		
	C1.20	Head Circumferential Welds (Pressure Vessels)	Volumetric	RH: 2		
				SG: 4		
	C1.30	Tubesheet-to-Shell-Weld Welds (Pressure Vessels)	Volumetric	SG: 4		
C-B Pressure Retaining Nozzle Welds in Vessels	C2.21	Nozzle-to-Shell (Nozzle to Head or Nozzle to Nozzle) Welds Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric & Surface	RH: 4	I3R-04	4
				SG: 8		
	C2.22	Nozzle Inside Radius Section Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric	RH: 4	I3R-04	4, 6
				SG: 0		
C-C Welded Attachments for Vessels, Piping, Pumps, and Valves	C3.10	Welded Attachments (Pressure Vessels)	Surface	RH: 2		
	C3.20	Welded Attachments (Piping)	Surface	AF: 1		
				CS: 2		
				CV: 2		
				MS: 28		
				RH: 9		
				SI: 10		
				SX: 21		
				VQ: 4		
	C3.30	Welded Attachments (Pumps)	Surface	CS: 12	I3R-05	
				CV: 8		
				RH: 6		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
C-H All Pressure Retaining Components	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	AB AF BR CC CS CV DG FC FP FW IA MS NT OG PC PR PS RC RE RF RH SA SD SI	I3T-03, I3T-04	

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
C-H All Pressure Retaining Components(Continued)	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	SX VQ WE WM WO	I3T-03, I3T-04	

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
D-A Welded Attachments for Vessels, Piping, Pumps, and Valves	D1.10	Welded Attachments (Pressure Vessels)	Visual, VT-1	CC: 2+2		2
				DG: 12		
				FC: 2		
				RH: 2		
				SX: 8		
	D1.20	Welded Attachments (Piping)	Visual, VT-1	AF: 8		2
				CC: 61+4		
				SX: 43+10		
	D1.30	Welded Attachments (Pumps)	Visual, VT-1	AF: 8		2
				SX: 0+4		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
D-B All Pressure Retaining Components	D2.10	System Leakage Test (IWD-5221)	Visual, VT-2	AB AF BR CC CV DG DO FC FP FW PS RE RH RY SA SI SX WE WM WO	I3R-07, I3T-03, I3T-04	

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ/ TA&P NUMBER	NOTES
E-A Containment Surfaces	E1.11	Containment Vessel Pressure Retaining Boundary - Accessible Surface Area	General Visual	318	I3R-01	7
	E1.11	Containment Vessel Pressure Retaining Boundary - Bolted Connections, Surfaces	Visual, VT-3	75	I3R-01	7 11
	E1.30	Containment Vessel Pressure Retaining Boundary - Moisture Barriers	General Visual	1	I3R-01	7
E-C Containment Surfaces Requiring Augmented Examination	E4.11	Containment Surface Areas - Visible Surfaces	Visual, VT-1	0	I3R-01	7 12
	E4.12	Containment Surface Areas - Surface Area Grid, Minimum Wall Thickness Location	Volumetric (Thickness)		I3R-01	7 13

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
F-A Supports	F1.10	Class 1 Piping Supports	Visual, VT-3	CV: 134		1
				RC: 91		
				RH: 20		
				RY: 32		
				SI: 190		
	F1.20	Class 2 Piping Supports	Visual, VT-3	AF: 26		1
				CS: 52		
				CV: 66		
				FW: 39		
				MS: 27		
				RH: 61		
				SI: 157		
				SX: 157		
				VQ: 5		
	F1.30	Class 3 Piping Supports	Visual, VT-3	AF: 563		1, 2
				CC: 326+26		
				SX: 373+248		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ/ TA&P NUMBER	NOTES
F-A Supports (Continued)	F1.40	Supports Other Than Piping Supports (Class 1, 2, and 3)	Visual, VT-3	AF: 2		1
				CC: 3+2		
				CS: 4+2		
				CV: 8		
				DG: 2		
				FC: 1		
				RC: 25		
				RH: 10		
				RY: 5		
				SI: 4		
				SX: 6		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
L-A Concrete	L1.11	Concrete Surfaces - All Accessible Surface Areas	General Visual	42	I3R-01	7
	L1.12	Concrete Surfaces - Suspect Areas (No Suspect Areas Identified)	Detailed Visual	----	I3R-01	7
L-B Unbonded Post-Tensioning System	L2.10	Tendon	IWL-2522	483	I3R-01	7
	L2.20	Tendon - Wire or Strand	IWL-2523.2	483	I3R-01	7
	L2.30	Tendon - Anchorage Hardware and Surrounding Concrete	Detailed Visual	966	I3R-01	7
	L2.40	Tendon - Corrosion Protection Medium	IWL-2525.2(a)	----	I3R-01	7
	L2.50	Tendon - Free Water	IWL-2525.2(b)	----	I3R-01	7

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	RISK CAT NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
R-A Risk-Informed Piping Examinations	1	Risk Category 1 Elements	See notes	FW: 127	I3R-02 I3T-01 I3T-02	8, 9, 10
	2	Risk Category 2 Elements	See notes	AF: 20		
				RC: 176		
				RY: 39		
	4	Risk Category 4 Elements	See notes	AF: 87		
				CS: 172		
				CV: 192		
				MS: 178		
				RC: 408		
				RH: 200		
				RY: 84		
				SD: 4		
				SI: 267		
	5	Risk Category 5 Elements	See notes	CV: 153		
				RC: 3		
				SI: 254		

Unit 1 & 0 **Inservice Inspection Summary Table 7.1-1**

EXAMINATION CATEGORY	AUG NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ/ TA&P NUMBER	NOTES
N/A Augmented Components	3.6.2	Examination of High Energy Circumferential and Longitudinal Piping Welds (MEB 3-1, UFSAR 3.6.1 and 3.6.2).	Volumetric or Surface	N/A		5, 10
	RG1.14	Augmented Examination Of Reactor Coolant Pump Flywheel Per Regulatory Guide 1.14.	Volumetric, Surface & Visual	RC: 4		
	ECCS	Information Notice 79-19, Pipe Cracks in Stagnant Borated Water Systems at PWR Plants.	Volumetric	SI: 94		
	0737	Leak testing and periodic visual examinations of systems outside of primary containment which could contain highly radioactive fluids during a serious transient or accident (NUREG 0737).	Visual, VT-2	CS CV FC GW OG PS RH SI		
	GL8805	Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants.	Visual, VT-2	RC		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-A Pressure Retaining Welds in Reactor Vessel	B1.11	Circumferential Shell Welds (Reactor Vessel)	Volumetric	RPV: 3		
	B1.21	Circumferential Head Welds (Reactor Vessel)	Volumetric	RPV: 2		
	B1.30	Shell-to-Flange Weld (Reactor Vessel)	Volumetric	RPV: 1		
	B1.40	Head-to-Flange Weld (Reactor Vessel)	Volumetric & Surface	RPV: 1		
B-B Pressure Retaining Welds in Vessels Other Than Reactor Vessels	B2.11	Circumferential Shell-To-Head Welds (Pressurizer)	Volumetric	PZR: 2		
	B2.12	Longitudinal Shell-To-Head Welds (Pressurizer)	Volumetric	PZR: 2		
	B2.40	Tube Sheet-To-Head Weld (Steam Generator)	Volumetric	SG: 4		
B-D Full Penetration Welds of Nozzles in Vessels	B3.90	Nozzle-to-Vessel Welds (Reactor Vessel)	Volumetric	RPV: 8		
	B3.100	Nozzle Inside Radius Section (Reactor Vessel)	Volumetric	RPV: 8		
	B3.110	Nozzle-to-Vessel Welds (Pressurizer)	Volumetric	PZR: 6	I3R-03	
	B3.120	Nozzle Inside Radius Section (Pressurizer)	See Note	PZR: 6	I3R-03	14
	B3.140	Nozzle Inside Radius Section (Steam Generator)	See Note	SG: 8		14

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-G-1 Pressure Retaining Bolting, Greater Than 2" In Diameter	B6.10	Closure Head Nuts (Reactor Vessel)	Visual, VT-1	RPV: 3		3
	B6.20	Closure Studs (Reactor Vessel)	Volumetric	RPV: 3		3
	B6.40	Threads in Flange (Reactor Vessel)	Volumetric	RPV: 1		3
	B6.50	Closure Washers, Bushings (Reactor Vessel)	Visual, VT-1	RPV: 3		3
	B6.180	Bolts & Studs (Pumps)	Volumetric	RC: 4		3
	B6.190	Flange Surface, When Connection Disassembled (Pumps)	Visual, VT-1	RC: 4		3
	B6.200	Nuts, Bushings, and Washers (Pumps)	Visual, VT-1	RC: 4		3
	B6.210	Bolts & Studs (Valves)	Volumetric	RC: 8		3
	B6.220	Flange Surface, When Connection Disassembled (Valves)	Visual, VT-1	RC: 8		3
	B6.230	Nuts, Bushings, and Washers (Valves)	Visual, VT-1	RC: 8		3
B-G-2 Pressure Retaining Bolting, 2" and Less In Diameter	B7.10	Bolts, Studs, & Nuts (Reactor Vessel)	Visual, VT-1	RPV: 2		3
	B7.20	Bolts, Studs, & Nuts (Pressurizer)	Visual, VT-1	PZR: 1		3
	B7.30	Bolts, Studs, & Nuts (Steam Generator)	Visual, VT-1	SG: 4		3
	B7.50	Bolts, Studs, & Nuts (Piping)	Visual, VT-1	CV: 4		3
				RC: 4		
				RY: 4		
				SI: 8		
	B7.60	Bolts, Studs, & Nuts (Pumps)	Visual, VT-1	RC: 4		3
	B7.70	Bolts, Studs, & Nuts (Valves)	Visual, VT-1	RC: 4		3
				RH: 4		
				RY: 3		
				SI: 18		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-K Welded Attachments for Vessels, Piping, Pumps, and Valves	B10.10	Welded Attachments (Pressure Vessels)	Surface	PZR: 2		15
	B10.20	Welded Attachments (Piping)	Surface	CV: 1		
				SI: 7		
B-L-2 Pump Casings	B12.20	Pump Casings (Pumps)	Visual, VT-3	RC: 4		
B-M-2 Valve Bodies	B12.50	Valve Bodies, Exceeding NPS 4 (Valves)	Visual, VT-3	RC: 12		
				RH: 4		
				RY: 3		
				SI: 18		
B-N-1 Interior of Reactor Vessel	B13.10	Vessel Interior (and Head Accessible Surfaces) (Reactor Vessel)	Visual, VT-3	RPV: 2		
B-N-2 Welded Core Support Structures and Interior Attachments to Reactor Vessels	B13.50	Interior Attachments Within Beltline Region (Reactor Vessel)	Visual, VT-1	RPV: 1		
	B13.60	Interior Attachments Beyond Beltline Region (Reactor Vessel)	Visual, VT-3	RPV: 1		
B-N-3 Removable Core Support Structures	B13.70	Core Support Structure (Reactor Vessel)	Visual, VT-3	RPV: 1		

Unit 2

Inservice Inspection Summary Table 7.1-2

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
B-O Pressure Retaining Welds in Control Rod Housings	B14.10	Welds in CRD Housing (Reactor Vessel) (10% of Peripheral CRD Housing welds to be inspected. 45 of 78 welds are identified as peripheral)	Volumetric or Surface	RPV: 45		
B-P All Pressure Retaining Components	B15.10	System Leakage Test (IWB-5220)	Visual, VT-2	CV RC RH RY SI	I3T-04	
B-Q Steam Gen. Tubing	B16.20	Steam Generator Tubing in U-Tube Design	Volumetric Per Tech Specs	SG: 4		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
C-A Pressure Retaining Welds in Pressure Vessels	C1.10	Shell Circumferential Welds (Pressure Vessels)	Volumetric	RH: 2 SG: 12		
	C1.20	Head Circumferential Welds (Pressure Vessels)	Volumetric	RH: 2 SG: 4		
	C1.30	Tubesheet-to-Shell-Weld Welds (Pressure Vessels)	Volumetric	SG: 4		
C-B Pressure Retaining Nozzle Welds in Vessels	C2.21	Nozzle-to-Shell (Nozzle to Head or Nozzle to Nozzle) Welds Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric & Surface	RH: 4 SG: 12	I3R-04	4
	C2.22	Nozzle Inside Radius Section Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric	RH: 4 SG: 0	I3R-04	4, 6
C-C Welded Attachments for Vessels, Piping, Pumps, and Valves	C3.10	Welded Attachments (Pressure Vessels)	Surface	RH: 2		
	C3.20	Welded Attachments (Piping)	Surface	CS: 3 CV: 2 FW: 4 MS: 32 RH: 6 SI: 12 SX: 13 VQ: 4		
	C3.30	Welded Attachments (Pumps)	Surface	CS: 12 CV: 8 RH: 6	I3R-05	

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
C-H All Pressure Retaining Components	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	AB AF BR CC CS CV DG FC FP FW IA MS NT OG PC PR PS RC RE RF RH SA SD SI	I3T-03, I3T-04	

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ/ TA&P NUMBER	NOTES
C-H All Pressure Retaining Components) (Continued)	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	SX VQ WE WM WO	I3T-03, I3T-04	

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
D-A Welded Attachments for Vessels, Piping, Pumps, and Valves	D1.10	Welded Attachments (Pressure Vessels)	Visual, VT-1	CC: 2		
				DG: 12		
				FC: 2		
				RH: 2		
				SX: 8		
	D1.20	Welded Attachments (Piping)	Visual, VT-1	AF: 11		
				CC: 4		
				SX: 15		
	D1.30	Welded Attachments (Pumps)	Visual, VT-1	AF: 8		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
D-B All Pressure Retaining Components	D2.10	System Leakage Test (IWD-5221)	Visual, VT-2	AB AF BR CC CV DG DO FC FP FW PS RE RH RY SA SI SX WE WM WO	I3R-07, I3T-03, I3T-04	

Unit 2

Inservice Inspection Summary Table 7.1-2

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
E-A Containment Surfaces	E1.11	Containment Vessel Pressure Retaining Boundary - Accessible Surface Area	General Visual	318	I3R-01	7
	E1.11	Containment Vessel Pressure Retaining Boundary - Bolted Connections, surfaces	Visual, VT-3	120	I3R-01	7 11
	E1.30	Containment Vessel Pressure Retaining Boundary - Moisture Barriers	General Visual	1	I3R-01	7
E-C Containment Surfaces Requiring Augmented Examination	E4.11	Containment Surface Areas - Visible Surfaces	Visual, VT-1	0	I3R-01	7 12
	E4.12	Containment Surface Areas - Surface Area Grid, Minimum Wall Thickness Location	Volumetric (Thickness)		I3R-01	7 13

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
F-A Supports	F1.10	Class 1 Piping Supports	Visual, VT-3	CV: 143		1
				RC: 86		
				RH: 26		
				RY: 37		
				SI: 175		
	F1.20	Class 2 Piping Supports	Visual, VT-3	AF: 30		1
				CS: 55		
				CV: 57		
				FW: 97		
				MS: 32		
				RH: 74		
				SI: 147		
				SX: 155		
				VQ: 5		
	F1.30	Class 3 Piping Supports	Visual, VT-3	AF: 448		1
				CC: 52		
				SX: 277		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
F-A Supports (Continued)	F1.40	Supports Other Than Piping Supports (Class 1, 2, and 3)	Visual, VT-3	AF: 2		1
				CC: 3		
				CS: 6		
				CV: 8		
				DG: 2		
				FC: 1		
				RC: 25		
				RH: 10		
				RY: 5		
				SI: 4		
				SX: 4		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	ITEM NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
L-A Concrete	L1.11	Concrete Surfaces - All Accessible Surface Areas	General Visual	42	I3R-01	7
	L1.12	Concrete Surfaces - Suspect Areas (No Suspect Areas Identified)	Detailed Visual	----	I3R-01	7
L-B Unbonded Post-Tensioning System	L2.10	Tendon	IWL-2522	483	I3R-01	7
	L2.20	Tendon - Wire or Strand	IWL-2523.2	483	I3R-01	7
	L2.30	Tendon - Anchorage Hardware and Surrounding Concrete	Detailed Visual	966	I3R-01	7
	L2.40	Tendon - Corrosion Protection Medium	IWL-2525.2(a)	----	I3R-01	7
	L2.50	Tendon - Free Water	IWL-2525.2(b)	----	I3R-01	7

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	RISK CAT NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
R-A Risk-Informed Piping Examinations	1	Risk Category 1 Elements	See notes	FW: 242	I3R-02 I3T-01 I3T-02	8, 9, 10
	2	Risk Category 2 Elements	See notes	AF: 20		
				RC: 168		
				RY: 34		
	4	Risk Category 4 Elements	See notes	AF: 88		
				CS: 164		
				CV: 200		
				MS: 169		
				RC: 377		
				RH: 215		
				RY: 84		
				SI: 243		
	5	Risk Category 5 Elements	See notes	CV: 150		
				RC: 2		
				SI: 253		

Unit 2 **Inservice Inspection Summary Table 7.1-2**

EXAMINATION CATEGORY	AUG NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTAL NUMBER BY SYSTEM	RELIEF REQ./ TA&P NUMBER	NOTES
N/A Augmented Components	3.6.2	Examination of High Energy Circumferential and Longitudinal Piping Welds (MEB 3-1, UFSAR 3.6.1 and 3.6.2).	Volumetric or Surface	N/A		5, 10
	RG1.14	Augmented Examination Of Reactor Coolant Pump Flywheel Per Regulatory Guide 1.14.	Volumetric, Surface & Visual	RC: 4		
	ECCS	Information Notice 79-19, Pipe Cracks in Stagnant Borated Water Systems at PWR Plants.	Volumetric	SI: 98		
	0737	Leak testing and periodic visual examinations of systems outside of primary containment which could contain highly radioactive fluids during a serious transient or accident (NUREG 0737).	Visual, VT-2	CS CV FC GW OG PS RH SI		
	GL8805	Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants.	Visual, VT-2	RC		

Inservice Inspection Program Notes

Inservice Inspection Summary Table

Note #	Note Summary
1	ISI snubber visual examinations are performed in accordance with the ASME OM Code, Subsection ISTD Program. The number of Byron Station Units 1, 2, and 0 (Common) supports identified includes snubbers for the visual examination of the integral and nonintegral attachments per Paragraphs IWF-5200(c) and IWF-5300(c). The snubbers are scheduled and administratively tracked in the ISI Program; however, the ASME OM Code, Subsection ISTD Program will be the mechanism for actually performing the visual examinations scheduled within the ISI Program. For a detailed discussion of the snubber program, see Section 4.2.
2	The Unit 1 population counts include those components that are common to both units (typically designated as "Common" or Unit 0. These Common components are referenced in Table 7.1-1 following a "+" symbol to designate the Common Unit 0.
3	Valve bolting is characterized by one entry per valve, pump, piping flanges, or vessel manways not by the actual total number of bolts or studs. When the examination is required for a given item's bolting, all bolts shall be inspected. The reactor vessel closure head studs, nuts, and washers (54 total for each item) are examined during more than one Inspection Period. The number of separate examinations for each item identifies the population of these components.
4	The RHR Heat Exchanger nozzles at Byron Station are designed with reinforcing plates internal to the heat exchanger (See Relief Request I3R-07 for a configuration detail). Typically, these reinforcing plates are on the outside of the nozzle making the nozzle-to-shell weld inaccessible for examination. ASME Section XI Item Numbers C2.32 and C2.33 cover examination requirements for these cases; however, they do not address configurations when the reinforcing plate is internal. For this case, Byron Station has classified these welds as Item Number C2.21 since the nozzles do have reinforcing plates, and the nozzle-to-shell weld is accessible for volumetric examination. In addition, Byron Station has submitted Relief Request I3R-07 that addresses the limited volumetric coverage and commits to performing a surface examination on all the nozzles of this type.
5	The population counts reported represents the number of non-exempt circumferential welds. Longitudinal welds are also subject to examination, but actual counts are not reported here. Byron Station examines the portion of the longitudinal weld that falls within the intersecting circumferential weld examination volume.
6	Subsection IWC, Table IWC-2500-1, Examination Category C-B, Item C2.22 requires volumetric examination of the nozzle inner radii of nozzles without reinforcing plates in vessels with nominal thickness > 1/2 in. The main steam nozzle was designed with an internal multiple venturi type flow restrictor with an equivalent throat diameter of 16 inches. This design is used to limit the flow in the event of a postulated steam line break. This design does not utilize a radius nozzle as described in Figures IWC-2500-4(a) and (b,) and therefore is not considered as a Examination Category C-B, Item Number C2.22 component.

Inservice Inspection Program Notes **Inservice Inspection Summary Table**

Note #	Note Summary
7	Examination requirements of Category E-A components Includes all unique identified inspectable surface areas, i.e., Each penetration is one component (total 158). Bolted Connections: Each connection bolt group is counted as 1 item (i.e., 20 bolt flange connection equals 1 item). Examination requirements of Category L-A components Counted three main Areas (Exterior wall, Exterior Dome, and Tendon gallery ceiling) Examination requirements of Category L-B components Equals total number of bearing plates (each bearing plate includes Anchorage hardware and surrounding concrete) Includes (4) Distinct Areas: Horizontal Wall Tendons 402 bearing plates Dome Tendons 240 bearing plates Upper Vertical Tendons 162 bearing plates Lower Vertical Tendons 162 bearing plates (Total) (966 bearing plates)
8	For the Third Inspection Interval, Byron Station's Class 1 and 2 piping inspection program will be governed by risk-informed regulations. The RISI Program methodology is described in the EPRI Topical Reports TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1. The RISI Program scope will be implemented as an alternative to the 2001 Edition through the 2003 Addenda of the ASME Section XI examination program for Class 1 B-F and B-J welds and Class 2 C-F-1 and C-F-2 welds in accordance with 10 CFR 50.55a(a)(3)(i).
9	Examination requirements for Class 1 and 2 piping structural elements within the RISI Program are determined by the various degradation mechanisms present at each individual piping structural element. See EPRI Topical Reports TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1 for specific exam method requirements.
10	For the Third Inspection Interval, the RISI Program scope has been expanded to include welds in the BER piping, also referred to as the HELB region, which includes several non-class welds that fall within the BER augmented inspection program. All BER augmented welds will be evaluated under the RISI methodology and will be integrated into the RISI Program under the 10 CFR 50.59 change process. Additional guidance for adaptation of the RISI evaluation process to BER piping is given in EPRI TR-1006937 Rev. 0-A. Thus, these welds will be categorized and selected for examination in accordance with the EPRI Topical Reports TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1 in lieu of the original commitment to NUREG 0800 in UFSAR Section 3.6.2.

Inservice Inspection Program Notes **Inservice Inspection Summary Table**

Note #	Note Summary
11	Bolted connections examined per Item E1.11 require a VT-3 exam once per interval and each time the connection is disassembled during a scheduled E1.11 exam. Additionally, a VT-1 exam shall be performed if degradation or flaws are identified during the VT-3 exam. These modifications are required by 10 CFR 50.55a(b)(2)(ix)(G) and 10 CFR 50.55a(b)(2)(ix)(H).
12	Item E4.11 requires VT-1 visual examination in lieu of Detailed Visual examination, as modified by 10 CFR 50.55a(b)(2)(ix)(G).
13	The ultrasonic examination acceptance standard specified in IWE-3511.3 for Class MC pressure-retaining components must also be applied to metallic liners of Class CC pressure-retaining components, as modified by 10 CFR 50.55a(b)(2)(ix)(I).
14	Per 10 CFR 50.55a(b)(2)(xxi)(A), *Table IWB-2500-1 examination requirements*, the provisions of Table IWB-2500-1, Examination Category B-D, Items B3.120 and B3.140 in the 1998 Edition must be applied when using the 1999 Addenda through the latest edition and addenda, and requires that a visual examination with enhanced magnification may be performed on the inside radius section in place of an ultrasonic examination.
15	Per 10 CFR 50.55a(b)(2)(xxi)(C), *Table IWB-2500-1 examination requirements*, the provisions of Table IWB-2500-1, Examination Category B-K, Item B10.10, of the 1995 Addenda must be applied when using the 1997 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.

7.2 SNUBBER INSPECTION SUMMARY TABLES

The following Tables 7.2-1 and 7.2-2 provide a summary of the ASME OM Code, Subsection ISTD, Snubber examinations and testing for the Third Inspection Interval at Byron Station Units 1, 2, and 0 (Common).

The format of the Snubber Inspection Summary Tables is as depicted below and provides the following information:

ASME O&M CODE SUBSECTION	O&M ARTICLE NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTALS	FREQUENCY	NOTES
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) ASME O&M Code Subsection:

Provides the applicable Code for Operation and Maintenance of Nuclear Power Plants (O&M) subsection number and a description as obtained from ISTD. Only applicable subsections to Byron Station are identified.

(2) O&M Article Number:

Provides the article number as identified in ISTD. Only those article numbers applicable to Byron Station are identified.

(3) Article Number Description:

Provides the article description as identified in ISTD. Identifies the methods selected to be performed at Byron Station.

(4) Exam Requirements:

Provides the examination and test method(s) required by ISTD.

(5) Totals:

Provides the total number of snubbers that pertain to that article of ISTD. Note that the total number of snubbers are subject to change after completion of plant modifications and design changes.

(6) Frequency:

Provides the frequency for examinations and testing as addressed in ISTD and approved ISTD Code Cases.

(7) Notes:

Provides a listing of program notes applicable to the ISTD article number. If a program note number is identified, see the corresponding program note at the end of the Table 7.2-2.

Unit 1 & 0

Snubber Inspection Summary Table 7.2-1

ASME O&M CODE SUBSECTION	O&M ARTICLE NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTALS	FREQUENCY	NOTES
ISTD Snubber Examinations	ISTD-4200	Accessible and In-Accessible Snubbers (1 population)	Visual, VT-3	228	Once every 10 Years	1
ISTD Snubber Testing	ISTD-5200	10% Functional Test Plan Type 1 Snubbers (PSA-1/4, PSA-1/2)	Functional Testing	68	Every Outage	2
		10% Functional Test Plan Type 2 Snubbers (PSA-1, PSA-3, PSA-10)	Functional Testing	132	Every Outage	2
		10% Functional Test Plan Type 3 Snubbers (PSA-35, PSA-100)	Functional Testing	9	Every Outage	2
		10% Functional Test Plan Type 4 Snubbers (Paul Munroe Steam Generator Snubbers)	Functional Testing	8	Every Outage	2
		10% Functional Test Plan Type 5 Snubbers (LISEGA 30 Series)	Functional Testing	11	Every Outage	2

Unit 2

Snubber Inspection Summary Table 7.2-2

ASME O&M CODE SUBSECTION	O&M ARTICLE NUMBER	DESCRIPTION	EXAM REQUIREMENTS	TOTALS	FREQUENCY	NOTES
ISTD Snubber Examinations	ISTD-4200	Accessible and In-Accessible Snubbers (1 population)	Visual, VT-3	317**	Once every 10 Years	1
ISTD Snubber Testing	ISTD-5200	10% Functional Test Plan Type 1 Snubbers (PSA-1/4, PSA-1/2)	Functional Testing	61	Every Outage	2
		10% Functional Test Plan Type 2 Snubbers (PSA-1, PSA-3, PSA-10)	Functional Testing	226	Every Outage	2
		10% Functional Test Plan Type 3 Snubbers (PSA-35, PSA-100)	Functional Testing	14	Every Outage	2
		10% Functional Test Plan Type 4 Snubbers (Boeing Steam Generator Snubbers)	Functional Testing	8	Every Outage	2
		10% Functional Test Plan Type 5 Snubbers (LISEGA 30 Series)	Functional Testing	8	Every Outage	2

Snubber Program Notes

Snubber Inspection Summary Table 7.2-2

Note #	Note Summary
1	Examinations performed per Code Case OMN-13, "Requirements for Extending Snubber Inservice Visual Examination Interval at LWR Power Plants".
2	Per ISTD 2001 Edition through the 2003 Addenda, Article ISTD-5240 "Test Frequency".

8.0 RELIEF REQUESTS FROM ASME SECTION XI

This section contains relief requests written per 10 CFR 50.55a(a)(3)(i) for situations where alternatives to ASME Section XI requirements provide an acceptable level of quality and safety; per 10 CFR 50.55a(a)(3)(ii) for situations where compliance with ASME Section XI requirements results in a hardship or an unusual difficulty without a compensating increase in the level of quality and safety; and per 10 CFR 50.55a(g)(5)(iii) for situations where ASME Section XI requirements are considered impractical.

The following NRC guidance was utilized to determine the correct 10 CFR 50.55a Paragraph citing for Byron Station relief requests. 10 CFR 50.55a(a)(3)(i) and 10 CFR 50.55a(a)(3)(ii) provide alternatives to the requirements of ASME Section XI, while 10 CFR 50.55a(g)(5)(iii) recognizes situational impracticalities.

10 CFR 50.55a(a)(3)(i): Cited in relief requests when alternatives to the ASME Section XI requirements which provide an acceptable level of quality and safety are proposed. Examples are relief requests which propose alternative NDE methods and/or examination frequency.

10 CFR 50.55a(a)(3)(ii): Cited in relief requests when compliance with the ASME Section XI requirements is deemed to be a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Examples of hardship and/or unusual difficulty include, but are not limited to, excessive radiation exposure, disassembly of components solely to provide access for examinations, and development of sophisticated tooling that would result in only minimal increases in examination coverage.

10 CFR 50.55a(g)(5)(iii): Cited in relief requests when conformance with ASME Section XI requirements is deemed impractical. Examples of impractical requirements are situations where the component would have to be redesigned, or replaced to enable the required inspection to be performed.

An index for Byron Station relief requests is included in Table 8.0-1. The "I3R-XX" relief requests are applicable to ISI, SPT, and CISI.

The following relief requests are subject to change throughout the inspection interval.

TABLE 8.0-1
RELIEF REQUEST INDEX
Sheet 1 of 2

RELIEF REQUEST	REVISION DATE[3]	STATUS[2]	DESCRIPTION OF RELIEF REQUEST/ NRC APPROVAL SUMMARY[1]
I3R-01	1 9/12/05	Submitted	**(ISI & CISI)** Synchronization of Ten-Year ISI Intervals between Unit 1 and Unit 2 for Class 1, 2, and 3. In addition, alignment of Containment Inservice Inspection (CISI) Ten-Year Intervals for Class MC and CC with the synchronized Unit 1 and 2 Ten-Year ISI Interval. **Submitted separately on 11/08/05.**
I3R-02	0 9/12/05	Submitted	**(ISI)** Alternate Risk-Informed Selection and Examination Criteria for Category B-F, B-J, C-F-1, and C-F-2 Pressure Retaining Piping Welds.
I3R-03	0 9/12/05	Submitted	**(ISI)** Limited Volumetric Examination of the Pressurizer Surge Nozzle-to-Vessel Head Weld and Surge Nozzle Inside Radius Section.
I3R-04	0 9/12/05	Submitted	**(ISI)** Limited Volumetric Examination of Residual Heat Removal Heat Exchanger Nozzle-to-Vessel Welds and Nozzle Inside Radius Section.
I3R-05	0 9/12/05	Submitted	**(ISI)** Limited Surface Examination of Centrifugal Charging (CV) Pumps, Containment Spray Pumps, and Residual Heat Removal Pumps Attachment Welds.
I3R-06	0 9/12/05	Submitted	**(ISI)** Repair of Control Rod Drive Mechanism (CRDM) Canopy Seal Welds in Accordance with IWA-4000.
I3R-07	0 9/12/05	Drafted	**(SPT)** Alternative Examination Requirements of ASME Section XI, IWA-5244, "Buried Piping".
I3R-XX	0 9/12/05	Drafted	**(ISI)** Alternate Rules for the Inservice Inspection of the Pressurizer Seismic Lug Welds.
I3R-XX	0 9/12/05	Drafted	**(ISI)** Limited Examinations on Pressurizer Spray, Safety, and Relief Nozzle-to-Vessel Welds.
I3R-XX	0 9/12/05	Drafted	**(ISI)** Limited Volumetric Examination of Reactor Pressure Vessel Head-to-Flange Weld.
I3R-XX	0 9/12/05	Drafted	**(ISI)** Limited Volumetric Examination of Reactor Vessel Circumferential Shell Welds.
I3R-XX	0 9/12/05	Drafted	**(ISI)** Limited Volumetric Examination of the Reactor Vessel Outlet Nozzle-to-Vessel Welds.
I3R-XX	0 9/12/05	Drafted	**(PDI & ISI)** Alternative Requirements Dissimilar Metal Piping Welds Subject to Examination Using Procedures, Personnel, and Equipment Qualified to ASME Section XI, Appendix VIII, Supplement 10 Criteria.
I3R-XX	0 9/12/05	Drafted	**(PDI & ISI)** Alternative Requirements for Implementation of Appendix VIII, Supplements 2 and 10 as Coordinated by Supplement 14.
I3R-XX	0 9/12/05	Drafted	**(PDI & ISI)** Alternative Requirements to Appendix VII of ASME Section XI, VII-4240, "Annual Training".
I3R-XX	0 9/12/05	Drafted	**(PDI & ISI)** Alternative requirements to Appendix VIII, Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Vessel.

Note 1: The NRC grants relief requests pursuant to 10 CFR 50.55a(g)(6)(i) when Code requirements cannot be met and proposed alternatives do not meet the criteria of 10 CFR 50.55(a)(3). The NRC authorizes relief requests pursuant to 10 CFR 50.55a(a)(3)(i) if the proposed alternatives would provide an acceptable level of quality and safety or under (3)(ii) if compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of safety.

Note 2: This column represents the status of the latest revision. Relief Request Status Options: Authorized - Approved for use in an NRC SER (See Note 1); Granted - Approved for use in an NRC SER (See Note 1); Authorized Conditionally - Approved for use in a NRC SER that imposes certain conditions; Granted Conditionally - Approved for use in a NRC SER that imposes certain conditions; Denied - Use denied in a NRC SER; Expired - Approval for relief has expired; Withdrawn - Relief has been withdrawn by the station; Not Required - The NRC has deemed the relief unnecessary in an SER or RAI; Cancelled - Relief has been cancelled by the station prior to issue; Drafted - Drafted relief awaiting submittal and/or pending approval; and Submitted - Relief has been submitted to the NRC by the station and is awaiting approval

Note 3: The revision listed is the latest revision of the subject relief request. The date this revision became effective is the date of the approving SER that is listed in the fourth column of the table. The date noted in the second column is the date of the ISI Program Plan revision when the relief request was incorporated into the document.

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Request for Relief for Alternate Risk-Informed Selection and Examination Criteria for Category B-F, B-J, C-F-1, and C-F-2 Pressure Retaining Piping Welds In Accordance with 10 CFR 50.55a(a)(3)(i)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	1 and 2
Examination Category:	B-F, B-J, C-F-1, and C-F-2
Item Number:	B5.10, B5.40, B5.70, B9.11, B9.21, B9.22, B9.31, B9.32, B9.40, C5.11, C5.21, C5.30, C5.41, C5.51, C5.61, C5.70, and C5.81
Description:	Alternate Risk-Informed Selection and Examination Criteria for Category B-F, B-J, C-F-1, and C-F-2 Pressure Retaining Piping Welds
Component Number:	Pressure Retaining Piping

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

Table IWB-2500-1, Examination Category B-F, requires volumetric and surface examinations on all welds for Items B5.10, B5.40, and B5.70.

Table IWB-2500-1, Examination Category B-J, requires volumetric and/or surface examinations on a sample of welds for Items B9.11, B9.21, B9.22, B9.31, B9.32, and B9.40. The weld population selected for inspection includes the following:

1. All terminal ends in each pipe or branch run connected to vessels.
2. All terminal ends and joints in each pipe or branch run connected to other components where the stress levels exceed either of the following limits under loads associated with specific seismic events and operational conditions:
   a. primary plus secondary stress intensity range of $2.4S_m$ for ferritic steel and austenitic steel.
   b. cumulative usage factor U of 0.4.
3. All dissimilar metal welds not covered under Category B-F.

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4. Additional piping welds so that the total number of circumferential butt welds, branch connections, or socket welds selected for examination equals 25% of the circumferential butt welds, branch connection, or socket welds in the reactor coolant piping system. This total does not include welds exempted by IWB-1220 or welds in Item No. B9.22.

5. A 10% sample of PWR high pressure safety injection system circumferential welds in piping ≥ NPS 1½ and < NPS 4 shall be selected for examination. This sample shall be selected from locations determined by the Owner as most likely to be subject to thermal fatigue.

Table IWC-2500-1, Examination Categories C-F-1 and C-F-2 require volumetric and/or surface examinations on a sample of welds for Items C5.11, C5.21, C5.30, C5.41, C5.51, C5.61, C5.70, and C5.81. The weld population selected for inspection includes the following:

1. Welds selected for examination shall include 7.5%, but not less than 28 welds, of all dissimilar metal, austenitic stainless steel and high alloy welds (Category C-F-1) or of all carbon and low alloy steel welds (Category C-F-2) not exempted by IWC-1220. (Some welds not exempted by IWC-1220 are not required to be nondestructively examined per Examination Categories C-F-1 and C-F-2. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

   a. the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt dissimilar metal, austenitic stainless steel and high alloy welds (Category C-F-1) or carbon and low alloy welds (Category C-F-2) in each system;

   b. within a system, the examinations shall be distributed among terminal ends, dissimilar metal welds, and structural discontinuities prorated, to the degree practicable, on the number of nonexempt terminal ends, dissimilar metal welds, and structural discontinuities in the system; and

   c. within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative utilizing Reference 1 along with two enhancements from Reference 4 will provide an acceptable level of quality and safety.

As stated in "Safety Evaluation Report Related to EPRI Risk-Informed Inservice Inspection Evaluation Procedure (EPRI TR-112657, Revision B, July 1999)" (Reference 2):

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> "The staff concludes that the proposed RISI program as described in EPRI TR-112657, Revision B, is a sound technical approach and will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a for the proposed alternative to the piping ISI requirements with regard to the number of locations, locations of inspections, and methods of inspection."

The initial Byron Station RISI Program was submitted during the Second Period of the Second Interval for Unit 1 and during the First Period of the Second Interval for Unit 2. This initial RISI program was developed in accordance with EPRI TR-112657, Revision B-A, as supplemented by Code Case N-578-1. The program was approved for use by the NRC via a Safety Evaluation as transmitted to Exelon on February 5, 2002 (Reference 5).

The transition from the 1989 Edition to the 2001 Edition through the 2003 Addenda of ASME Section XI for Byron Station's Third Interval does not impact the currently approved Risk-Informed ISI evaluation process used in the Second Interval, and the requirements of the new Code edition/addenda will be implemented as detailed in the Byron Station ISI Program Plan.

The Risk Impact Assessment completed as part of the original baseline RISI Program was an implementation/transition check on the initial impact of converting from a traditional ASME Section XI program to the new RISI methodology. For the Third Interval ISI update, there is no transition occurring between two different methodologies, but rather, the currently approved RISI methodology and evaluation will be maintained for the new interval. As such, the original risk impact assessment is not a necessary element of the implementing process and is not required to be continually updated.

As an added measure of assurance, any new systems, portions of systems, or components being included in the RISI Program for the Third Interval will be added to the Risk Impact Assessment performed during the previous interval. These components will be addressed within the evaluation at the start of the new interval to assure that the new Third Interval RISI element selection provides an acceptable overall change-in-risk when compared to the old ASME Section XI population of exams which existed prior to the implementation of the first RISI Program.

The actual evaluation and ranking procedure including the Consequence Evaluation and Degradation Mechanism Assessment processes of the currently approved (Reference 5) RISI Program remain unchanged and are continually applied to maintain the Risk Categorization and Element Selection methods of EPRI TR-112657, Revision B-A. These portions of the RISI Program are reevaluated as major revisions of the site PRA occur and modifications to plant configuration are made. The Consequence Evaluation, Degradation Mechanism Assessment, Risk Ranking, and Element Selection steps encompass the complete *living program* process applied under the Byron RISI Program.

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5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

The proposed alternative originally implemented in the "Risk Informed Inservice Inspection Plan, Byron Station Units 1 and 2 (Reference 3), along with the two enhancements noted below, provide an acceptable level of quality and safety as required by 10 CFR 50.55a(a)(3)(i). This original program along with these same two enhancements is currently approved for Byron Station's Second Inspection Interval as documented in Reference 5.

The Third Interval RISI Program will be a continuation of the current application and will continue to be a living program as described in the Reason For Request section of this relief request. No changes to the evaluation methodology as currently implemented under EPRI TR-112657, Revision B-A, are required as part of this interval update. The following two enhancements will continue to be implemented.

In lieu of the evaluation and sample expansion requirements in Section 3.6.6.2, "RISI Selected Examinations" of EPRI TR-112657, Byron Station will utilize the requirements of Subarticle -2430, "Additional Examinations" contained in Code Case N-578-1 (Reference 4). The alternative criteria for additional examinations contained in Code Case N-578-1 provides a more refined methodology for implementing necessary additional examinations.

To supplement the requirements listed in Table 4-1, "Summary of Degradation-Specific Inspection Requirements and Examination Methods" of EPRI TR-112657, Byron Station will utilize the provisions listed in Table 1, Examination Category R-A, "Risk-Informed Piping Examinations" contained in Code Case N-578-1 (Reference 4). To implement Note 10 of this table, paragraphs and figures from the 2001 Edition through the 2003 Addenda of ASME Section XI (Byron Station's code of record for the Third Interval) will be utilized which parallel those referenced in the Code Case for the 1989 Edition. Table 1 of Code Case N-578-1 will be used as it provides a detailed breakdown for examination method and categorization of parts to be examined.

The Byron Station RISI Program, as developed in accordance with EPRI TR-112657, Rev. B-A (Reference 1), requires that 25% of the elements that are categorized as "High" risk (i.e., Risk Category 1, 2, and 3) and 10% of the elements that are categorized as "Medium" risk (i.e., Risk Categories 4 and 5) be selected for inspection. For this application, the guidance for the examination volume for a given degradation mechanism is provided by the EPRI TR-112657 while the guidance for the examination method and categorization of parts to be examined are provided by the EPRI TR-112657 as supplemented by Code Case N-578-1.

In addition to this risk-informed evaluation, selection, and examination procedure, all ASME Section XI piping components, regardless of risk classification, will continue to receive Code required pressure testing as part of the current ASME Section XI program. VT-2 visual examinations are scheduled in accordance with the Byron Station pressure testing program, which remains unaffected by the RISI program.

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6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

Similar relief requests have been approved for:

Byron Station Second Inspection Interval Relief Request I2R-40 was authorized per SER dated 2/5/02. The Third Inspection Interval Relief Request will utilize the identical RISI methodology that was previously approved in the Second Inspection Interval.

Dresden Station Fourth Inspection Interval Relief Request I4R-02 was authorized per SER dated 9/4/03.

Quad Cities Station Fourth Inspection Interval Relief Request I4R-02 was authorized per SER dated 1/28/04.

8.0 REFERENCES:

1) Electric Power Research Institute (EPRI) Topical Report (TR) 112657 Rev. B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure", December 1999
2) W. H. Bateman (NRC) to G. L. Vine (EPRI) letter dated October 28, 1999 transmitting "Safety Evaluation Report Related to EPRI Risk-Informed Inservice Inspection Evaluation Procedure (EPRI TR-112657, Revision B, July 1999)"
3) Initial Risk-Informed Inservice Inspection Evaluation – Byron Nuclear Power Station Units 1 and 2 (Dated August 2000)
4) American Society of Mechanical Engineers (ASME) Code Case N-578-1, "Risk-Informed Requirements for Class 1, 2, or 3 Piping, Method B"
5) A. J. Mendiola (NRC) to O. D. Kingsley (Exelon) letter dated February 5, 2002 transmitting "Safety Evaluation of Second Interval Risk-Informed Inservice Inspection Program Relief Request"

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Request for Relief for Hardship Or Unusual Difficulty Without Compensating Increase In Level Of Quality Or Safety Limited Volumetric Examination of the Pressurizer Surge Nozzle-to-Vessel Head Weld and Surge Nozzle Inside Radius Section In Accordance with 10 CFR 50.55a(a)(3)(ii)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	1
Reference:	IWB-2500, Table IWB-2500-1
Examination Category:	B-D
Item Number:	B3.110 (2001 Edition through the 2003 Addenda) and B3.120 (1998 Edition with No Addenda per 10 CFR 50.55a(b)(2)(xxi)(A))
Description:	Limited Volumetric Examination of the Pressurizer Surge Nozzle-to-Vessel Head Weld and Surge Nozzle Inside Radius Section
Component Number:	1RY-01-S, PN-01 and 1RY-01-S, PN-01-NIR (Unit 1) 2RY-01-S/PN-01 and 2RY-01-S, PN-01-NIR (Unit 2)
Drawing Number:	1PZR-1-ISI (Unit 1) and 2PZR-1-ISI (Unit 2)

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

Per 10 CFR 50.55a(b)(2)(xxi)(A), the provisions of Table IWB-2500-1, Examination Category B-D, Full Penetration Welded Nozzles in Vessels, Item B3.120 (Inspection Program B) in the 1998 Edition must be applied when using the 1999 Addenda through the latest edition and addenda incorporated by reference in Paragraph (b)(2) of this section.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

Table IWB-2500-1, Examination Category B-D, Item Numbers B3.110 and B3.120 require a 100% volumetric examination of Pressurizer Nozzle-to-Vessel Welds and Pressurizer Nozzle Inside Radius Section as detailed in Figure IWB-2500-7(b).

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4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The Byron Station Unit 1 and 2 Pressurizers include a single surge nozzle, which is welded to the lower head as shown in Figure 1. In order to perform the code required volumetric examinations on the nozzle-to-vessel weld and the nozzle inside radius section, the outer surface of the lower vessel head must be accessible for proper surface preparation and ultrasonic scanning.

The lower head is normally covered by a 4 inch thick, multi-layered stainless steel insulation which was not designed for removal. In order to remove the insulation, the 78 heater penetration cables shown in Figure 2 would have to be disconnected. In addition, each of the 78 convection stops, which are riveted to the insulation, would have to be cut to facilitate the insulation removal per Figure 3.

The radiation exposure to plant personnel for the insulation removal, surface preparation, and examination is estimated to be 30 person-rem, based on an area dose rate of 100mR/hour.

Even with the insulation removed, full volumetric examination coverage of the nozzle-to-vessel weld cannot be achieved. The surge nozzle geometry limits ultrasonic transducer contact, and thus scanning on the nozzle side of the weld is impractical. On the vessel side of the weld, the heater penetrations obstruct scanning such that only a small percentage of the weld volume could be captured.

Very limited volumetric examination of the nozzle inside radius section is achievable from the outside surface of the pressurizer with the insulation removed. The blend region would not be accessible to allow for an adequate surface preparation and examination. A limited exam would be possible if scanning was performed from the nozzle side; however, due to the complex geometry of the nozzle, the resulting coverage would provide very limited data from which to assess the condition of the inside radius.

Volumetric examination of the nozzle-to-head weld and nozzle inside radius section is also not practical from the vessel inside surface. The inside surface is accessible only by removing the manway. The radiation exposure for the removal and reinstallation of the manway is estimated to be approximately 2 person-rem. In addition, the internal baffle plates would obstruct access to the debris screen and surrounding inside surfaces of the nozzle, thus prohibiting a volumetric examination and the alternative enhanced visual examination allowed by 10 CFR 50.55a(b)(2)(xxi)(A).

Based on the above information, the code required volumetric examination of the pressurizer nozzle-to-vessel lower head weld and associated nozzle inside radius section is deemed impractical. Even partial compliance with the specified requirements would result in hardship or unusual difficulty without a compensating

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increase in the level of quality and safety. The personnel radiation hazards associated with limited data obtained by partial volumetric examination is not justified.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

The pressurizer surge nozzle-to-vessel weld will be volumetrically examined if the lower head insulation is removed for any reason.

In addition, a VT-2 examination during system pressure testing per Examination Category B-P will be performed on the Pressurizer each refueling outage to verify leaktight integrity of these areas.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

Similar relief requests have been approved for:

Byron Station Second Inspection Interval Relief Request I2R-03 was authorized per SER dated 12/30/98.

Braidwood Station Second Inspection Interval Relief Request I2R-08 was granted per SER dated 1/6/00.

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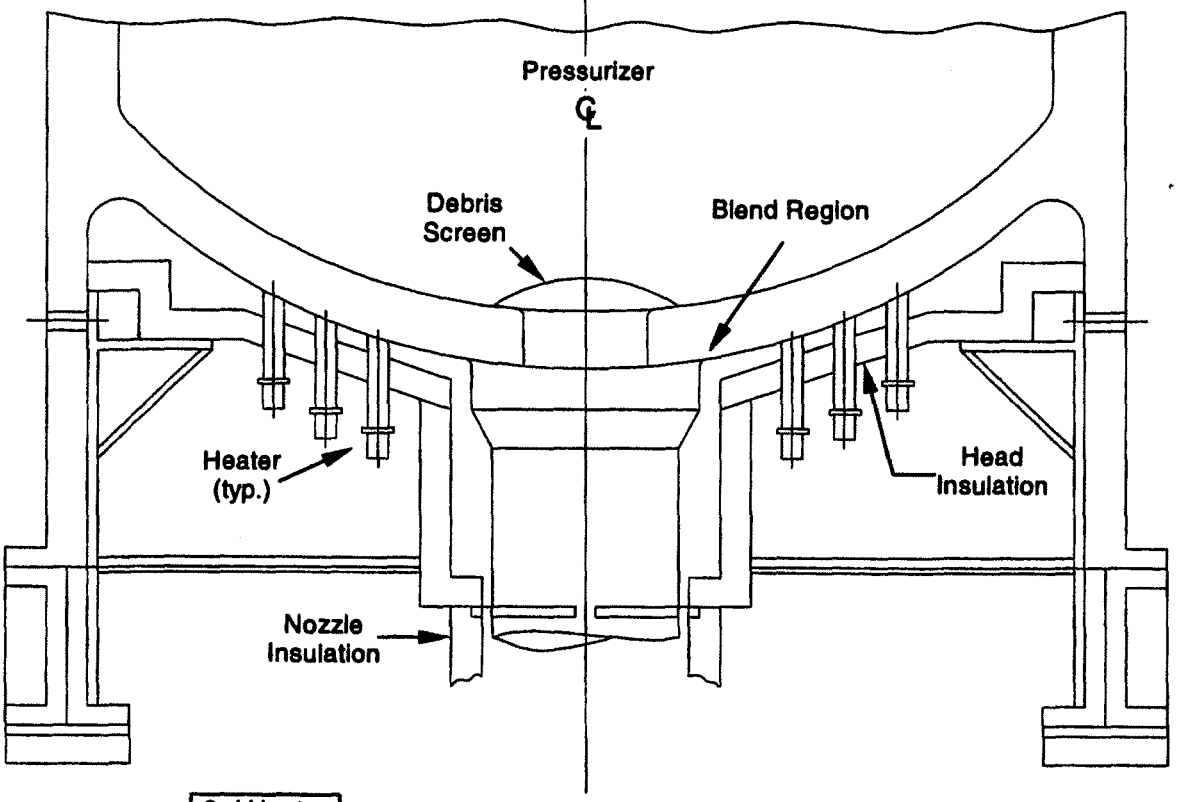
FIGURE 1:
Pressurizer Lower Head Assembly



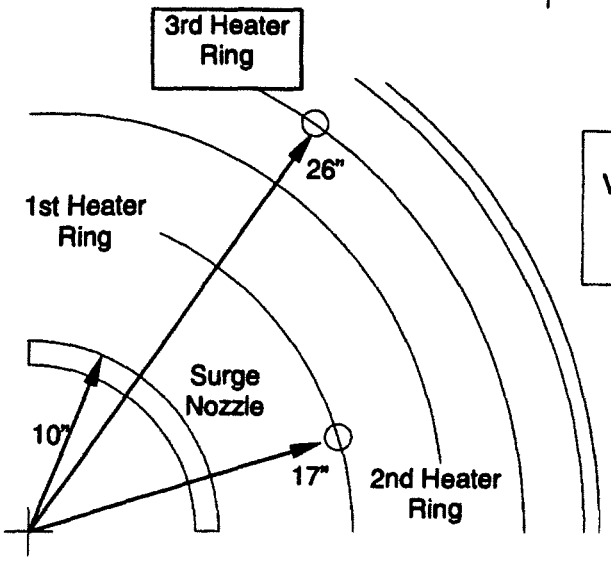


FIGURE 2:
Vessel Centerline Distance to Surge Nozzle and Heater Elements

1st Ring: 20 Heater Elements
2nd Ring: 26 Heater Elements
3rd Ring: 32 Heater Elements

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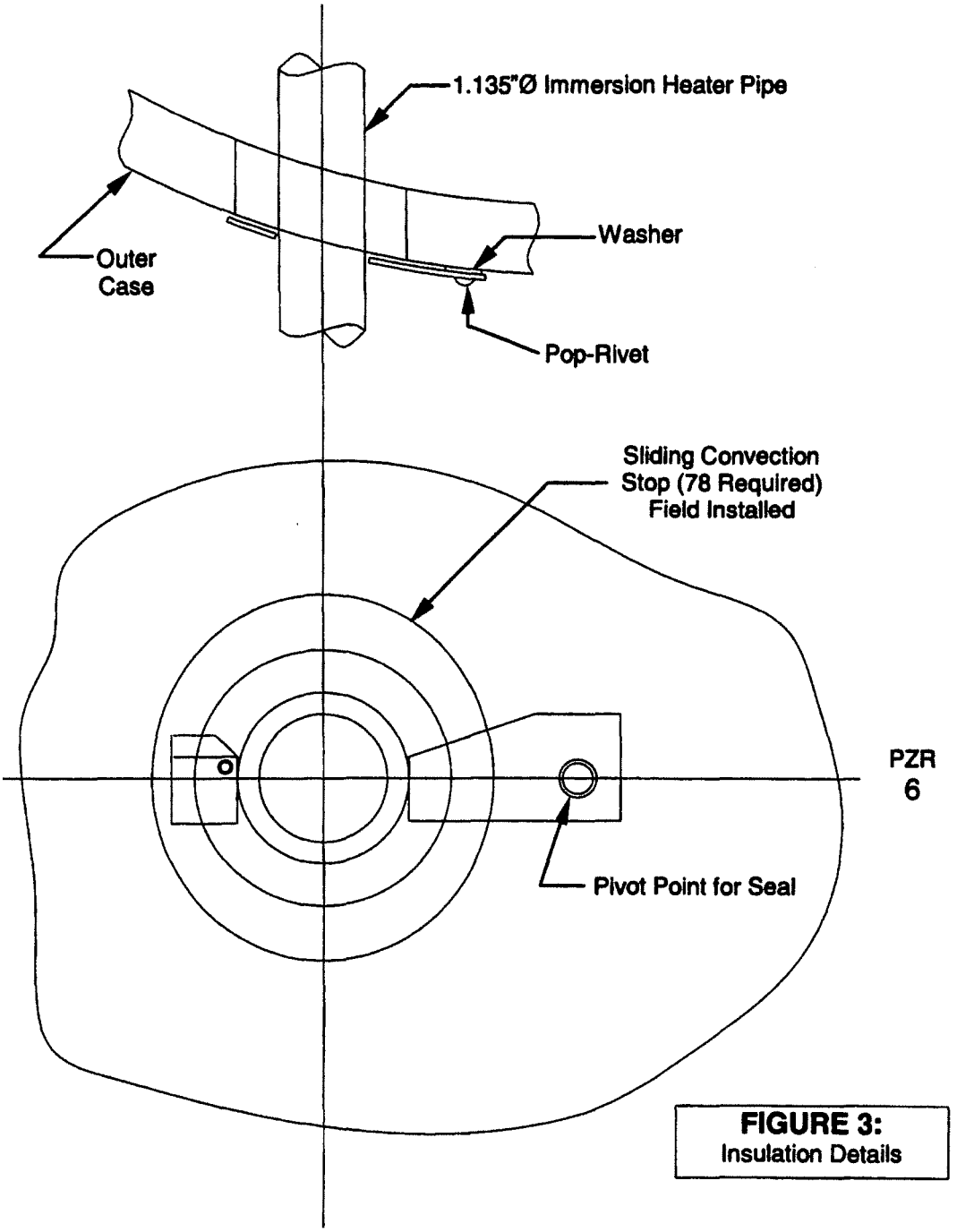

FIGURE 3:
Insulation Details

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Request for Relief for Alternate Risk-Informed Examination Criteria Limited Volumetric Examination Of Residual Heat Removal Heat Exchanger Nozzle-to-Shell Welds In Accordance with 10 CFR 50.55a(a)(3)(i)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	2
Reference:	Table IWC-2500-1
Examination Category:	C-B
Item Number:	C2.21 and C2.22
Description:	Limited Volumetric Examination Of Residual Heat Removal Heat Exchanger Nozzle-to-Shell Welds and Nozzle Inside Radius Section
Component Number:	1RH-02-AA/RHXN-01, 1RH-02-AA/RHXN-02, 1RH-02-AB/RHXN-01, 1RH-02-AB/RHXN-02 (Unit 1) 2RH-02-AA/RHXN-01, 2RH-02-AA/RHXN-02, 2RH-02-AB/RHXN-01, 2RH-02-AB/RHXN-02 (Unit 2)
Drawing Number:	1RHX-1-ISI, Sheet 1 of 1 (Unit 1) 2RHX-1-ISI, Sheet 1 of 1 (Unit 2)

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

Table IWC-2500-1, Examination Category C-B, Item Number C2.21 requires a surface and volumetric examination of Nozzle-to-Shell Welds for Nozzles without Reinforcing Plate in Vessels > 1/2 inch Nominal Thickness per Figures IWC-2500-4(a), (b), and (d).

Table IWC-2500-1, Examination Category C-B, Item Number C2.22 requires a volumetric examination of the Nozzle Inside Radius Section for Nozzles without Reinforcing Plate in Vessels > 1/2 inch Nominal Thickness per Figures IWC-2500-4(a), (b), and (d).

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4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

Component Configuration Considerations

The Residual Heat Removal Heat Exchangers were fabricated with a nominal wall thickness of 0.875 inch and 14 inch diameter inlet and outlet nozzles that are 0.375" nominal wall thickness. As shown in Figure 1, the subject configuration is best characterized as a fillet welded nozzle with an internal reinforcement pad. This configuration is not represented in the examination figures in IWC-2500-1 for Category C-B nozzles. The configuration is similar to that shown in Figure IWC-2500-4(c), except for the *internal* location of the reinforcing pad. Conservatively, the examination requirements for the RHR Heat exchanger (RHRHX) nozzles have been specified using Examination Figure IWC-2500-4(d).

Due to the geometrical constraints of this nozzle design, the ultrasonic examination of nozzle-to-vessel welds (Item C2.21) will not achieve 90% coverage. The ultrasonic examination performed from the nozzle outside surface would be obstructed by the reinforcement fillet weld located directly above the nozzle-to-vessel weld and the adjacent features on the shell-side of the nozzles (shell-to-flange and the shell-to-lower head welds). This fillet weld restricts inspection transducer movement and limits available examination angles. Based on previous data and coverage plots, it is estimated that 98.26% of the examination volume could be reached in the axial direction and 0% with the limited circumferential scans. The total scanning percentage achievable would be less than 50%. (See Figure 2 of this report for scan coverage plots.)

Design and Operational Considerations

A finite element analysis was also performed and submitted to the USNRC Staff for review (See Section 8.0 References) in support of earlier relief requests at both Byron and Braidwood Stations. The results of this analysis showed that the inside diameter (I.D.) of the nozzle is in compression and the outside diameter (O.D.) is in tension. Consequently, any service-induced flaw would be expected to initiate at the O.D. of the nozzle where the weld membrane stresses are in tension. Performance of surface examinations each inspection period will provide the best means for detection of expected service induced flaws and provide assurance that a service induced defect will be identified prior to component failure. Ultrasonic examinations of the RHRHX nozzle-to-vessel weld will not provide detection capabilities of expected service-induced flaws beyond that provided by surface examination. Additionally, continued performance of ultrasonic examinations would require extensive resources, unnecessary radiation exposure to the examiners, and significant cost without a commensurate increase in quality or public safety.

Furthermore, Technical Basis LTR-PAFM-03-24, prepared by Westinghouse in August 2003 in support of an ASME Section XI Code action, concludes, "the regenerative and

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residual heat exchangers are carefully designed and constructed to ASME Code rules. The weld regions of these components have not been designed for volumetric inspection, and such inspections are time consuming and can be extremely dose intensive.

These heat exchangers do not have a severe duty cycle, and service experience has been good. The design transients for the vessels are very minimal because the component only operates during the shutdown phase of a fuel cycle. Considering the low safety significance of these heat exchangers and the large flaw tolerance, continuation of the volumetric and surface examinations results in a hardship without a commensurate increase in the level of quality and safety".

Unobstructed Available Examination Techniques

The outside surfaces of all of these nozzle-to-vessel welds are accessible for surface technique examinations due to the internal location of the reinforcing pads. In lieu of the ASME Section XI volumetric examinations required on the RHR HX C2.21 nozzle welds of only one of the like heat exchangers, the station will take advantage of the accessibility of these welds for surface examination and the entire weld population of RHR HX C2.21 nozzle welds will each be examined once over the interval.

Also, due to the unique configuration of the nozzle reinforcing pads being on the internal surface, the nozzle inner radius (Item C2.22) is inaccessible for examination. The inside corner of the reinforcing pads themselves could become accessible if the heat exchanges were ever disassembled and would be treated as the exam area should this access from the inside become available for other maintenance or repair reasons.

Finally, a visual (VT-2) examination of each heat exchanger, nozzle, and associated piping is performed three times per interval (each inspection Period per Examination Category C-H).

Based on this information, reasonable assurance of the continued inservice structural integrity of the subject welds will be achieved through the proposed alternative examinations.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

An ASME Section XI surface examination will be performed once per interval on each nozzle-to-vessel weld of the Byron Station RHR Heat Exchangers.

In addition, when disassembly of a heat exchanger is conducted for maintenance or repair purposes, a visual (VT-1) examination will be performed. The exam will be on one inlet and one outlet nozzle inner radii in one heat exchanger per unit and will be performed either directly or remotely, to the extent practical, once in the interval.

All other ASME Section XI requirements pertaining to the RHR Heat Exchangers will continue to receive the Code required examinations. Vessel shell weld volumetric examinations, vessel support examinations, and pressure testing (VT-2 once during

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each period) are performed and scheduled in accordance with the Byron Station Inservice Inspection Program.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

Similar relief requests have been approved for:

Byron Station Second Inspection Interval Relief Request I2R-05 was authorized per SER dated 1/13/98.

Braidwood Station Second Inspection Interval Relief Request I2R-07 was authorized per SER dated 9/10/99.

8.0 REFERENCES:

Harold D. Pontious, Jr. (ComEd) letter to USNRC Document Control Desk, "Supplemental Information Regarding the Fracture Mechanics Evaluation of Residual Heat Removal System Heat Exchanger Inlet and Outlet Nozzle to Shell Welds," dated November 9, 1994.

Denise M. Saccomando (ComEd) letter to USNRC Document Control Desk "Supplement to Fracture Mechanics Evaluation of Residual Heat Removal System Heat Exchanger Inlet and Outlet Nozzle to Shell Welds," dated December 20 1994.

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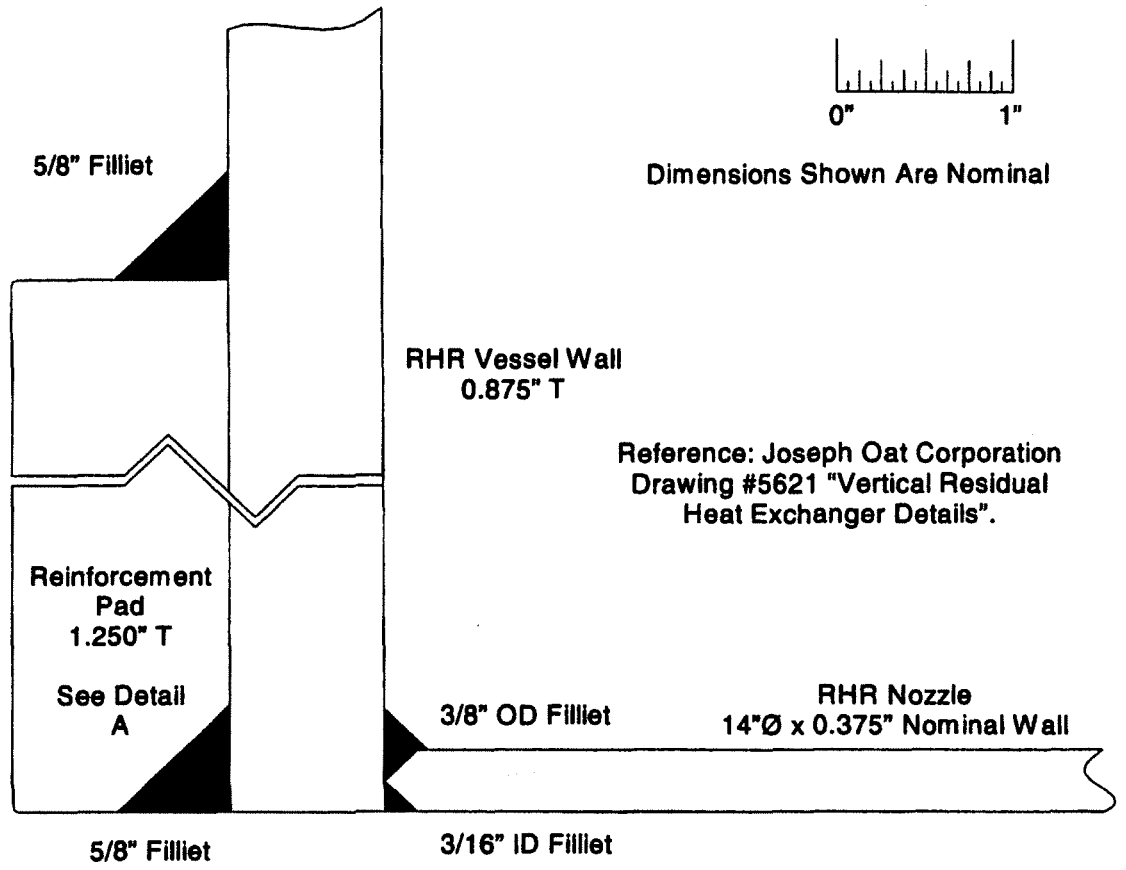

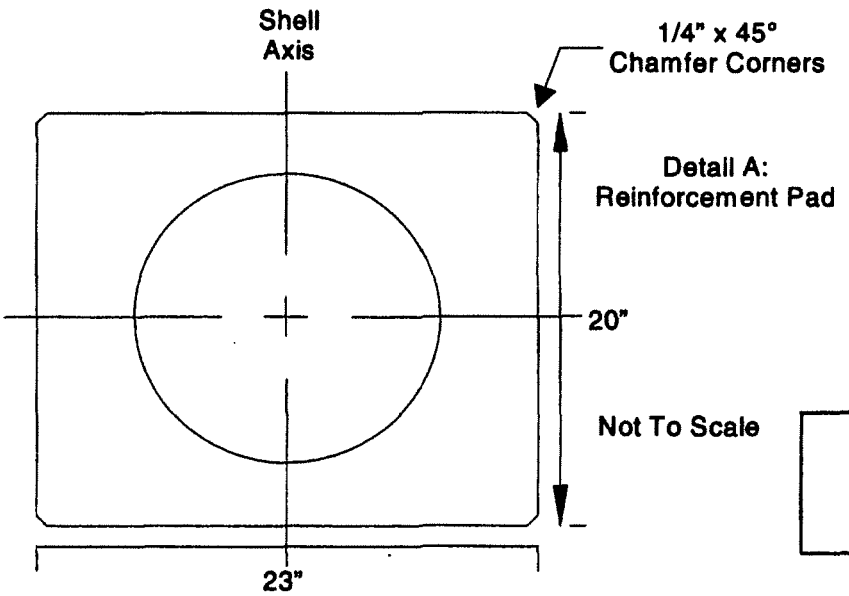

FIGURE 1:
RHR Vessel/Nozzle
Configuration

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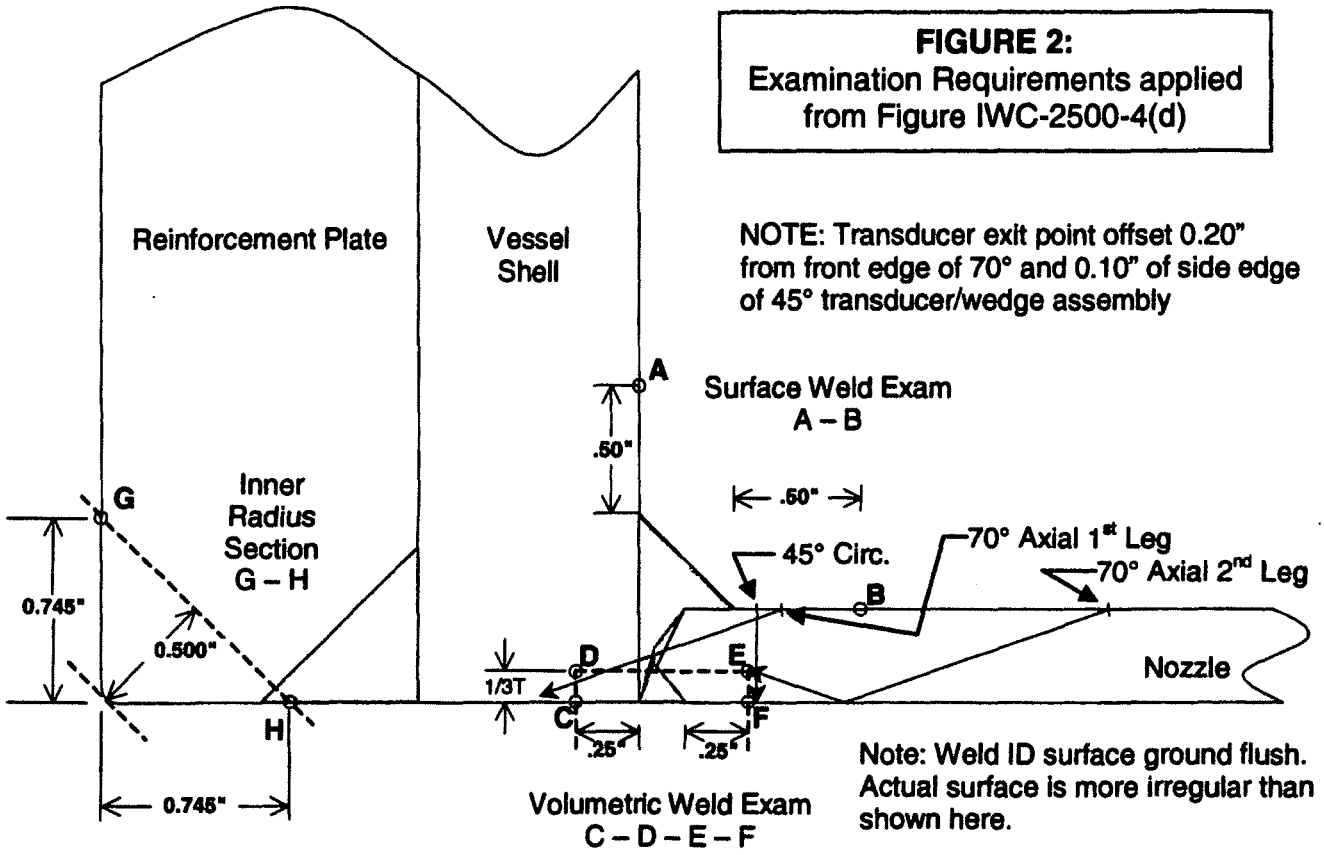

FIGURE 2:
Examination Requirements applied from Figure IWC-2500-4(d)

TABLE 1: Estimated Coverage of Ultrasonic Examination

*45° Shear Circumferential: Clockwise	0.00%
*45° Shear Circumferential: Counter-Clockwise	0.00%
70° Shear Axial: Nozzle-to-Shell Direction	96.51%
**70° Shear Axial: Shell-to-Nozzle Direction (using Shell-side 2nd leg of beam)	100.00%
Accumulative Coverage	49.13%
*Due to the size of the fillet weld, the circumferential beam is unable to acquire the examination volume. Transducer exit point is beyond the E – F side of the examination volume.	
**The equivalent to a Shell-to-Nozzle direction is achieved using the reflected 2nd leg of the Nozzle-to-Shell scan.	
The required volume for the Inner Radius Section cannot be achieved from the outside surface of the vessel. The interface between the vessel shell and inside reinforcement plate will not transmit the ultrasonic beam.	

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Request for Relief for Alternative Requirements for the Limited Surface Examination of Centrifugal Charging (CV) Pumps, Containment Spray Pumps, and Residual Heat Removal Pumps Attachment Welds In Accordance with 10 CFR 50.55a(a)(3)(i)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	2
Reference:	IWC-2500, Table IWC-2500-1
Examination Category:	C-C
Item Number:	C3.30
Description:	Limited Surface Examination of Centrifugal Charging (CV) Pumps, Containment Spray Pumps, and Residual Heat Removal Pumps Attachment Welds
Component Numbers:	1/2CS-01-PA & 1/2CS-01-PB, CSP E-01, CSP E-02, and CSP E-03 1/2CV-01-PA & 1/2CV-01-PB, CVP E-01, CVP E-02, CVP E-03, and CVP E-04 1/2RH-01-PA & 1/2RH-01-PB, RHP E-01, RHP E-02, and RHP E-03
Drawing Numbers:	1VCT-1-ISI (Unit 1) and 2VCT-1-ISI (Unit 2) for CS Pumps 1RHP-1-ISI (Unit 1) and 2RHP-1-ISI (Unit 2) for CV and RH Pumps

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

Table IWC-2500-1, Examination Category C-C, Item Number C3.30 requires a 100% surface examination of pump welded attachments per Examination Figure IWC-2500-5.

4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative would provide an acceptable level of quality and safety.

Due to the design of the Centrifugal Charging Pumps, Containment Spray Pumps, and Residual Heat Removal Pumps support lugs, portions of the associated attachment

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welds are inaccessible for the code required surface examination. The inaccessible areas are shown in Figures 1 and 2. As detailed in these figures, the portion of the subject weld within the recess between the pumps and the support lug does not provide sufficient clearance to perform a surface examination. The concrete support pedestal also limits access to lower portions of the attachment weld. These obstructions can not be removed without destructive activities or redesigning the pump supports.

Because the subject welds are not full penetration welds, performance of an alternative visual (VT-1), examination on the inaccessible weld length (in addition to the required surface exams) will provide satisfactory assurance of the structural integrity of these welds. In addition, a VT-2 examination during system pressure testing per Examination Category C-H will also be performed on the Centrifugal Charging Pumps, Containment Spray Pumps, and Residual Heat Removal Pumps each inspection period to verify leak tight integrity of these components. Based on this information, reasonable assurance of the continued inservice structural integrity of the subject welds will be achieved.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

The Code required surface examination will be performed on the accessible portions of the subject welds. In addition, a visual, VT-1 examination will be performed on the portions of the subject welds that are inaccessible for surface examination.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

Similar relief requests have been approved for:

Byron Station Second Inspection Interval Relief Request I2R-06 was authorized per SER dated 1/13/98.

Byron Station First Inspection Interval Relief Request NR-13 was granted per SER dated 12/6/91.

Braidwood Station Second Inspection Interval Relief Request I2R-02 was authorized per SER dated 1/6/00.

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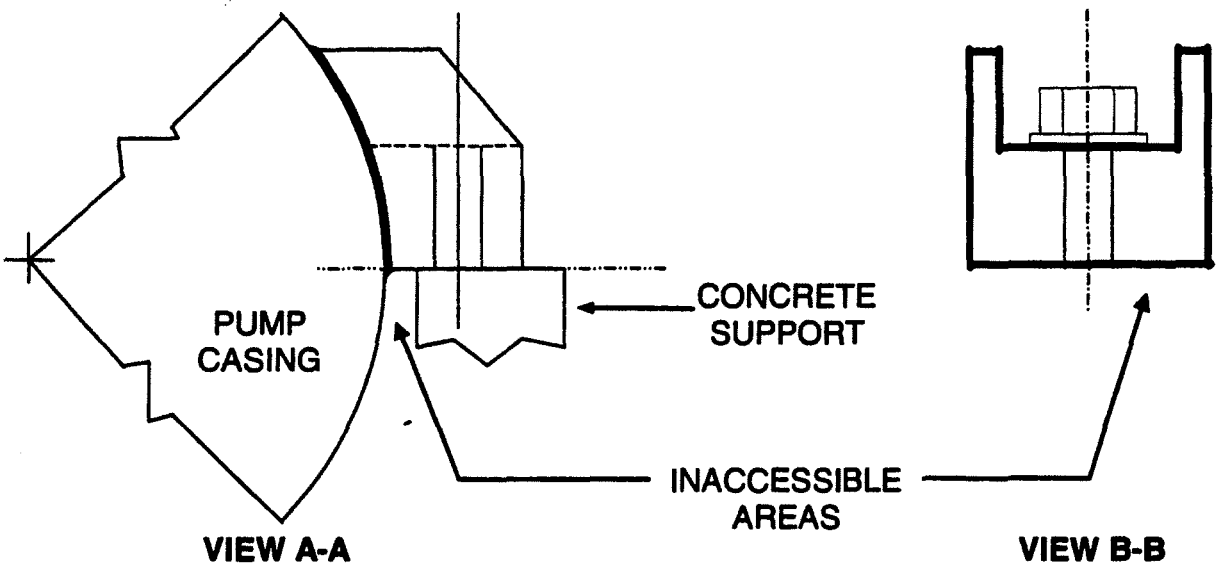

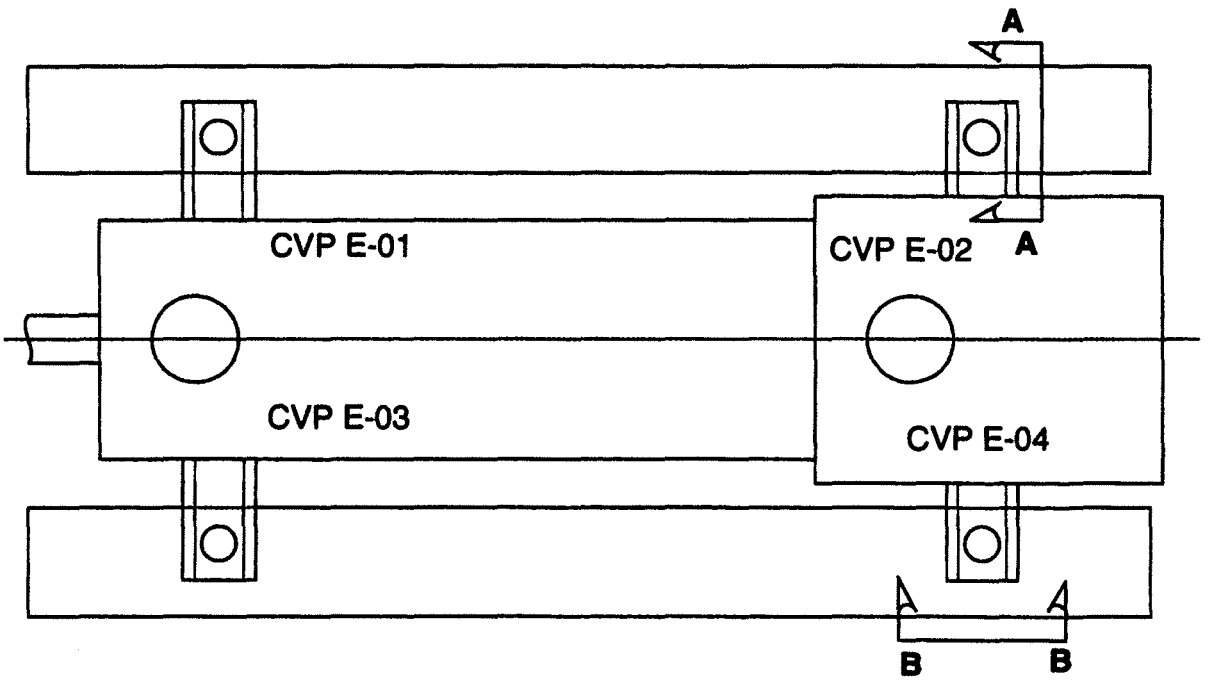

FIGURE 1: CV Pump Attachment Welds

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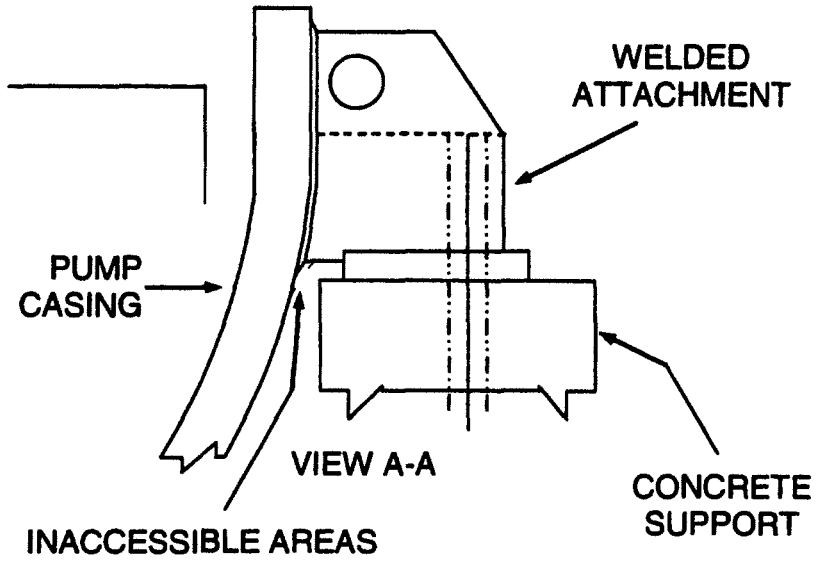

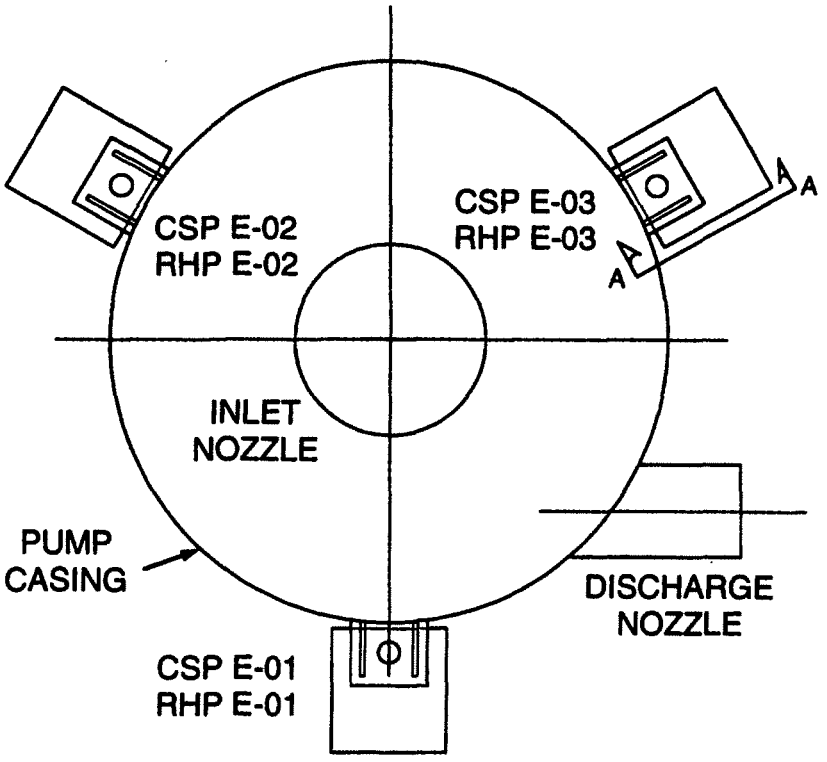

FIGURE 2: CS and RH Pump Attachment Welds

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Request for Relief for Alternative Requirements to the Repair/Replacement of Control Rod Drive Mechanism (CRDM) Canopy Seal Welds in Accordance with IWA-4000 In Accordance with 10 CFR 50.55a(a)(3)(i)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	1
Reference:	IWA-4000
Examination Category:	N/A
Item Number:	N/A
Description:	Repair/Replacement of Control Rod Drive Mechanism (CRDM) Canopy Seal Welds in Accordance with IWA-4000
Component Number:	Reactor CRDM Canopy Seal Welds - Class 1 Appurtenance to the Reactor Vessel.

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

The CRDM assemblies were designed and fabricated to the ASME Section III, 1974 Edition through summer, 1974 Addenda.

IWA-4000 of ASME Section XI requires that repairs be performed in accordance with the owner's original construction Code of the component or system, or later editions and addenda of the Code. The canopy seal weld is described in Section III and a repair to this weld would require the following activities:

a. Excavation of the rejectable indications,

b. A surface examination of the excavated areas,

c. Re-welding and restoration to the original configuration and materials, and

d. Final surface examination.

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4.0 REASON FOR REQUEST:

The principal issues leading to this relief request are the excavation of the existing weld, the accompanying radiation dose received during the excavation and examination activities, and the weld material used for the repair or replacement.

Due to the nature of the flaw, the excavation of the leaking portion of the weld would necessitate a cavity that extends completely through wall. A liquid penetrant examination (PT) of this cavity is required to verify the removal of the rejectable flaw or to verify that the flaw is removed or reduced to an acceptable size. This PT examination would deposit the penetrant materials onto the inner surfaces of the component. This material would not be readily removable prior to re-welding due to the inaccessibility of the inside surface. The remaining penetrant material would introduce contaminants to the new weld metal and reduce the quality of the repair weld. The configuration of the canopy assembly would prevent the establishment and maintenance of an adequate back-purge during the welding process and would further reduce the quality of the repaired weld.

The CRDM canopy seal welds are located above the reactor vessel closure head, which is highly congested and subject to high radiation levels. The high radiological dose associated with strict compliance to these requirements would be contrary to the intent of the as low as reasonably achievable (ALARA) radiological controls program. Most of the repair activities would be performed remotely using robotic equipment. This will reduce the radiation exposure to personnel involved in the welding process. However, the required excavation and PT examinations would necessitate hands-on access to the canopy weld and are estimated to result in a total occupational radiation dose of 1.688 person-Rem per CRDM canopy seal weld. The excavation and PT examinations are activities that would not be required if granted relief from these requirements and, thus, represent the estimated occupational radiation dose savings. This dose estimate is comprised of the following:

ACTIVITY	DOSE (PERSON-REM)
MANUAL EXCAVATION OF FLAWS	
Access/egress to perform the excavation (0.035 per trip, 1 trip required)	0.035
Performance of the excavation (total residence time of five minutes)	0.090
PT OF EXCAVATED AREAS	
Access/egress to perform the examination (0.035 per trip, 5 trips required)	0.175
Performance of the PT examination (total residence time of ten minutes)	0.180
FINAL PT OF NEW WELD	
Access/egress to perform the examination (0.035 per trip, 5 trips required)	0.175
Performance of the PT examination (total residence time of ten minutes)	0.180
TOTAL EXPOSURE FOR ALL ACTIVITIES	**0.835**
Dose estimates are based on survey #02-2489, dated 9/20/02 performed on the Byron Station Unit 2 head canopy area.	

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IWA-4200 requires that the repair material conform to the original design specification or Section III. In this case, the replacement material would have the same resistance to stress corrosion cracking as the original material. Use of the original material does not guarantee that the repaired component will continue to maintain leakage integrity throughout the intended life of the item.

Applicable portions of ASME Code Case N-504-2, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping Section XI, Division 1," will be used as guidance for repair by weld overlay to provide a new leakage barrier. In lieu of performance of PT examinations of CRDM seal weld repairs or replacement, a 5X or better magnification visual examination will be performed after the welding is completed. In addition, Alloy 52 nickel-based weld repair material will be used rather than austenitic stainless steel as required by Code Case N-504-2.

Alloy 52 nickel-based weld repair material was selected rather than austenitic stainless steel for the repair because of its resistance to stress corrosion cracking. Consequently, the ferrite requirements of Code Case N-504-2 do not apply. The suitability of the replacement material has been evaluated and is determined to be compatible with the existing component and will provide a leakage barrier for the remainder of the intended life of the CRDM.

The alternative method of repair is being requested to facilitate contingency repair efforts during future outages within the third ten-year inservice inspection interval. The alternative nondestructive examination method is being requested to facilitate examination of either a repair or replacement of a CRDM canopy seal weld during the third ten-year inservice inspection interval.

Industry experience with failure analyses performed on leaking canopy seal welds removed from service at other plants has attributed the majority of the cases to transgranular stress corrosion cracking (SCC). The size of the opening where the leakage occurs has been extremely small, normally a few thousandths of an inch. The crack orientations vary, but often radiate outward such that a pinhole appears on the surface, as opposed to a long crack. The SCC results from exposure of a susceptible material to residual stress, which is often concentrated by weld discontinuities, and to a corrosive environment. A corrosive environment can form with water being trapped in the cavity behind the seal weld that is mixed with air initially in the cavity, resulting in a higher oxygen content than is in the bulk primary coolant.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

Following the guidance of Code Case N-504-2, the CRDM canopy seal weld flaws will not be removed, but an analysis of the repaired weldment has been performed using Paragraph (g) of the Code Case as guidance to assure that the remaining flaw will not propagate unacceptably. The canopy seal weld is not a structural weld, nor a pressure-retaining weld, but provides a seal to prevent reactor coolant leakage if the mechanical joint leaks. The weld buildup is considered a repair in accordance with

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IWA-4110. Applicability of the original Code of construction or design specification is mandated because the weld is performed on an appurtenance to a pressure-retaining component. The alternative CRDM canopy seal weld repair uses a gas tungsten arc welding (GTAW) process controlled remotely.

A visual examination of the repaired/replaced weld will be performed using methods and personnel qualified to the standards of ASME VT-1 requirements. The visual examination will be performed using the welding equipment video camera with 5X or better magnification within several inches of the weld, qualified to ensure identification of flaws to assure an adequate margin of safety is maintained. The examination technique will be demonstrated to resolve a 0.001" thick wire against the surface of the weld. The repaired/replaced weld will be examined for quality of workmanship and discontinuities will be evaluated and dispositioned to ensure the adequacy of the new leakage barrier.

The automated GTAW weld repair and alternate VT-1 examination methods result in significantly lower radiation exposure because the equipment is remotely operated after setup. A post-maintenance pressure test (VT-2) at nominal temperature and pressure will be performed.

Repair/replacement activities, using the process described in this relief request, shall be documented on the required NIS-2 / NIS-2A forms. This relief request will be identified on the NIS-2 / NIS-2A forms in lieu of an adopted or invoked ASME Code Case. The repair documents will be reviewed by the Authorized Nuclear Inspector, and maintained in accordance with the requirements for archiving permanent plant records.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

Similar relief requests have been approved for:

Exelon Corporation's Byron Nuclear Plant, by letter dated September 16, 2003;

Carolina Power and Light Company's Shearon Harris Nuclear Power Plant, by letter dated November 6, 1998;

Northern States Power's Prairie Island Nuclear Generating Station, by letter dated January 22, 1999;

Tennessee Valley Authority's (TVA) Watts Bar Nuclear Plant, by letter dated August 25, 1999;

TVA's Sequoyah Nuclear Plant, by letter dated September 12, 2000;

Pacific Gas & Electric's Diablo Canyon Power Plant, by letter dated June 5, 2001; and

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STP Nuclear Operating Company's South Texas Project Electric Generating Station, by letter dated November 5, 2002.

9.0 REFERENCES

The references used to develop this Inservice Inspection Program Plan include:

1. Code of Federal Regulations, Title 10.
Part 50, Paragraph 2, *Definitions*, the definition of "Reactor Coolant Pressure Boundary".
Part 50, Paragraph 50.55a, *Codes and Standards.*
Part 50, Appendix J, Option B.

SECY-96-080, Issuance of Final Amendment To 10 CFR 50.55a To Incorporate By Reference The ASME Boiler And Pressure Vessel Code, Section XI, Division 1, Subsection IWE and IWL.

2. ASME Boiler and Pressure Vessel Code, Section XI, Division 1, *Inservice Inspection of Nuclear Power Plant Components*,
1989 Edition with No Addenda.
1995 Edition through the 1995 Addenda
1995 Edition through the 1997 Addenda
1998 Edition with No Addenda
2001 Edition with No Addenda
2001 Edition through the 2003 Addenda.

3. ASME Boiler and Pressure Vessel Code, Section III, Division 1, *Rules For Construction of Nuclear Power Plant Components*,
2001 Edition through the 2003 Addenda.

4. ASME OM Code, *Code For Operation and Maintenance of Nuclear Power Plants*,
2001 Edition through the 2003 Addenda.

5. USAS B31.1.0-1967, *Power Piping.*

6. Regulatory Guide 1.26, Revision 3, *Quality Group Classifications and Standards for Water-, Steam-, and Radioactive Waste- Containing Components of Nuclear Power Plants.*

7. Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*

8. Regulatory Guide 1.192, *Operation and Maintenance Code Case Acceptability, ASME OM Code*

9. NRC letter dated May 17, 1990, Stephen P. Sands, NRC to Thomas J. Kovach, Commonwealth Edison Company- Safety Evaluation of Containment Leak Chase Channels-Byron Station Unit Nos. 1 and 2, Braidwood Station Unit Nos. 1 and 2.

10. Byron Station Units 1 and 2 Updated Final Safety Analysis Report (UFSAR).

11. Byron Station Technical Specifications, Limiting Conditions for Operation and Surveillance Requirements, with Amendments through Number 108.

12. Byron Station Technical Specifications, Bases.

13. Byron Station Technical Requirements Manual.

14. NRC NUREG 0737, dated November 1980, *Clarification of TMI Action Plan Requirements.*

15. Byron Station Procedures.

16. Exelon Corporate Procedures.

17. Byron Station Units 1 and 2 ISI Classification Basis Document Third Ten-Year Inspection Interval.

18. Byron Station Units 1 and 2 ISI Selection Document Third Ten-Year Inspection Interval.

19. Branch Technical Position MEB 3-1, dated November 24, 1975, *High Energy Fluid Systems, Protection Against Postulated Piping Failures in Fluid Systems Outside Containment.*

20. Regulatory Guide 1.14, Revision 1, *Reactor Coolant Pump Flywheel Integrity.*

21. Regulatory Guide 1.137, Revision 1, *Fuel-Oil Systems for Standby Diesel Generators.*

22. EPRI Topical Report TR-112657, Rev. B-A, Final Report, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, December 1999.

23. NRC SER related to EPRI Topical Report TR-112657, Rev. B, Final Report, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, July 1999, dated October 28, 1999.

24. ComEd Risk-Informed Inservice Inspection Project *Definition of RISI Scope for Byron Station Units 1 and 2*, dated April 17, 2000.

25. ComEd Risk-Informed Inservice Inspection Evaluation (Final Report) for Byron Station Units 1 and 2, dated August 8, 2000.

26. EPRI Topical Report TR-1006937, Rev. 0-A, "Extension of the EPRI Risk-Informed Inservice Inspection (RI-ISI) Methodology to Break Exclusion Region (BER) Programs", August 2002.

27. NRC SER related to EPRI Topical Report TR-1006937, Rev. 0, "Extension of the EPRI Risk-Informed Inservice Inspection (RI-ISI) Methodology to Break Exclusion Region (BER) Programs", dated June 27, 2002.

28. ER-AA-330, "Conduct of Inservice Inspection Activities"

29. ER-AA-330-001, "Section XI Pressure Testing"

30. ER-AA-330-002, "Inservice Inspection of Welds and Components"

31. ER-AA-330-003, "Visual Examination of Section XI Component Supports"

32. ER-AA-330-004, "Visual Examination of Technical Specification Snubbers"

33. ER-AA-330-005, "Visual Examination of Section XI Class CC Concrete Containment Structures"

34. ER-AA-330-006, "Inservice Inspection and Testing of The Pre-Stressed Concrete Containment Post Tensioning Systems"

35. ER-AA-330-007, "Visual Examination of Section XI Class MC Surfaces and Class CC Liners"

36. ER-AA-330-009, "ASME Section XI Repair/Replacement Program"

37. ER-AA-330-010, "Snubber Functional Testing"

38. ER-AA-330-011, "Snubber Service Life Monitoring Program"