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March 25, 2009  
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10 CFR 50.55a

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

Braidwood Station, Units 1 and 2  
Facility Operating License Nos. NPF-72 and NPF-77  
NRC Docket Nos. 50-456 and 50-457

Subject: Submittal of Third Inservice Inspection (ISI) Interval Program Plan

In accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, IWA-1400(c), "Owner's Responsibility," attached for your information is a copy of the Third Ten-Year Interval Inservice Inspection (ISI) Program Plan for Braidwood Station, Units 1 and 2, not including relief requests. Relief requests associated with the program are being submitted separately. The third interval of the Braidwood Station, Units 1 and 2 ISI Program complies with the 2001 Edition through 2003 Addenda of the ASME B&PV Code.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this letter, please contact Mr. David Gullott, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,



Bryan Hanson  
Site Vice President  
Braidwood Station

Attachment: Braidwood Nuclear Power Station, Units 1 & 2 ISI Program Plan Third  
Ten-Year Inspection Interval

cc: NRC Regional Administrator, Region III  
NRC Senior Resident Inspector – Braidwood Station  
Illinois Emergency Management Agency – Division of Nuclear Safety

**ATTACHMENT**

**Braidwood Nuclear Power Station, Units 1 & 2  
ISI Program Plan Third Ten-Year Inspection Interval**

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**BRAIDWOOD NUCLEAR POWER STATION  
UNITS 1 & 2**

**ISI PROGRAM PLAN  
THIRD TEN-YEAR INSPECTION INTERVAL**

**Commercial Service Dates:**

**Unit 1 – 07/29/88**

**Unit 2 – 10/17/88**

**Braidwood Nuclear Power Station  
35100 S. Rt. 53, Suite 84  
Braceville, Illinois 60407**

**Exelon Generation Company (EGC), LLC  
300 Exelon Way  
Kennett Square, PA 19348**

ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval

**REVISION APPROVAL SHEET**

TITLE:       ISI Program Plan  
              Third Ten-Year Inspection Interval  
              Braidwood Nuclear Power Station, Units 1 & 2

DOCUMENT:    ISI Program Plan                               REVISION:   0

EXELON PREPARATION, REVIEW, AND APPROVAL

REVIEWED: Brendan J. Casuy / 8/8/2008, 12/3/2008\*  
                  Inservice Inspection Program Owner / Date

REVIEWED: Tom Johns / 11/19/2008  
                  Component Support/Stubber Program Owner / Date

REVIEWED: [Signature] / 08/13/2008  
                  Pressure Testing Program Owner / Date

REVIEWED: [Signature] / 8-11-08  
                  Steam Generator Program Owner / Date

REVIEWED: Tom Johns / 11/19/2008  
                  Containment Inspection (IWE) Program Owner / Date

REVIEWED: Tom Johns / 11/19/2008  
                  Concrete Inspection (IWL) Program Owner / Date

REVIEWED: Tom B. [Signature] / 12-2-08  
                  Responsible Individual (IWE-2320) / Date

REVIEWED: Tom B. [Signature] / 12-2-08  
                  Responsible Engineer (IWL-2320) / Date

APPROVED: [Signature] / 12-08-08  
                  Engineering Programs Manager/Date

RECEIPT  
ACKNOWLEDGED [Signature] / 12/08/08  
                  Authorized Nuclear Inservice Inspector (ANII)/Date

\* Incorporated requirements mandated in 10CFR 50.55a effective 10/10/2008.

**REVISION CONTROL SHEET**

Major changes should be outlined within the table below. Logging of minor editorial and formatting revisions is not required.

<b>Revision</b>	<b>Date</b>	<b>Revision Summary</b>	<b>Reviewed By</b>	<b>Approved By</b>
0	12//8/2008	Initial issuance.	See Previous Page	

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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, containment structures, and post-tensioning systems at Braidwood Nuclear Power Station (Braidwood Station), Units 1, 2, and Common (0). Unit Common components are included in the Unit 1 sections, reports, and tables. The ISI Program Plan also includes Containment Inservice Inspection (CISI), Risk-Informed Inservice Inspection (RISI), Augmented Inservice Inspection (AUG), and System Pressure Testing (SPT) requirements imposed on or committed to by Braidwood Station. At Braidwood 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 IST 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 Braidwood 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 Braidwood Station Flow Accelerated Corrosion (FAC) Inspection 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 Third ISI Interval is effective from July 29, 2008 through July 28, 2018 for Braidwood Station Unit 1 and effective from October 17, 2008 through October 16, 2018 for Braidwood Station Unit 2 for Class 1, 2, and 3 components, including their supports. The Second CISI Program is also effective from July 29, 2008 through July 28, 2018 for Braidwood Station Unit 1 and effective from October 17, 2008 through October 16, 2018 for Braidwood Station Unit 2 for Class MC and CC components. This update will enable all of the ISI and CISI 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. The common ASME Code of Record for the Third ISI Interval and the Second CISI Interval is the 2001 Edition through the 2003 Addenda.



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**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

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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.

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

The inspection of ASME Class CC Components and Surfaces for the Second CISI Interval shall be performed in accordance with IWL-2410 and IWL-2420. Table 1.1-3 identifies the inspection schedule.

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 1.1-1**

**UNITS 1 & 2 THIRD 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
A1R14 <sup>1</sup> (3-1-1)	Scheduled April 2009	1 <sup>st</sup> 7/29/08 to 7/28/11	3 <sup>rd</sup> (Unit 1) 7/29/08 to 7/28/18  3 <sup>rd</sup> (Unit 2) 10/17/08 to 10/16/18	1 <sup>st</sup> 10/17/08 to 10/16/11	Scheduled October 2009	A2R14 (3-1-1)
A1R15 (3-1-2)	Scheduled October 2010				Scheduled April 2011	A2R15 (3-1-2)
A1R16 (3-2-1)	Scheduled April 2012	2 <sup>nd</sup> 7/29/11 to 7/28/15		2 <sup>nd</sup> 10/17/11 to 10/16/15 <sup>2</sup>	Scheduled October 2012	A2R16 (3-2-1)
A1R17 (3-2-2)	Scheduled October 2013				Scheduled April 2014	A2R17 (3-2-2)
A1R18 (3-2-3)	Scheduled April 2015				Scheduled October 2015 <sup>2</sup>	A2R18 (3-2-3)
A1R19 (3-3-1)	Scheduled October 2016	3 <sup>rd</sup> 7/29/15 to 7/28/18		3 <sup>rd</sup> 10/17/15 to 10/16/18	Scheduled April 2017	A2R19 (3-3-1)
A1R20 (3-3-2)	Scheduled April 2018		Scheduled October 2018		A2R20 (3-3-2)	

Note 1: A1R14 includes second interval inspections that were extended from A1R13 as permitted by IWB-2412(b) of the 1989 Edition.

Note 2: Period end date will be modified as permitted by IWA-2430(d)(3) to allow A2R18 to remain within the second period.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 1.1-2**

**UNITS 1 & 2 SECOND CISI INTERVAL/PERIOD/OUTAGE MATRIX**  
**(FOR CISI 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
A1R14 (2-1-1)	Scheduled April 2009	1 <sup>st</sup> 7/29/08 to 7/28/11	2 <sup>nd</sup> (Unit 1) 7/29/08 to 7/28/18 <sup>1</sup>  2 <sup>nd</sup> (Unit 2) 10/17/08 to 10/16/18 <sup>1</sup>	1 <sup>st</sup> 10/17/08 to 10/16/11	Scheduled October 2009	A2R14 (2-1-1)
A1R15 (2-1-2)	Scheduled October 2010				Scheduled April 2011	A2R15 (2-1-2)
A1R16 (2-2-1)	Scheduled April 2012	2 <sup>nd</sup> 7/29/11 to 7/28/15		2 <sup>nd</sup> 10/17/11 to 10/16/15 <sup>2</sup>	Scheduled October 2012	A2R16 (2-2-1)
A1R17 (2-2-2)	Scheduled October 2013				Scheduled April 2014	A2R17 (2-2-2)
A1R18 (2-2-3)	Scheduled April 2015				Scheduled October 2015 <sup>1</sup>	A2R18 (2-2-3)
A1R19 (2-3-1)	Scheduled October 2016	3 <sup>rd</sup> 7/29/15 to 7/28/18		3 <sup>rd</sup> 10/17/15 to 10/16/18	Scheduled April 2017	A2R19 (2-3-1)
A1R20 (2-3-2)	Scheduled April 2018		Scheduled October 2018		A2R20 (2-3-2)	

Note 1: Period end date will be modified as permitted by IWA-2430(d)(3) to allow A2R18 to remain within the second period.

**TABLE 1.1-3**  
**UNITS 1 & 2 SECOND CISI INTERVAL**  
**(FOR CISI CLASS CC CONCRETE SURFACE AND TENDON EXAMINATIONS)**

Year	Unit 1		Unit 2	
	Concrete Surface Examinations (Scope)	Concrete Tendon Examinations (Scope)	Concrete Surface Examinations (Scope)	Concrete Tendon Examinations (Scope)
2011 (25 <sup>th</sup> Year)	In accordance with IWL-2510	Only examinations required by IWL-2510(c), IWL-2524, and IWL-2525	In accordance with IWL-2510	All examinations required by IWL-2500
2016 (30 <sup>th</sup> Year)	In accordance with IWL-2510	All examinations required by IWL-2500	In accordance with IWL-2510	Only examinations required by IWL-2510(c), IWL-2524, and IWL-2525
2021 (35 <sup>th</sup> Year)	In accordance with Third Interval Requirements	In accordance with Third Interval Requirements	In accordance with Third Interval Requirements	In accordance with Third Interval Requirements

Note 1: With the exception of some dome tendon anchorages, which are considered not accessible due to safety hazards, all Braidwood Class CC components and concrete surfaces are accessible for examination during operational periods. In the event one or more of the inaccessible dome tendons anchorages are selected under IWL-2521, the requirements of IWL-2521.1, "Exemptions", shall be applied. Completion of ASME Class CC examinations for Braidwood Units 1 and 2 is not outage dependent.

Note 2: Braidwood Units 1 and 2 meet the requirements of ASME Section XI, IWL-2421, "Sites with Multiple Plants". The Unit 1 and 2 containments utilize the same pre-stressing system, are essentially identical in design, were constructed within two years, and are similarly exposed to and protected from the outside environment.

Note 3: The requirements of 10 CFR 50.55a(b)(2)(viii) paragraphs (E), (F), and (G) shall be applied to examinations and tests performed in accordance with ASME Section XI, Subsection IWL.

## 1.2 Background

The Commonwealth Edison Company, now known commercially as Exelon Generation Company (EGC) or Exelon, obtained Construction Permits to build Braidwood Station Units 1 and 2 on December 31, 1975, for Unit 1, CPPR-132, and for Unit 2, CPPR-133. The Docket Numbers assigned to Braidwood Station are STN 50-456 for Unit 1 and STN 50-457 for Unit 2. After satisfactory plant construction and preoperational testing was completed, Braidwood Station was granted a full power operating license for Unit 1, NPF-72, on July 2, 1987 and subsequently commenced commercial operation on July 29, 1988; the full power operating license for Unit 2, NPF-77, was granted on May 20, 1988 and commercial operation commenced on October 17, 1988.

Braidwood 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 criteria cannot be met, a relief request will be submitted in accordance with 10 CFR 50.55a.

## 1.3 First Interval ISI Program

Pursuant to the Code Of Federal Regulations (CFR), Title 10, Part 50, Section 55a, *Codes and standards*, (10 CFR 50.55a), Braidwood Station was required to meet the requirements of Paragraph (g), *Inservice inspection requirements*, of that section.

Specifically, Paragraph 10 CFR 50.55a(g)(4)(i) called for the Inservice Inspection requirements of the 120 month inspection interval to comply with the requirements of the latest Edition and Addenda of ASME Section XI referenced in Paragraph (b) of 10 CFR 50.55a on the date 12 months prior the date of issuance of the operating license, subject to the limitations and modifications listed in 10 CFR 50.55a(b).

The version of 10 CFR 50.55a in effect 12 months prior to the issuance of the Braidwood Station Unit 1 and Unit 2 operating license referenced ASME Section XI, 1983 Edition with Addenda through the Summer 1983 Addenda (83/S83) of the ASME Boiler and Pressure Vessel (B&PV) Code, ASME Section XI, titled Rules for Inservice Inspection of Nuclear Power Plant Components in Paragraph (b)(2). The inservice inspection

requirements applicable to nondestructive examination and system pressure testing for the First ISI Program were based on these rules. The extent of the application of ASME Section XI 83/S83 was limited by Paragraph (2)(iv)(A) such that ASME Section XI, 1974 Edition with Addenda through Summer 1975 Addenda (74/S75) must be utilized for ASME Code Class 2 pressure retaining welds in Residual Heat Removal Systems, Emergency Core Cooling Systems, and Containment Heat Removal Systems. Optionally, per Paragraph (2)(iv)(B), plants with Construction Permits docketed prior to July 1, 1978, such as Braidwood Station, could use ASME Section XI 74/S75 to examine ASME Code Class 2 pressure retaining welds in systems other than those in Paragraph (2)(iv)(A). Based on these 10 CFR 50.55a mandatory and optional requirements, the Braidwood Station ASME Section XI ISI Program Plan for the initial ten year interval was developed by Braidwood Station.

The Braidwood Station first ISI interval started on July 29, 1988 and ended on July 28, 1998 for Unit 1, and started on October 17, 1988 and ended on October 16, 1998 for Unit 2.

#### 1.4 Second Interval ISI Program

Pursuant to 10 CFR 50.55a(g), Exelon was required to update the ISI Program at the end of the first ISI interval. The ISI Program was required to comply with the latest Edition and Addenda of the ASME Section XI incorporated by reference in 10 CFR 50.55a twelve months prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii).

The second interval ISI Program Plan was developed in accordance with the requirements of 10 CFR 50.55a and the 1989 Edition, No Addenda of ASME Section XI. Where portions of other Codes were implemented, as allowed by 10 CFR 50.55a, those specific Codes were applied. The ISI Program Plan addressed Subsections IWA, IWB, IWC, IWD, and IWF of ASME Section XI, and complied with the requirements of Inspection Program B as defined therein.

The Braidwood Station Unit 1 second ISI interval started on July 29, 1998 and was scheduled to end on July 28, 2008. The Braidwood Station Unit 2 second ISI interval was effective from October 17, 1998 through October 28, 2008 in accordance with the original pattern of intervals. As allowed by IWA-2430(d)(1), Braidwood Station Unit 1 took a 1 year extension for the Second ISI Interval until July 28, 2009. This extension will not affect the start of the Third ISI Interval for Unit 1. Braidwood Station Unit 1 extended the Second ISI Interval in order to complete the Second ISI Interval examinations (Examination Category B-P). Third ISI Interval examinations may also be performed during this time period, but in no case will a single examination be credited for both intervals.

The Braidwood Station Second ISI Interval was effective from July 29, 1998 through July 28, 2009 for Unit 1, and from October 17, 1998 through October 16, 2008 for Unit 2.

#### 1.5 Third Interval ISI Program

Pursuant to 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 ASME Section XI incorporated by reference in 10 CFR 50.55a twelve months prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii). The start of the Braidwood Station third ISI interval will be on July 29, 2008 for Unit 1, and October 17, 2008 for Unit 2 in accordance with the original pattern of intervals. Based on this date, the latest Edition and Addenda of the ASME Section XI referenced in 10 CFR 50.55a(b)(2) twelve months prior was the 2001 Edition through the 2003 Addenda.

The Braidwood Station third interval ISI Program Plan was developed in accordance with the requirements of 10 CFR 50.55a 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. These limitations and modifications are detailed in Table 1.8-1 of this section. This ISI Program Plan addresses Subsections IWA, IWB, IWC, IWD, IWF, Mandatory Appendices, approved ASME Code Cases, approved alternatives through relief requests and Safety Evaluation Reports (SER's), and utilizes Inspection Program B as defined therein.

Braidwood Station 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. The RISI Program will be in effect for the entire Third ISI Interval. This approach replaces the categorization, selection, and examination volume requirements for portions of ASME Section XI Examination Categories B-F, B-J, C-F-1, and C-F-2 applicable to Braidwood Station with Examination Category R-A as defined in Code Case N-578-1. Implementation of the RISI Program is in accordance with Relief Request I3R-01.

Braidwood 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 was made under 10 CFR 50.59 evaluation criteria. The RISI evaluation for BER piping remains in effect for the third ISI interval.

1.6 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 through 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).

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 CISI 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 developed to implement these requirements. The first CISI interval was effective from July 29, 1998 through July 28, 2008 for Braidwood Station Unit 1, and from October 17, 1998 through October 16, 2008 for Braidwood Station Unit 2. The CISI Program Plan was developed and implemented prior to the required date, and examinations were performed in accordance with the first CISI Interval schedule.

1.7 Second Interval CISI Program

Pursuant to 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 ASME Section XI incorporated by reference in 10 CFR 50.55a twelve months prior to the start of the interval per 10 CFR 50.55a(g)(4)(ii). The start of the second CISI interval is July 29, 2008 for Braidwood Station Unit 1, and October 17, 2008 for Braidwood Station Unit 2. Based on this date, the latest Edition and Addenda of ASME Section XI referenced in 10 CFR 50.55a(b)(2) twelve months prior was the 2001 Edition through the 2003 Addenda.

The Braidwood Station Second CISI Interval will be effective from July 29, 2008 through July 28, 2018 for Unit 1, and from October 17, 2008 through October 16, 2018 for Unit 2 in accordance with the original pattern of intervals.



The Braidwood Station second interval CISI Program Plan was developed in accordance with the requirements of 10 CFR 50.55a 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 1.8-1 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.

1.8 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 that are applicable to Braidwood Station are detailed in Table 1.8-1.

**TABLE 1.8-1**  
**CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(2)(viii)(E)	<p><i>Examination of concrete containments:</i> 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:</p> <ol style="list-style-type: none"> <li>(1) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;</li> <li>(2) An evaluation of each area, and the result of the evaluation, and;</li> <li>(3) A description of necessary corrective actions.</li> </ol>
10 CFR 50.55a(b)(2)(viii)(F)	<p><i>Examination of concrete containments:</i> 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.</p>
10 CFR 50.55a(b)(2)(viii)(G)	<p><i>Examination of concrete containments:</i> 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.</p>
10 CFR 50.55a(b)(2)(ix)(A)	<p><i>Examination of metal containments and the liners of concrete containments:</i> 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:</p> <ol style="list-style-type: none"> <li>(1) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;</li> <li>(2) An evaluation of each area, and the result of the evaluation, and;</li> <li>(3) A description of necessary corrective actions.</li> </ol>

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(2)(ix)(B)	<i>Examination of metal containments and the liners of concrete containments:</i> 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)	<i>Examination of metal containments and the liners of concrete containments:</i> 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)	<i>Examination of metal containments and the liners of concrete containments:</i> 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 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(2)(ix)(H)	<i>Examination of metal containments and the liners of concrete containments:</i> 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)	<i>Examination of metal containments and the liners of concrete containments:</i> 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)(xii)	<i>Underwater Welding:</i> 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.
10 CFR 50.55a(b)(2)(xv)	<i>Appendix VIII specimen set and qualification requirements.</i> The provisions of 50.55a(b)(2)(xv)(A) through 50.55a(B)(2)(xv)(M) may be used to modify implementation of Appendix VIII of Section XI, 1995 Edition through the 2001 Edition. Licensees choosing to apply these provisions shall apply all provisions under this paragraph except for those in § 50.55a(b)(2)(xv)(F) which are optional. Licensees who use later editions and addenda than the 2001 Edition of the ASME Code shall use the 2001 Edition of Appendix VIII.

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xviii)(A)	<i>Certification of NDE personnel:</i> 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)	<i>Certification of NDE personnel:</i> 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)	<i>Certification of NDE personnel:</i> 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.
10 CFR 50.55a(b)(2)(xix)	<i>Substitution of alternative methods:</i> 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.

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(b)(2)(xx)(B)	<i>System leakage tests:</i> The NDE provision in IWA-4540(a)(2) of the 2002 Addenda of Section XI must be applied when performing system leakage tests after repair and replacement activities performed by welding or brazing on a pressure retaining boundary using the 2003 Addenda through the latest Edition and Addenda incorporated by reference in paragraph (b)(2) of this section.
10 CFR 50.55a(b)(2)(xxi)(A)	<i>Table IWB-2500-1 examination requirements:</i> 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, with a limiting assumption on the flaw aspect ratio (i.e., $a/l = 0.5$ ), may be performed in place of an ultrasonic examination.
10 CFR 50.55a(b)(2)(xxii)	<i>Surface Examination:</i> 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)	<i>Evaluation of Thermally Cut Surfaces:</i> 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.

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(2)(xxiv)	<i>Incorporation of the Performance Demonstration Initiative and Addition of Ultrasonic Examination Criteria:</i> 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)	<i>Mitigation of Defects by Modification:</i> 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)	<i>Pressure Testing Class 1, 2, and 3 Mechanical Joints:</i> 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.
10CFR 50.55a(b)(2)(xxvii)	<i>Removal of Insulation:</i> 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.

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(3)(v)	<p><i>Subsection ISTD:</i> Article IWF-5000, "Inservice Inspection Requirements for Snubbers," of the ASME BPV Code, Section XI, provides inservice inspection requirements for examinations and tests of snubbers at nuclear power plants. Licensees may use Subsection ISTD, "Inservice Testing of Dynamic Restraints (Snubbers) in Light-Water Reactor Power Plants," ASME O&amp;M Code, 1995 Edition through the latest Edition and Addenda incorporated by reference in Paragraph (b)(3) of this section, in place of the requirements for snubbers in Section XI, IWF-5200(a) and (b) and IWF-5300(a) and (b), by making appropriate changes to their technical specifications or licensee-controlled documents. Preservice and inservice examinations must be performed using the VT-3 visual examination method described in IWA-2213.</p>



**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(5)	<p><i>Inservice Inspection Code Cases:</i> Licensees may apply the ASME Boiler and Pressure Vessel Code Cases listed in Regulatory Guide 1.147 through Revision 15, without prior NRC approval subject to the following:</p> <p>(i) When a licensee initially applies a listed Code Case, the licensee shall apply the most recent version of that Code Case incorporated by reference in this Paragraph.</p> <p>(ii) If a licensee has previously applied a Code Case and a later version of the Code Case is incorporated by reference in this Paragraph, the licensee may continue to apply, to the end of the current 120-month interval, the previous version of the Code Case as authorized or may apply the later version of the Code Case, including any NRC-specified conditions placed on its use.</p> <p>(iii) Application of an annulled Code Case is prohibited unless a licensee previously applied the listed Code Case prior to it being listed as annulled in Regulatory Guide 1.147. Any Code Case listed as annulled in any Revision of Regulatory Guide 1.147 which a licensee has applied prior to it being listed as annulled, may continue to be applied by that licensee to the end of the 120-month interval in which the Code Case was implemented.</p>

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
10 CFR 50.55a(b)(6)	<p><i>Operation and Maintenance of Nuclear Power Plants Code Cases:</i> Licensees may apply the ASME Operation and Maintenance Nuclear Power Plants Code Cases listed in Regulatory Guide 1.192 without prior NRC approval subject to the following:</p> <p>(i) When a licensee initially applies a listed Code Case, the licensee shall apply the most recent version of that Code Case incorporated by reference in this Paragraph.</p> <p>(ii) If a licensee has previously applied a Code Case and a later version of the Code Case is incorporated by reference in this Paragraph, the licensee may continue to apply, to the end of the current 120-month interval, the previous version of the Code Case as authorized or may apply the later version of the Code Case, including any NRC-specified conditions placed on its use.</p> <p>(iii) Application of an annulled Code Case is prohibited unless a licensee previously applied the listed Code Case prior to it being listed as annulled in Regulatory Guide 1.192. If a licensee has applied a listed Code Case that is later listed as annulled in Regulatory Guide 1.192, the licensee may continue to apply the Code Case to the end of the current 120-month interval.</p>

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

10 CFR 50.55a Paragraphs	Limitations, Modifications, and Clarifications
10 CFR 50.55a(g)(6)(ii)(D)(1)	<p><i>Reactor vessel head inspections:</i> All licensees of pressurized water reactors shall augment their inservice inspection program with ASME Code Case N-729-1 subject to the conditions specified in paragraphs (g)(6)(ii)(D)(2) through (6) of this section. Licensees of existing operating reactors as of September 10, 2008 shall implement their augmented inservice inspection program by December 31, 2008. Once a licensee implements this requirement, the First Revised NRC Order EA-03-009 no longer applies to that licensee and shall be deemed to be withdrawn.</p> <p>Note 9 of ASME Code Case N-729-1 shall not be implemented.</p> <p>Instead of the specified 'examination method' requirements for volumetric and surface examinations in Note 6 of Table 1 of Code Case N-729-1, the licensee shall perform volumetric and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Figure 2 of ASME Code Case N-729-1. A demonstrated volumetric or surface leak path assessment through all J-groove welds shall be performed. If a surface examination is being substituted for a volumetric examination on a portion of a penetration nozzle that is below the toe of the J-groove weld [Point E on Figure 2 of ASME Code Case N-729-1], the surface examination shall be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically. See ISI Program Note 31 (Section 7 of ISI Plan) for additional requirements associated with examination procedures and personnel qualifications.</p>

**TABLE 1.8-1  
CODE OF FEDERAL REGULATIONS 10 CFR 50.55a REQUIREMENTS**

<b>10 CFR 50.55a Paragraphs</b>	<b>Limitations, Modifications, and Clarifications</b>
50.55a(g)(6)(ii)(E)(1)	<i>Reactor coolant pressure boundary visual inspections: All licensees of pressurized water reactors shall augment their inservice inspection program by implementing ASME Code Case N-722 subject to the conditions specified in paragraphs (g)(6)(ii)(E)(2) through (4) of this section. The inspection requirements of ASME Code Case N-722 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement. See ISI Program Note 32 (Section 7 of ISI Plan) for additional requirements associated with indication disposition</i>

## 1.9 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 Braidwood Station, are included in Sections 2.1.1 and 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 15. As this guide is revised, newly approved Code Cases are evaluated for plan implementation at Braidwood 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 Braidwood Station through a relief request, are included in Section 8.0.

This ISI Program Plan will also utilize Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME O&M Code". The approved Code Cases in Regulatory Guide 1.192, which are being utilized by Braidwood Station, are 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 Braidwood Station.

## 1.10 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". Relief Requests for the Third ISI Interval and the Second CISI 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), 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**

As required by 10 CFR 50.55a, the ISI and CISI Programs were 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, Inspection Program B of IWA-2432, approved ASME Code Cases, and approved alternatives through relief requests and Safety Evaluation Reports (SER's).

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)(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 ensure 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 ISI interval, Braidwood Station's inspection program for ASME Section XI Examination 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-01) is also being used for the classification of piping structural elements under the RISI program. The RISI program scope has been implemented as an alternative to the 2001 Edition through the 2003 Addenda, 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). The basis for the resulting Risk Categorizations of the nonexempt Class 1 and 2 piping systems at Braidwood 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 ISI interval, the RISI program scope will continue 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 has been used to define the inspection scope in lieu of the 100% volumetric examination of all piping welds in the previous BER augmented inspection program. Therefore, all welds in the original augmented inspection program for BER remain evaluated under the RISI Program using an integrated risk-informed approach.

The CISI Program per IWE and IWL is included in Section 6.0, "Containment ISI Plan". The CISI relief requests are included in Section 8.0 of this document.

#### 2.1.1 ASME Section XI Code Cases

Regulatory Guide 1.147, Revision 15, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1 identifies the Code Cases that have been determined by the NRC to be acceptable alternatives to applicable parts of ASME Section XI. These Code Cases may be used by Braidwood Station without a request for authorization from the NRC, provided that they are used with any identified limitations or modifications.

- |         |  |
|---------|--|
| 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-508-3 | Rotation of Serviced Snubbers and Pressure Relief Valves for the Purpose of Testing, Section XI, Division 1  |
| N-513-2 | Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or Class 3 Piping, Section XI, Division 1   |
| N-517-1 | Quality Assurance Program Requirements for Owners, Section XI, Division 1  |
| N-526   | Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels, Section XI, Division 1   |
| N-532-4 | 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 |
| N-545   | Alternative Requirements of Conduct of Performance Demonstration Detection Test of Reactor Vessel, Section XI, Division 1  |
| N-566-2 | Corrective Actions for Leakage at Bolted Connections, Section XI, Division 1   |



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- N-586-1      Alternative Additional Examination Requirements for Classes 1, 2, and 3 Piping, Components, and Supports, Section XI, Division 1
- 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 Numbers 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-629      Use of Fracture Toughness Test Data to Establish Reference Temperature for Pressure Retaining Materials, Section XI, Division 1
- N-641      Alternative Pressure-Temperature Relationship and Low Temperature Overpressure Protection System Requirements, Section XI, Division 1
- N-643-2      Fatigue Crack Growth Rate Curves for Ferritic Steels in PWR Water Environment, Section XI, Division 1
- 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-652-1      Alternative Requirements to Categorize B-G-1, B-G-2, and C-D Bolting Examination Methods and Selection Criteria, Section XI, Division 1
- N-665      Alternative Requirements for Beam Angle Measurements Using Refracted Longitudinal Wave Search Units, Section XI, Division 1
- N-695      Qualification Requirements for Dissimilar Metal Piping Welds, Section XI, Division 1
- N-696      Qualification Requirements for Appendix VIII Piping Examinations Conducted from the Inside Surface, Section XI, Division 1

N-700      Alternative Rules for Selection of Classes 1, 2, and 3 Vessel Welded Attachments for Examination, Section XI, Division 1

N-706      Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchangers, Section XI, Division 1

#### 2.1.2 ASME Section XI Code Cases Conditionally Approved

The Code Cases listed below are acceptable to the NRC for application at Braidwood Station within the limitations imposed by the NRC staff. Unless otherwise stated, limitations imposed by the NRC are in addition to the conditions specified in the Code Case.

N-504-3      Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1

The provisions of ASME Section XI, Nonmandatory Appendix Q, "Weld Overlay Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping Weldments," must also be met.

N-516-3      Underwater Welding, Section XI, Division 1

Licensees must obtain NRC approval in accordance with 10 CFR 50.55a(a)(3) regarding the technique to be used in the weld repair or replacement of irradiated material underwater.

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

The requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance", 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-552      Alternative Methods – Qualification for Nozzle Inside Radius Section from the Outside Surface, Section XI, Division 1

To achieve consistency with the 10 CFR 50.55a rule change published September 22, 1999 (64 FR 51370), incorporating Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," to ASME Section XI, add the following to the specimen requirements:

“At least 50 percent of the flaws in the demonstration test set must be cracks and the maximum misorientation must be demonstrated with cracks. Flaws in nozzles with bore diameters equal to or less than 4 inches may be notches.”

Add to detection criteria, “The number of false calls must not exceed three.”

N-569-1      Alternative Rules for Repair by Electrochemical  
Deposition of Class 1 and 2 Steam Generator Tubing,  
Section XI, Division 1

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 the inspection and plugging criteria necessary for staff approval of the repair method. In addition, if the user plans to reconcile,” as described in Footnote 2, the reconciliation is to be performed in accordance with IWA-4200 in the 1995 Edition, 1996 Addenda of ASME Section XI.

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

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 the inspection and plugging criteria necessary for staff approval of the repair method. In addition, if the user plans to “reconcile,” as described in Footnote 2, the reconciliation is to be performed in accordance with IWA-4200 in the 1995 Edition, 1996 Addenda of ASME Section XI.

N-597-2      Requirements for Analytical Evaluation of Pipe Wall  
Thinning, Section XI, Division 1

(1) Code Case must be supplemented by the provisions of EPRI Nuclear Safety Analysis Center Report 202L-R2, “Recommendations for an Effective Flow Accelerated Corrosion Program,” April 1999, 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 term “should” is to be applied as “shall” (i.e., a requirement).

(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, "Rules for Construction of Nuclear Plant Components," 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 per 10 CFR 50.55a(a)(3).

(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 per 10 CFR 50.55a(a)(3).

(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 per 10 CFR 50.55a(a)(3). Inspection plans and wall thinning rates may be difficult to justify for certain degradation mechanisms such as MIC and pitting.

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

UT 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

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-648-1      Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles, Section XI, Division 1

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 external surfaces shown in the figures applicable to this table (the external surface is from point M to point N in the figure).

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

- (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-694-1        Evaluation Procedure and Acceptance Criteria for  
                         PWR Reactor Vessel Upper Head Penetration,  
                         Section XI, Division 1.

- (a) The maximum instantaneous through-thickness stress distribution along the crack-length path must be used to calculate the crack driving force.
- (b) The stress intensity factor expression of Raju and Newman is only applicable to cylindrical products having a ratio of wall thickness to inside radius between 0.1 and 0.25.

### 2.1.3 O&M Code Cases

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

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

## 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 Braidwood

Station that are not specifically addressed by ASME Section XI, or the examinations that will be performed in addition to the requirements of ASME Section XI 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 Braidwood 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 as modified by the requirements of Braidwood Station License Amendment #118 and Technical Requirements Manual Appendix G.

The commitment to Regulatory Guide 1.14 has been modified by Braidwood Station License Amendment #118. In lieu of Regulatory Position c.4.b.(1) and c.4.b.(2), a qualified in-place UT examination over the volume from the inner bore of the flywheel to the circle of one-half the outer radius or a surface examination (MT and/or PT) of exposed surfaces of the removed flywheel may be conducted at approximately 10 year intervals coinciding with the Inservice Inspection schedule as required by ASME Section XI.

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

This details Braidwood Station's commitment to examine welds susceptible to thermal stratification.

To address NRC Bulletin 88-08, Braidwood Station had committed to inspecting critical locations on the suction lines to the Residual Heat Removal (RHR) pumps from RCS loops 1 and 3, and the Auxiliary and Main Pressurizer Spray lines every other refueling outage.

With the implementation of the RISI Program, the NRC Bulletin 88-08 augmented inspection commitment will no longer be required at Braidwood Station. The RISI Program completely subsumed 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 have been 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 NRC Bulletin 88-08.

- 2.2.4 Augmented volumetric examinations of Class 2 ECC, RHR, and CHR (Containment Spray, Chemical and Volume Control, Residual Heat Removal, and Safety Injection) system piping.

Braidwood Station has committed to volumetrically examine 7.5% of the circumferential piping welds, greater than 4 inch nominal pipe size, within systems which contain stagnant boroated water and are not subject to volumetric examination per ASME Section XI.

Note: Commitment to be maintained after the implementation of Risk-Informed ISI as this evaluation did not address the Class 2 components with wall thickness < 0.375".

- 2.2.5 Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds". All licensees of pressurized water reactors are required to augment their inservice inspection program with ASME Code Case N-729-1 subject to the conditions specified in paragraphs 10 CFR 50.55a(g)(6)(ii)(D)(2) through (6). This requirement replaces previous inspections that were mandated under NRC First Revised Order EA-03-009, "ISSUANCE OF FIRST REVISED NRC ORDER (EA-03-009) ESTABLISHING INTERIM INSPECTION REQUIREMENTS FOR REACTOR PRESSURE VESSEL HEADS AT PRESSURIZED WATER REACTORS" dated February 20, 2004.
- 2.2.6 MRP-139 "Primary System Piping Butt Weld Inspection and Evaluation Guideline" provides a strategy to manage degradation of butt welds in primary system piping that are 1" NPS or greater

and are exposed to temperatures greater than or equal to cold leg temperature.

Braidwood Station has committed to comply with the criteria of MRP-139 for welds that are potentially susceptible to Primary Water Stress Corrosion Cracking (PWSCC). This commitment affects 28 welds (14 welds per unit) where dissimilar metal welds are used to join piping nozzles on the RPV or Pressurizer. The MRP-139 requirements are independent from the RISI Program, and these examinations will be performed in addition to the RISI Program examinations, unless dual crediting can occur for single examinations that meet the individual requirements of both the RISI Program and MRP-139.

2.2.7 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 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 Braidwood Station program addressing these requirements is included in BwVS 290-1, BwVS 290-2-GW, and BwVS 290-2-OG.

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

The NRC 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. Braidwood's response to GL 88-05 requirements are incorporated through the completion of normal station operator walkdowns, heightened Maintenance and Tech Staff (now Plant 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 visual 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.

2.2.9 Code Case N-722, "Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials". All licensees of pressurized water reactors shall augment their inservice inspection program by implementing ASME Code Case N-722 subject to the conditions specified in paragraphs 10 CFR 50.55a(g)(6)(ii)(E)(2) through (4). The inspection requirements of ASME Code Case N-722 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement.

### 2.3 System Classification 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 and post-tensioning system is CISI 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 Braidwood 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, 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 10 CFR 50.2, 10 CFR 50.55a(c)(1), 10 CFR 50.55a(c)(2), Regulatory Guide 1.26, and ANSI N18.2-1973. Although Braidwood 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 10 CFR 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. In addition to the line coding system shown on ISI-CBD-LEGEND, codings used to develop Braidwood Station Units 1 and 2 System Pressure Testing Program are shown on drawing SPT-TBD-LEGEND, Sheet 1.

The systems and components (piping, pumps, valves, vessels, etc.), which are subject to the examinations of Articles IWB-2000, IWC-2000, IWD-2000, IWF-2000, and pressure tests of IWB-5000, IWC-5000, and IWD-5000 are identified on the ISI CBD's as detailed in Tables 2.3-1 and 2.3-2. Containment components subject to examination of Articles IWE-2000 and IWL-2000 are identified on the CISI Component Drawings shown in Tables 2.4-3 and 2.4-4.

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

UNIT 1 & COMMON	UNIT 2	SYSTEM
M-35-1, 2	M-120-1, 2A, 2B	Main Steam
M-36-1A, 1B, 1C, 1D	M-121-1A, 1B, 1C, 1D	Main Feedwater
M-37	M-122	Auxiliary Feedwater
M-42-1A, 1B, 2A, 2B, 3, 4, 5A, 5B, 6	M-42-1A, 1B, 2A, 2B, M-126-1, 2, 3	Essential Service Water
M-46-1A, 1B, 1C	M-129-1A, 1B, 1C	Containment Spray
M-47-2	M-150-2	Off Gas
M-48-5A	M-48-5B	Waste Disposal Steam Generator Blowdown
M-48-57	---	Waste Disposal Resin Removal
M-48-6A, 6B	M-48-6A, 6B	Waste Disposal Aux Bldg Floor Drains
M-49-1A	M-49-1B	Make-Up Demineralizer
M-50-1A, 1B, 1C, 1D, 3	M-130-1A, 1B, 2	Diesel Fuel Oil
M-51-6	---	Chemical Feed
M-52-1	---	Fire Protection
M-54-2	M-54-2	Service Air
M-54-4A	M-54-4B	Diesel Generator Starting Air
M-55-10	M-55-15	Instrument Air (Containment Building)
M-55-11	---	Instrument Air
---	M-55-14	Instrument Air (Auxiliary Building)
M-59-1A, 1B	M-149	Nitrogen System
M-60-1A, 1B, 2, 3, 4, 5, 6, 8	M-135-1A, 1B, 2, 3, 4, 5, 6, 8	Reactor Coolant
M-61-1A, 1B, 2, 3, 4, 5, 6	M-136-1, 2, 3, 4, 5, 6	Safety Injection
M-62	M-137	Residual Heat Removal
M-63-1A, 1B, 1C	M-63-1A, 1B, 1C	Fuel Pool Cooling and Cleanup
M-64-1, 2, 3A, 3B, 4A, 4B, 5, 6, 7	M-138-1, 2, 3A, 3B, 4A, 4B, 5A, 5B, 5C, 6, 7	Chemical and Volume Control
M-65-1B, 5A, 5B	M-65-1B, 5A, 5B	Boric Acid Processing
M-65-2A	---	Boric Acid Processing

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

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

UNIT 1 & COMMON	UNIT 2	SYSTEM
M-65-3	M-65-6	Boric Acid Processing
M-66-1A, 1B, 2, 3A, 3B, 4A, 4C, 4D	M-66-3A, 3B, 4B, 4C, 4D, M-139-1, 2	Component Cooling
M-68-1A, 1B, 6	M-140-1A, 1B, 5	Process Sampling
M-68-7	M-140-6	Post Accident H <sub>2</sub> Monitoring
M-68-8	---	Process Sampling Steam Generator Blowdown
M-69-1, 2, 3	---	Radioactive Waste Gas
M-70-1	M-141-1	Reactor Bldg Equipment Drains & Vents
M-70-2	M-141-2	Containment Bldg Equipment Drains
M-78-6,10	M-78-6, M-151-1	Process Radiation Monitoring
M-82-1, 2, 3, 5, 15	M-82-1, 2, 3, 5, 6	Auxiliary Building Equipment Drains
M-105-1	M-106-1	Containment Purge
M-105-3	M-105-3	Integrated Leak Rate Test
M-118-1,5,14	M-118-7	Control Room Chilled Water
M-152-9	M-152-9	Diesel Generator Lube Oil
M-152-14	M-152-14	Diesel Generator Jacket Water
M-152-19	M-152-19	Diesel Generator Cooling Water
M-2069-5	---	Waste Gas
M-2060-6, 7, 8, 17, 18	M-2135-6, 7, 8, 17, 18	Reactor Coolant System

2.4 ISI Isometric and Component Drawings for Nonexempt ISI Class Component Supports

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

Braidwood Station's ISI Program, including the ISI Database, ISI Classification Basis Document, and ISI Selection Document, addresses the nonexempt components, which require examination and testing.

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

**TABLE 2.4-1  
UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>AUXILIARY FEEDWATER SYSTEM (AF)</b>	
1AF-01	Auxiliary Feedwater Lines 1AF02DB-4", 1AF02DF-4", and 1AF02EB-4"
1AF-02	Auxiliary Feedwater Lines 1AF02DC-4", 1AF02DG-4", and 1AF02EC-4"
1AF-03	Auxiliary Feedwater Lines 1AF02DA-4", 1AF02DE-4", and 1AF02EA-4"
1AF-04	Auxiliary Feedwater Lines 1AF02DD-4", 1AF02DH-4", and 1AF02ED-4"
1AF-05	Auxiliary Feedwater Lines 1FW06AB-4" and 1FW87BB-3"
1AF-06	Auxiliary Feedwater Lines 1FW06AC-4" and 1FW87BC-3"
1AF-07	Auxiliary Feedwater Lines 1FW06AA-4" and 1FW87BA-3"
1AF-08	Auxiliary Feedwater Lines 1FW06AD-4" and 1FW87BD-3"
<b>CONTAINMENT SPRAY SYSTEM (CS)</b>	
1CS-01	Containment Spray Line 1CS02AA-10"
1CS-02	Containment Spray Line 1CS10AA-6"
1CS-03	Containment Spray Lines 1CS01AA-16", 1CS23AA-14", and 1CS06AA-6"
1CS-04	Containment Spray Lines 1CS01AB-16", 1CS23AB-14", and 1CS06AB-6"
1CS-05	Containment Spray Line 1CS02AB-10"
1CS-06	Containment Spray Lines 1CS02AB-10" and 1CS10AB-6"
1CS-07	Containment Spray Line 1CS02AA-10"
1CSP-01	Containment Spray Pumps 1CS01PA-1" and 1CS01PB-2"
<b>CHEMICAL &amp; VOLUME CONTROL SYSTEM (CV)</b>	
1CV-01	Chemical & Volume Control Line 1CVB7A-3"
1CV-02	Chemical & Volume Control Lines 1RY18A-2" and 1CV45B-2"
1CV-03	Chemical & Volume Control Lines 1CV14FB-2" and 1CV14GB-1 1/2"
1CV-04	Chemical & Volume Control Lines 1CVA5AB-2" and 1CVA6AB-2"
1CV-05	Chemical & Volume Control Line 1CVA3B-2"
1CV-06	Chemical & Volume Control Lines 1CV14FA-2", 1CV14FD-2", 1CV14GD-1 1/2", and 1CV14GA-1 1/2"
1CV-07	Chemical & Volume Control Line 1CVA3B-2"
1CV-08	Chemical & Volume Control Line 1CVA5AA-2"

**TABLE 2.4-1**  
**UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>CHEMICAL &amp; VOLUME CONTROL SYSTEM (CV) [Continued]</b>	
1CV-09	Chemical & Volume Control Lines 1CVA3B-2" and 1CVA3AB-2"
1CV-10	Chemical & Volume Control Line 1CVA7AB-2"
1CV-11	Chemical & Volume Control Lines 1CVA3B-2" and 1CVA6AA-2"
1CV-12	Chemical & Volume Control Line 1CV45B-2"
1CV-13	Chemical & Volume Control Line 1CVA3B-2"
1CV-14	Chemical & Volume Control Line 1CVA3B-2"
1CV-15	Chemical & Volume Control Line 1CVA3B-2"
1CV-16	Chemical & Volume Control Lines 1CV14FC-2" and 1CV14GC-1 1/2"
1CV-17	Chemical & Volume Control Line 1CV05CB-6"
1CV-18	Chemical & Volume Control Line 1CV05B-8"
1CV-19	Chemical & Volume Control Lines 1CV05B-8", 1CV99A-8", and 1CVA1A-6"
1CV-20	Chemical & Volume Control Lines 1CV05B-8", 1CV05CA-6", 1CV98A-8", 1CV98BA-8", 1CV98BB-8", and 1CV98C-8"
1CV-21	Chemical & Volume Control Lines 1CVJ4A-4", 1CV09A-4", 1CV08AA-4", 1CV12AA-3", and 1CV42AA-2"
1CV-22	Chemical & Volume Control Lines 1CV08BA-4", 1CV12AB-3", and 1CV42AB-2"
<b>MAIN FEEDWATER SYSTEM (FW)</b>	
1FW-01	Feedwater Lines 1FW03CD-16", 1FW03DD-16", and 1FW86AD-16"
1FW-02	Feedwater Lines 1FW03CA-16", 1FW03DA-16", and 1FW86AA-16"
1FW-03	Feedwater Lines 1FW03CB-16", 1FW86AB-16", and 1FW03DB-16"
1FW-04	Feedwater Lines 1FW03CC-16", 1FW03DC-16", and 1FW86AC-16"
1FW-05	Feedwater Lines 1FW81AB-6", 1FW81BB-6", and 1FW87CB-6"
1FW-06	Feedwater Line 1FW87CB-6"
1FW-07	Feedwater Line 1FW87CC-6"
1FW-08	Feedwater Line 1FW87CD-6"
1FW-09	Feedwater Line 1FW87CA-6"
1FW-10	Feedwater Lines 1FW81AC-6", 1FW81BC-6", and 1FW87CC-6"
1FW-11	Feedwater Lines 1FW81AA-6", 1FW81BA-6", and 1FW87CA-6"

**TABLE 2.4-1**  
**UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>MAIN FEEDWATER SYSTEM (FW) [Continued]</b>	
1FW-12	Feedwater Lines 1FW81AD-6", 1FW81BD-6", and 1FW87CD-6"
<b>MAIN STEAM SYSTEM (MS)</b>	
1MS-01	Main Steam Line 1MS01AD-30 1/4"
1MS-02	Main Steam Lines 1MS01BD-30 1/4", 1MS01CD-30 1/4", 1MS07AD-28", 1MS08AD-6", 1MS09AD-6", 1MS10AD-6", 1MS11AD-6", 1MS12AD-6", 1MS13AD-8", and 1MS143AD-12"
1MS-03	Main Steam Line 1MS01AA-30 1/4"
1MS-04	Main Steam Lines 1MS01BA-30 1/4", 1MS01CA-30 1/4", 1MS07AA-28", 1MS08AA-6", 1MS09AA-6", 1MS10AA-6", 1MS11AA-6", 1MS12AA-6", 1MS13AA-8", and 1MS143AA-12"
1MS-05	Main Steam Line 1MS01AB-32 3/4"
1MS-06	Main Steam Lines 1MS01BB-32 3/4", 1MS01CB-32 3/4", 1MS07AB-28", 1MS08AB-6", 1MS09AB-6", 1MS10AB-6", 1MS11AB-6", 1MS12AB-6", 1MS13AB-8", and 1MS143AB-12"
1MS-07	Main Steam Line 1MS01AC-32 3/4"
1MS-08	Main Steam Lines 1MS01BC-32 3/4", 1MS01CC-32 3/4", 1MS07AC-28", 1MS08AC-6", 1MS09AC-6", 1MS10AC-6", 1MS11AC-6", 1MS12AC-6", 1MS13AC-8", and 1MS143AC-12"
<b>REACTOR COOLANT SYSTEM (RC &amp; RY)</b>	
1PZR-01	Pressurizer No. 1RY01S
1RC-01	Primary Coolant System Loop 1 To Steam Gen. No. 1RC01BA
1RC-02	Primary Coolant System Loop 2 To Steam Gen. No. 1RC01BB
1RC-03	Primary Coolant System Loop 3 To Steam Gen. No. 1RC01BC
1RC-04	Primary Coolant System Loop 4 To Steam Gen. No. 1RC01BD
1RC-05	Reactor Coolant Surge Line 1RY11A-14"
1RC-06	Reactor Coolant Lines 1RC21AA-8" and 1RC21BA-8"
1RC-07	Reactor Coolant Lines 1RC28A-3", 1CV10DA-3", 1RC37A-3", 1CV10DB-3", and 1RC36A-3"
1RC-08	Reactor Coolant Lines 1RC09FA-3" and 1RC09EA-3"
1RC-09	Reactor Coolant Lines 1RC21AB-8" and 1RC21BB-8"
1RC-10	Reactor Coolant Line 1RC09FB-3"



**TABLE 2.4-1**  
**UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>REACTOR COOLANT SYSTEM (RC &amp; RY) [Continued]</b>	
1RC-11	Reactor Coolant Lines 1RC04AB-12" and 1RC05AB-6"; Residual Heat Removal Line 1RH01AB-12"
1RC-12	Reactor Coolant Lines 1RC21AC-8" and 1RC21BC-8"
1RC-13	Reactor Coolant Lines 1RC09EC-3" and 1RC09FC-3"
1RC-14	Reactor Coolant Lines 1RC24AB-4" and 1RY01AB-4"
1RC-15	Reactor Coolant Lines 1RC21AD-8" and 1RC21BD-8"
1RC-16	Reactor Coolant Lines 1RY01B-6" and 1RY01C-4"
1RC-17	Reactor Coolant Lines 1RC24AA-4" 1RY01AA-4", 1RY01AB-4", and 1RY01B-6"
1RC-18	Reactor Coolant Lines 1RC09FD-3" and 1RC09ED-3"
1RC-19	Reactor Coolant Line 1RC22AB-1 1/2"
1RC-20	Reactor Coolant Line 1RC22AD-1 1/2"
1RC-21	Reactor Coolant Line 1RC22AB-1 1/2"
1RC-22	Reactor Coolant Lines 1RC05AA-6" (Loop 2) and 1RC35AB-6" (Loop 4)
1RC-23	Reactor Coolant Line 1RC22AA-1 1/2"
1RC-24	Reactor Coolant Line 1RC22AC-1 1/2"
1RC-27	Reactor Coolant Lines 1RC22AA-1 1/2" and 1RC22AC-1 1/2"
1RC-29	Reactor Coolant Lines 1RC16AC-2" (Loop 3) and 1RC16AD-2" (Loop 4)
1RC-30	Reactor Coolant Lines 1RC13AA-2", 1RC13AB-2", 1RC13AC-2", and 1RC13AD-2"
1RC-31	Reactor Coolant Lines 1RC14AB-2" (Loop 2) and 1RC26A-2" (Loop 4)
1RC-32	Reactor Coolant Lines 1RY03AA-6", 1RY03AB-6", 1RY03AC-6", 1RY03BA-6", 1RY03BB-6", and 1RY03BC-6"
1RC-35	Reactor Coolant Lines 1RY02A-6", 1RY06A-3", and 1RY02B-3"
1RC-36	Reactor Coolant Lines 1RC14AA-2" and 1CVA3AA-2"
1RC-37	Reactor Coolant Lines 1RC14AD-2" and 1CVA7AA-2"
1RC-41	Reactor Coolant Lines 1RC16AA-2" (Loop 1) and 1RC16AB-2" (Loop 2)
1RC-42	Reactor Coolant Line 1RC14AC-2"
1RCP-01	Reactor Coolant Pumps 1RC01PA, 1RC01PB, 1RC01PC, and 1RC01PD
1RV-01	Reactor Pressure Vessel Hot Leg / Cold Leg Nozzles

**TABLE 2.4-1  
UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>REACTOR COOLANT SYSTEM (RC &amp; RY) [Continued]</b>	
1RV-02	Reactor Pressure Vessel Bottom Closure Head
1RV-03	Reactor Pressure Vessel Top Closure Head
1SG-05	Steam Generator No. 1RC01BA
1SG-06	Steam Generator No. 1RC01BB
1SG-07	Steam Generator No. 1RC01BC
1SG-08	Steam Generator No. 1RC01BD
<b>RESIDUAL HEAT REMOVAL SYSTEM (RH)</b>	
1RH-01	Residual Heat Removal Line 1RH01AB-12"
1RH-02	Residual Heat Removal Line 1RH01AA-12"
1RH-03	Residual Heat Removal Lines 1RH03AA-8" and 1RH12A-8"
1RH-04	Residual Heat Removal Lines 1RH01BA-12" and 1RH01CA-16", and 1SI82BA-12"
1RH-05	Residual Heat Removal Lines 1RH02AA-8" and 1RH09AA-8"
1RH-06	Residual Heat Removal Lines 1RH02AB-8", 1RH03AB-8", and 1RH09AB-8"
1RH-07	Residual Heat Removal Lines 1RH03AB-8", 1RH14A-8", and 1RH03AA-8"
1RH-08	Residual Heat Removal Lines 1RH01BB-12" and 1RH01CB-16", and 1SI82BB-12"
1RH-09	Residual Heat Removal Line 1RH02AB-8"
1RHP-01	Residual Heat Removal Pumps 1RH01PA-1-1A and 1RH01PB-2-1B; Charging Pumps 1CV02P, 1CV01PA, and 1CV01PB
1RHX-01	Residual Heat Exchanger Nos. 1RH02AA and 1RH02AB
<b>STEAM GENERATOR BLOWDOWN (SD)</b>	
1SD-01	SD Inservice Inspection Isometric Inside Cont. Bldg. – Loop 1
1SD-02	SD Inservice Inspection Isometric Inside Cont. Bldg. – Loop 2
1SD-03	SD Inservice Inspection Isometric Inside Cont. Bldg. – Loop 3
1SD-04	SD Inservice Inspection Isometric Inside Cont. Bldg. – Loop 4
<b>SAFETY INJECTION SYSTEM (SI)</b>	
1SI-01	Safety Injection Lines 1RC29AA-10" and 1SI09BA-10"

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 2.4-1**  
**UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>SAFETY INJECTION SYSTEM (SI) [Continued]</b>	
1SI-02	Safety Injection Lines 1SIA4B-8" and 1SI03FA-2", 1RC04AA-12", and 1RC35AA-6"
1SI-03	Safety Injection Line 1SI05DA-6"
1SI-04	Safety Injection Lines 1SI05BA-8", 1SI05CA-8", and 1SI05CD-8"
1SI-05	Safety Injection Lines 1RC29AB-10" and 1SI09BB-10"
1SI-06	Safety Injection Lines 1SI05DB-6" and 1SI18FB-2"
1SI-07	Safety Injection Lines 1SI08FA-3", 1SI08FB-3", and 1SI08E-3"
1SI-08	Safety Injection Line 1SI08FA-3"
1SI-09	Safety Injection Lines 1RC29AC-10" and 1SI09BC-10"
1SI-10	Safety Injection Lines 1SI05DC-6" and 1SI18FC-2"
1SI-11	Safety Injection Lines 1SI04D-8" and 1SI03DB-2"
1SI-12	Safety Injection Lines 1SI04A-12", 1SI04B-12", 1SI04C-8", and 1SIA4A-8"
1SI-13	Safety Injection Lines 1RC29AD-10", 1SI09BD-10", and 1SI05DD-6"
1SI-14	Safety Injection Line 1SI05DD-6"
1SI-15	Safety Injection Lines 1SI08JC-1 1/2" and 1RC30AC-1 1/2"
1SI-16	Safety Injection Lines 1SI08JD-1 1/2" and 1RC30AD-1 1/2"
1SI-17	Safety Injection Lines 1SI08JB-1 1/2" and 1RC30AB-1 1/2"
1SI-18	Safety Injection Lines 1SI08HB-2", 1SI08GB-1 1/2", and 1SI08JB-1 1/2"
1SI-19	Safety Injection Lines 1SI08GA-1 1/2", 1SI08HA-2", and 1SI08JA-1 1/2"
1SI-20	Safety Injection Lines 1SI08GC-1 1/2", 1SI08HC-2", 1SI08JC-1 1/2", 1SI08GD-1 1/2", 1SI08HD-2", and 1SI08JD-1 1/2"
1SI-21	Safety Injection Line 1SI03DA-2"
1SI-22	Safety Injection Line 1SI03FB-2"
1SI-23	Safety Injection Lines 1SI18FA-2" and 1SI18FD-2"; Reactor Coolant Line 1RY76A-2"
1SI-24	Safety Injection Lines 1SI06BA-24" and 1SI06BB-24"
1SI-25	Safety Injection Line 1SI05AA-8"
1SI-26	Safety Injection Lines 1SI05BB-8", 1SI05CB-8", and 1SI05CC-8"
1SI-27	Safety Injection Line 1SI08JD-1 1/2"
1SI-28	Safety Injection Lines 1SI09AB-10" and 1SI09AC-10"

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 2.4-1**  
**UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>SAFETY INJECTION SYSTEM (SI) [Continued]</b>	
1SI-29	Safety Injection Line 1SI08JC-1 1/2"
1SI-30	Safety Injection Lines 1SI09AA-10" and 1SI09AD-10"
1SI-31	Safety Injection Lines 1SI08JA-1 1/2" and 1RC30AA-1 1/2"
1SI-32	Safety Injection Line 1SI05AB-8"
1SI-33	Safety Injection Line 1SI34A-8"
1SI-34	Safety Injection Lines 1SI02A-8", 1SI01B-24", and 1SIH8E-24"
1SI-35	Safety Injection Lines 1SI82AA-12", 1SI01A-8", 1SI53AA-14", and 1SI01B-24"
1SI-36	Safety Injection Lines 1SI02A-8", 1SI02BB-6", 1SIF9A-8", and 1SI02BA-6"
1SI-37	Safety Injection Lines 1SI02BA-6", 1SI13A-6", 1SI13BA-6", 1SI13BB-6", and 1SI13C-6"
1SI-38	Safety Injection Lines 1SI01B-24", 1SI53AB-14", and 1SI82AB-12"
1SI-39	Safety Injection Lines 1SI08B-4", 1SI08CA-4", 1SI08CB-4", and 1SI08D-3"
<b>ESSENTIAL SERVICE WATER SYSTEM (SX)</b>	
1SX-01	Essential Service Water Lines 1SX06EA-10", 1SX06CA-14", and 1SX06BA-16"
1SX-02	Essential Service Water Lines 1SX06EC-10", 1SX06DC-10", 1SX08AC-10", and 1SX08BC-10"
1SX-03	Essential Service Water Lines 1SX06EA-10", 1SX06FA-10", 1SX08AA-10", and 1SX08BA-10"
1SX-04	Essential Service Water Lines 1SX06EB-10", 1SX06CB-14", and 1SX06BB-16"
1SX-05	Essential Service Water Lines 1SX06ED-10", 1SX06DD-10", 1SX08AD-10", and 1SX08BD-10"
1SX-06	Essential Service Water Lines 1SX06EB-10", 1SX06FB-10", 1SX08AB-10", and 1SX08BB-10"
1SX-07	Essential Service Water Lines 1SX07CB-10", 1SX07EB-14", and 1SX07FB-16"
1SX-08	Essential Service Water Lines 1SX07BB-10", 1SX07CB-10", 1SX09BB-10", and 1SX09CB-10"
1SX-09	Essential Service Water Lines 1SX07CD-10", 1SX07BD-10", 1SX09CD-10" and 1SX09BD-10"

**TABLE 2.4-1  
UNIT 1 & COMMON ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>ESSENTIAL SERVICE WATER SYSTEM (SX) [Continued]</b>	
1SX-10	Essential Service Water Lines 1SX07CA-10", 1SX07EA-14", and 1SX07FA-16"
1SX-11	Essential Service Water Lines 1SX07CA-10", 1SX07BA-10", 1SX09BA-10", and 1SX09CA-10"
1SX-12	Essential Service Water Lines 1SX07BC-10", 1SX07CC-10", 1SX09BC-10", and 1SX09CC-10"
<b>PRIMARY CONTAINMENT PURGE (VQ)</b>	
1A-VQ-08	Primary Containment Purge Lines 1VQ03A-8" and 1VQ05A-8"
1A-VQ-12	Primary Containment Purge Line 1VQ04A-8"
1C-VQ-101	Primary Containment Purge Lines 1VQ01A-48" and 1VQ02A-48"

**TABLE 2.4-2**  
**UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>AUXILIARY FEEDWATER SYSTEM (AF)</b>	
2AF-01	Auxiliary Feedwater Lines 2AF02DB-4", 2AF02DF-4", and 2AF02EB-4"
2AF-02	Auxiliary Feedwater Lines 2AF02DC-4", 2AF02DG-4", and 2AF02EC-4"
2AF-03	Auxiliary Feedwater Lines 2AF02DA-4", 2AF02DE-4", and 2AF02EA-4"
2AF-04	Auxiliary Feedwater Lines 2AF02DD-4", 2AF02DH-4", and 2AF02ED-4"
2AF-05	Auxiliary Feedwater Lines 2FW06AB-4" and 2FW87BB-3"
2AF-06	Auxiliary Feedwater Lines 2FW06AA-4" and 2FW87BA-3"
2AF-07	Auxiliary Feedwater Lines 2FW06AD-4" and 2FW87BD-3"
2AF-08	Auxiliary Feedwater Lines 2FW06AC-4" and 2FW87BC-3"
<b>CONTAINMENT SPRAY SYSTEM (CS)</b>	
2CS-01	Containment Spray Line 2CS02AA-10"
2CS-02	Containment Spray Line 2CS10AA-6"
2CS-03	Containment Spray Lines 2CS01AA-16", 2CS23AA-14", and 2CS06AA-6"
2CS-04	Containment Spray Lines 2CS01AB-16", 2CS23AB-14", and 2CS06AB-6"
2CS-05	Containment Spray Line 2CS02AB-10"
2CS-06	Containment Spray Lines 2CS02AB-10" and 2CS10AB-6"
2CS-07	Containment Spray Line 2CS02AA-10"
2CSP-01	Containment Spray Pumps 2CS01PA-1" and 2CS01PB-2"
<b>CHEMICAL &amp; VOLUME CONTROL SYSTEM (CV)</b>	
2CV-01	Chemical & Volume Control Line 2CVB7A-3"
2CV-02	Chemical & Volume Control Lines 2RY18A-2" and 2CV45B-2"
2CV-03	Chemical & Volume Control Lines 2CV14FB-2" and 2CV14GB-1 1/2"
2CV-04	Chemical & Volume Control Lines 2CVA5AB-2" and 2CVA6AB-2"
2CV-05	Chemical & Volume Control Line 2CVA3B-2"
2CV-06	Chemical & Volume Control Lines 2CV14GA-1 1/2", 2CV14GD-1 1/2", 2CV14FA-2", and 2CV14FD-2"
2CV-07	Chemical & Volume Control Line 2CVA3B-2"
2CV-08	Chemical & Volume Control Line 2CVA5AA-2"

**TABLE 2.4-2  
UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>CHEMICAL &amp; VOLUME CONTROL SYSTEM (CV) [Continued]</b>	
2CV-09	Chemical & Volume Control Lines 2CVA3B-2" and 2CVA3AB-2"
2CV-10	Chemical & Volume Control Line 2CVA7AB-2"
2CV-11	Chemical & Volume Control Lines 2CVA3B-2" and 2CVA6AA-2"
2CV-12	Chemical & Volume Control Line 2CV45B-2"
2CV-13	Chemical & Volume Control Line 2CVA3B-2"
2CV-14	Chemical & Volume Control Line 2CVA3B-2"
2CV-15	Chemical & Volume Control Line 2CVA3B-2"
2CV-16	Chemical & Volume Control Lines 2CV14FC-2" and 2CV14GC-1 1/2"
2CV-17	Chemical & Volume Control Lines 2CV05B-8" and 2CVA1A-6"
2CV-18	Chemical & Volume Control Lines 2CV05B-8", 2CV05CA-6", 2CV98A/BA/BB/C-8", and 2CV99A-8"
2CV-19	Chemical & Volume Control Line 2CV05CB-6"
2CV-20	Chemical & Volume Control Lines 2CV07A-3", 2CV08AA-4", 2CV12AA-3", and 2CV42AA-2"
2CV-21	Chemical & Volume Control Lines 2CV08BA-4", 2CV09A-4", 2CV12AB-3", 2CV42AB-2", and 2CVJ4A-4"
<b>MAIN FEEDWATER SYSTEM (FW)</b>	
2FW-01	Feedwater Lines 2FW03DD-16" and 2FW86AD-16"
2FW-02	Feedwater Lines 2FW03DA-16" and 2FW86AA-16"
2FW-03	Feedwater Lines 2FW86AB-16" and 2FW03DB-16"
2FW-04	Feedwater Lines 2FW03DC-16" and 2FW86AC-16"
2FW-05	Feedwater Lines 2FW81AB-6", 2FW81BB-6", and 2FW87CB-6"
2FW-06	Feedwater Line 2FW87CB-6"
2FW-07	Feedwater Line 2FW87CC-6"
2FW-08	Feedwater Line 2FW87CD-6"
2FW-09	Feedwater Line 2FW87CA-6"
2FW-10	Feedwater Lines 2FW81AC-6", 2FW81BC-6", and 2FW87CC-6"
2FW-11	Feedwater Lines 2FW81AA-6", 2FW81BA-6", and 2FW87CA-6"
2FW-12	Feedwater Lines 2FW81AD-6", 2FW81BD-6", and 2FW87CD-6"

**TABLE 2.4-2  
UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>MAIN STEAM SYSTEM (MS)</b>	
2MS-01	Main Steam Line 2MS01AD-30 1/4"
2MS-02	Main Steam Lines 2MS01BD-30 1/4", 2MS01CD-30 1/4", 2MS07AD-28", 2MS08AD-6", 2MS09AD-6", 2MS10AD-6", 2MS11AD-6", 2MS12AD-6", 2MS13AD-8", and 2MS143AD-12"
2MS-03	Main Steam Line 2MS01AA-30 1/4"
2MS-04	Main Steam Lines 2MS01BA-30 1/4", 2MS01CA-30 1/4", 2MS07AA-28", 2MS08AA-6", 2MS09AA-6", 2MS10AA-6", 2MS11AA-6", 2MS12AA-6", 2MS13AA-8", and 2MS143AA-12"
2MS-05	Main Steam Line 2MS01AB-32 3/4"
2MS-06	Main Steam Lines 2MS01BB-32 3/4", 2MS01CB-32 3/4", 2MS07AB-28", 2MS08AB-6", 2MS09AB-6", 2MS10AB-6", 2MS11AB-6", 2MS12AB-6", 2MS13AB-8", and 2MS143AB-12"
2MS-07	Main Steam Line 2MS01AC-32 3/4"
2MS-08	Main Steam Lines 2MS01BC-32 3/4", 2MS01CC-32 3/4", 2MS07AC-28", 2MS08AC-6", 2MS09AC-6", 2MS10AC-6", 2MS11AC-6", 2MS12AC-6", 2MS13AC-8", and 2MS143AC-12"
<b>REACTOR COOLANT SYSTEM (RC &amp; RY)</b>	
2PZR-01	Pressurizer No. 2RY01S
2RC-01	Primary Coolant System Loop-1 To Steam Gen. No. 2RC01BA
2RC-02	Primary Coolant System Loop-2 To Steam Gen. No. 2RC01BB
2RC-03	Primary Coolant System Loop-3 To Steam Gen. No. 2RC01BC
2RC-04	Primary Coolant System Loop-4 To Steam Gen. No. 2RC01BD
2RC-05	Reactor Coolant Surge Line 2RY11A-14"
2RC-06	Reactor Coolant Lines 2RC21AA-8" and 2RC21BA-8"
2RC-07	Reactor Coolant Lines 2RC28A-3", 2CV10DA-3", 2RC37A-3", 2CV10DB-3", and 2RC36A-3"
2RC-08	Reactor Coolant Lines Inside Containment Loop-1
2RC-09	Reactor Coolant Lines 2RC21AB-8" and 2RC21BB-8"
2RC-10	Reactor Coolant Lines Inside Containment Loop-2
2RC-11	Reactor Coolant Lines 2RC04AB-12" and 2RC05AB-6"; Residual Heat Removal Line 2RH01AB-12"



**TABLE 2.4-2  
UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>REACTOR COOLANT SYSTEM (RC &amp; RY) [Continued]</b>	
2RC-12	Reactor Coolant Lines 2RC21AC-8" and 2RC21BC-8"
2RC-13	Reactor Coolant Lines Inside Containment Loop-3
2RC-14	Reactor Coolant Lines 2RC24AB-4" and 2RY01AB-4"
2RC-15	Reactor Coolant Lines 2RC21AD-8" and 2RC21BD-8"
2RC-16	Reactor Coolant Lines 2RY01B-6" and 2RY01C-4"
2RC-17	Reactor Coolant Lines 2RC24AA-4", 2RY01AA-4", 2RY01AB-4", and 2RY01B-6"
2RC-18	Reactor Coolant Lines Inside Containment Loop-4
2RC-19	Reactor Coolant Line 2RC22AB-1 1/2"
2RC-20	Reactor Coolant Line 2RC22AD-1 1/2"
2RC-21	Reactor Coolant Line 2RC22AB-1 1/2"
2RC-22	Reactor Coolant Lines 2RC05AA-6" and 2RC35AB-6", 2SI03GA-6", and 2SI03GB-6"
2RC-23	Reactor Coolant Line 2RC22AA-1 1/2"
2RC-24	Reactor Coolant Line 2RC22AC-1 1/2"
2RC-27	Reactor Coolant Lines 2RC22AA-1 1/2" and 2RC22AC-1 1/2"
2RC-29	Reactor Coolant Lines 2RC16AC-2" and 2RC16AD-2"
2RC-30	Reactor Coolant Lines 2RC13AA-2", 2RC13AB-2", 2RC13AC-2", and 2RC13AD-2"
2RC-31	Reactor Coolant Lines 2RC14AB-2" (Loop 2) and 2RC26A-2" (Loop 4)
2RC-32	Reactor Coolant Lines 2RY03AA-6", 2RY03AB-6", 2RY03AC-6", 2RY03BA-6", 2RY03BB-6", and 2RY03BC-6"
2RC-35	Reactor Coolant Lines 2RY02A-6", 2RY06A-3", and 2RY02B-3"
2RC-36	Reactor Coolant Lines 2RC14AA-2" and 2CVA3AA-2"
2RC-37	Reactor Coolant Lines 2RC14AD-2" and 2CVA7AA-2"
2RC-41	Reactor Coolant Lines 2RC16AA-2" (Loop 1) and 2RC16AB-2" (Loop 2)
2RC-42	Reactor Coolant Line 2RC14AC-2"
2RCP-01	Reactor Coolant Pumps 2RC01PA, 2RC01PB, 2RC01PC, and 2RC01PD

**TABLE 2.4-2**  
**UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>REACTOR COOLANT SYSTEM (RC &amp; RY) [Continued]</b>	
2RV-01	Reactor Pressure Vessel Hot Leg / Cold Leg Nozzles
2RV-02	Reactor Pressure Vessel Bottom Closure Head
2RV-03	Reactor Pressure Vessel Top Closure Head
2SG-01	Steam Generator No. 2RC01BA
2SG-02	Steam Generator No. 2RC01BB
2SG-03	Steam Generator No. 2RC01BC
2SG-04	Steam Generator No. 2RC01BD
<b>RESIDUAL HEAT REMOVAL SYSTEM (RH)</b>	
2RH-01	Residual Heat Removal Line 2RH01AB-12"
2RH-02	Residual Heat Removal Line 2RH01AA-12"
2RH-03	Residual Heat Removal Lines 2RH03AA-8" and 2RH12A-8"
2RH-04	Residual Heat Removal Lines 2RH01BA-12" and 2RH01CA-16"; 2SI82BA-12"
2RH-05	Residual Heat Removal Lines 2RH02AA-8" and 2RH09AA-8"
2RH-06	Residual Heat Removal Lines 2RH02AB-8", 2RH09AB-8", and 2RH03AB-8"
2RH-07	Residual Heat Removal Lines 2RH03AB-8", 2RH14A-8", and 2RH03AA-8"
2RH-08	Residual Heat Removal Lines 2SI82BB-12", 2RH01BB-12", and 2RH01CB-16"
2RH-09	Residual Heat Removal Line 2RH02AB-8"
2RHP-01	Residual Heat Removal Pumps 2RH01PA and 2RH01PB; Charging Pumps 2CV02P, 2CV01PA, and 2CV01PB
2RHX-01	Residual Heat Exchanger Nos. 2RH02AA and 2RH02AB
<b>SAFETY INJECTION SYSTEM (SI)</b>	
2SI-01	Safety Injection Lines 2RC29AA-10" and 2SI09BA-10"
2SI-02	Safety Injection Lines 2SIA4B-8", 2SI03FA-2", 2RC04AA-12", and 2RC35AA-6"
2SI-03	Safety Injection Line 2SI05DA-6"
2SI-04	Safety Injection Lines 2SI05BA-8", 2SI05CA-8", and 2SI05CD-8"
2SI-05	Safety Injection Lines 2RC29AB-10" and 2SI09BB-10"
2SI-06	Safety Injection Lines 2SI05DB-6" and 2SI18FB-2"

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 2.4-2**  
**UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>SAFETY INJECTION SYSTEM (SI) [Continued]</b>	
2SI-07	Safety Injection Lines 2SI08FA-3", 2SI08FB-3", and 2SI08E-3"
2SI-08	Safety Injection Line 2SI08FA-3"
2SI-09	Safety Injection Lines 2RC29AC-10" and 2SI09BC-10"
2SI-10	Safety Injection Lines 2SI05DC-6" and 2SI18FC-2"
2SI-11	Safety Injection Lines 2SI04D-8" and 2SI03DB-2"
2SI-12	Safety Injection Lines 2SI04A-12", 2SI04B-12", 2SI04C-8", and 2SIA4A-8"
2SI-13	Safety Injection Lines 2RC29AD-10", 2SI09BD-10", and 2SI05DD-6"
2SI-14	Safety Injection Line 2SI05DD-6"
2SI-15	Safety Injection Lines 2SI08JC-1 1/2" and 2RC30AC-1 1/2"
2SI-16	Safety Injection Lines 2SI08JD-1 1/2" and 2RC30AD-1 1/2"
2SI-17	Safety Injection Lines 2SI08JB-1 1/2" and 2RC30AB-1 1/2"
2SI-18	Safety Injection Lines 2SI08HB-2", 2SI08GB-1 1/2", and 2SI08JB-1 1/2"
2SI-19	Safety Injection Lines 2SI08GA-1 1/2", 2SI08HA-2", and 2SI08JA-1 1/2"
2SI-20	Safety Injection Lines 2SI08GC-1 1/2", 2SI08HC-2", 2SI08JC-1 1/2", 2SI08GD-1 1/2", 2SI08HD-2", and 2SI08JD-1 1/2"
2SI-21	Safety Injection Line 2SI03DA-2"
2SI-22	Safety Injection Line 2SI03FB-2"
2SI-23	Safety Injection Lines 2SI18FA-2" and 2SI18FD-2"; Reactor Coolant Line 2RY76A-2"
2SI-24	Safety Injection Lines 2SI06BA-24" and 2SI06BB-24"
2SI-25	Safety Injection Line 2SI05AA-8"
2SI-26	Safety Injection Lines 2SI05BB-8", 2SI05CB-8", and 2SI05CC-8"
2SI-27	Safety Injection Line 2SI08JD-1 1/2"
2SI-28	Safety Injection Lines 2SI09AB-10" and 2SI09AC-10"
2SI-29	Safety Injection Line 2SI08JC-1 1/2"
2SI-30	Safety Injection Lines 2SI09AA-10" and 2SI09AD-10"
2SI-31	Safety Injection Lines 2SI08JA-1 1/2" and 2RC30AA-1 1/2"
2SI-32	Safety Injection Line 2SI05AB-8"

**TABLE 2.4-2  
UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>SAFETY INJECTION SYSTEM (SI) [Continued]</b>	
2SI-33	Safety Injection Line 2SI34A-8"
2SI-34	Safety Injection Lines 2SI01B-24" and 2SI02A-8"
2SI-35	Safety Injection Lines 2SI01B-24", 2SI53AB-14", and 2SI82AB-12"
2SI-36	Safety Injection Lines 2SI01B-24", 2SI53AA-14", 2SI82AA-12", and 2SI01A-8"
2SI-37	Safety Injection Lines 2SIF9A-8", 2SI02BA-6", 2SI02BB-6", and 2SI34A-8"
2SI-38	Safety Injection Lines 2SI02BA-6", 2SI13A-6", 2SI13BA-6", 2SI13BB-6", and 2SI13C-6"
2SI-39	Safety Injection Lines 2SI08B-4", 2SI08CA-4", 2SI08CB-4", 2SI08D-3", and 2CVJ4A-4"
<b>ESSENTIAL SERVICE WATER SYSTEM (SX)</b>	
2SX-01	Essential Service Water Lines 2SX06EA-10", 2SX06CA-14", and 2SX06BA-16"
2SX-02	Essential Service Water Lines 2SX06EC-10", 2SX06DC-10", 2SX08AC-10", and 2SX08BC-10"
2SX-03	Essential Service Water Lines 2SX06EA-10", 2SX06FA-10", 2SX08AA-10", and 2SX08BA-10"
2SX-04	Essential Service Water Lines 2SX06EB-10", 2SX06CB-14", and 2SX06BB-16"
2SX-05	Essential Service Water Lines 2SX06ED-10", 2SX06DD-10", 2SX08AD-10", and 2SX08BD-10"
2SX-06	Essential Service Water Lines 2SX06EB-10", 2SX06FB-10", 2SX08AB-10", and 2SX08BB-10"
2SX-07	Essential Service Water Lines 2SX07CB-10", 2SX07EB-14", and 2SX07FB-16"
2SX-08	Essential Service Water Lines 2SX07BB-10", 2SX07CB-10", 2SX09BB-10", and 2SX09CB-10"
2SX-09	Essential Service Water Lines 2SX07CD-10", 2SX07BD-10", 2SX09CD-10", and 2SX09BD-10"
2SX-10	Essential Service Water Lines 2SX07CA-10", 2SX07EA-14", and SX07FA-16"
2SX-11	Essential Service Water Lines 2SX07CA-10", 2SX07BA-10", 2SX09BA-10", and 2SX09CA-10"
2SX-12	Essential Service Water Lines 2SX07BC-10", 2SX07CC-10", 2SX09BC-10", and 2SX09CC-10"

**TABLE 2.4-2  
UNIT 2 ISI ISOMETRIC AND COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING DESCRIPTION
<b>PRIMARY CONTAINMENT PURGE (VQ)</b>	
2A-VQ-09	Primary Containment Purge Line 2VQ03A-8" and 2VQ05A-8"
2A-VQ-13	Primary Containment Purge Line 2VQ04A-8"
2A-VQ-102	Primary Containment Purge Lines 2VQ01A-48" and 2VQ02A-48"

**TABLE 2.4-3**  
**UNIT 1 CISI COMPONENT DRAWINGS**

DRAWING NUMBER	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 Pen. (P-98) Reactor Pool Area
1-CISI-1000, Sh. 7B	IWE Component Sections Fuel Transfer Tube Pen. (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
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, Shts. 1A Thru 1F	IWE Component Information Table Piping Penetrations
1-CISI-1001, Shts. 1G Thru 1J	IWE Component Information Table Electrical Penetrations
1-CISI-1001, Sh. 1K	IWE Component Information Table Instrument Penetrations
1-CISI-1001, Shts. 1L Thru 1R	IWE Component Information Table Miscellaneous Components

**TABLE 2.4-3  
UNIT 1 CISI COMPONENT DRAWINGS**

DRAWING NUMBER	DRAWING TITLE
1-CISI-1001, Sh. 2A	Electrical Penetration Details Outside Containment Configuration No. 1
1-CISI-1001, Sh. 2B	Elect. Penetration Sections Outside Containment Configuration No. 1
1-CISI-1001, Sh. 3A	Electrical Penetration Details Outside Containment Configuration No. 2
1-CISI-1001, Sh. 3B	Elect. 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	Elect. 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	Elect. 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 Details Personnel Air Locks Configuration No. 5
1-CISI-1001, Sh. 7	Instrument Penetration Details Outside Containment Configuration No's 1, 2 & 3
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	Spare Piping Penetration Details Outside Containment Configuration No. 6
1-CISI-1001, Sh. 12	Spare Piping Penetration Details 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  
UNIT 2 CISI COMPONENT DRAWINGS**

DRAWING NUMBER	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 Pen. (P-98) Reactor Pool Area
2-CISI-1000, Sh. 7B	IWE Component Sections Fuel Transfer Tube Pen. (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, ShTS. 1A THRU 1F	IWE Component Information Table Piping Penetrations
2-CISI-1001, ShTS. 1G THRU 1P	IWE Component Information Table Electrical Penetrations
2-CISI-1001, Sh. 1Q	IWE Component Information Table Instrument Penetrations
2-CISI-1001, ShTS. 1R THRU 1W	IWE Component Information Table Miscellaneous Components
2-CISI-1001, Sh. 2A	Electrical Penetration Details Outside Containment Configuration No. 1



**TABLE 2.4-4  
UNIT 2 CISI COMPONENT DRAWINGS**

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	Spare Piping Penetration Detail Outside Containment Configuration No. 6
2-CISI-1001, Sh. 11	Spare 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, Braidwood 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 (TAP) documents contained in this section have been provided to clarify Braidwood Station's implementation of ASME Section XI requirements. An index which summarizes each technical approach and position is included in Table 2.5-1.

**TABLE 2.5-1  
TECHNICAL APPROACH AND POSITIONS INDEX**

<b>Position Number</b>	<b>Revision Date<sup>2</sup></b>	<b>Status<sup>1</sup></b>	<b>(Program) Description of Technical Approach and Positions</b>
I3T-01	0 7/25/08	Active	<b>(SPT)</b> System Leakage Testing of Non-Isolable Buried Components.
I3T-02	0 7/25/08	Active	<b>(SPT)</b> Valve Seats as Pressurization Boundaries.
I3T-03	0 7/25/08	Active	<b>(ISI)</b> RISI Examination Volumes and Methods.

Note 1: Technical Approach and Position Status Options: Active - Current ISI Program technical approach and position is being utilized at Braidwood Station; Deleted – technical approach and position is no longer being utilized at Braidwood Station.

Note 2: The revision listed is the latest revision of the subject technical approach and position. The date noted in the second column is the date of the ISI Program Plan revision when the technical approach and position was incorporated into the document.

**TECHNICAL APPROACH AND POSITION NUMBER: I3T-01  
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, Braidwood 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).

Braidwood 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-02  
REVISION 0  
(Page 1 of 1)**

**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:**

Braidwood 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, Braidwood Station will perform a VT-2 visual examination of the entire boundary valve body and bonnet (during pressurization up to the valve seat).

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

**COMPONENT IDENTIFICATION:**

Code Class: 1 and 2  
Reference: Braidwood Station Request for Relief I3R-01, Revision 1,  
"Alternative to the ASME Section XI Requirements for Class 1  
and Class 2 Piping Welds"  
Executive Summary, Risk Informed Inservice Inspection  
Program Plan Braidwood 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-01:

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

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

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.

**POSITION**

**Table I3T-03-1: 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 <sup>5</sup> .
High Cycle Mechanical Fatigue	Visual, VT-2	Not Applicable, Note <sup>1</sup>	None currently identified at station.
Erosion Cavitation	Volumetric	Figure 4-16 thru 4-22	None currently identified at station.
Crevice Corrosion Cracking	Volumetric	Figure 4-6 and 4-7	None currently identified at station.
Primary Water Stress Corrosion Cracking	See Note <sup>2</sup>	See Note <sup>2</sup>	See Note <sup>2</sup>
Intergranular or Transgranular Stress Corrosion Cracking	Volumetric	Figure 4-10 thru 4-14	Effectuated components not subject to an additional DM. Only SCC type examinations required for components.
Microbiologically Corrosion	Volumetric	Figure 4-15	See Note <sup>3</sup>
Flow Accelerated Corrosion (FAC)	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 <sup>4,5,6</sup>	Includes expanded exam volume for piping. See Notes <sup>4,5,6</sup>
Socket Welds (All DM)	Visual, VT-2	Not Applicable, Note <sup>1</sup>	See Note <sup>1</sup>

**TECHNICAL APPROACH AND POSITION NUMBER: I3T-03  
REVISION 0  
(Page 1 of 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. Socket welds are not specifically addressed in TR-112657 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-112657 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 Braidwood Station, all components subject to PWSCC (14 in each unit) are classified as High-Risk Group, Risk Category 2.
- 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-112657. 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-112657 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).



### 3.0 WELDS AND COMPONENTS ISI PLAN

The Braidwood 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. Exelon procedure ER-AA-330-002 "Inservice Inspection of Welds and Components", implements the ASME Section XI Component ISI Plan. In addition to the ASME Section XI requirements, Braidwood Station also has an augmented inspection program. For a detailed discussion of the augmented inspection program, see Section 2.2.

#### 3.1 Nonexempt ISI Class Components

As mandated by 10 CFR 50.55a(b)(2)(xi) for ISI Class 1 components, Braidwood Station will utilize the exemption criteria of Subarticle IWB-1220 in the 1989 Edition, No Addenda of ASME Section XI. This exemption criteria shall be used in lieu of the 2001 Edition through the 2003 Addenda of ASME Section XI. The ISI Class 1 components subject to examination are those that are not exempted under the criteria of Subarticle IWB-1220 (See Section 3.1.2 below). The Braidwood Station ISI Class 2 and 3 components identified in ISI CBD's are those not exempted under the criteria of Subarticles IWC-1220 and IWD-1220 in the 2001 Edition through the 2003 Addenda of ASME Section XI. A summary of Braidwood Station Units 1, 2, and 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 Braidwood Station support drawings.

##### 3.1.2 Subarticle IWB-1220 of the 1989 Edition, No Addenda of ASME Section XI provides the following exemptions.

*IWB-1220, Components Exempt from Examination - 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 Braidwood 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 Braidwood Station]*

### 3.2 Risk-Informed Examination Requirements

Piping structural elements that fall under RISI Examination Category R-A are non-exempt Class 1 and 2 piping components as described in Section 3.1 above, and are risk ranked as High (1, 2, and 3), Medium (4 and 5), or 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).

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, which 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 piping structural element examinations are performed in accordance with Relief Request I3R-01.

## **4.0 COMPONENT SUPPORTS ISI PLAN**

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

### **4.1 Nonexempt ISI Class Supports**

The Braidwood Station ISI Class 1, 2, and 3 nonexempt supports are those which do not meet the exemption criteria of Subarticle IWF-1230 of ASME Section XI. A summary of Braidwood Station Units 1, 2, and 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 Braidwood Station individual support detail 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 Class 1, 2, 3, and MC snubbers to be performed in accordance with the Operation and Maintenance of Nuclear Power Plants (O&M), Standard ASME/ANSI O&M, Part 4. As allowed by 10 CFR 50.55a(b)(3)(v), Braidwood Station will use Subsection ISTD, "Inservice Testing of Dynamic Restraints (Snubbers) In Light Water Reactor Power Plants," ASME O&M 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 Braidwood Station Units 1, 2, and Common safety-related snubbers is included in Section 7.0.

Exelon Procedure ER-AA-330-004, "Visual Examination of Technical Specification Snubbers", implements the visual inspection program for safety-related snubbers. Exelon Procedures ER-AA-330-010, "Administration of Snubber Functional Testing", ER-AA-330-011, "Snubber Service Life Monitoring Program," as well as Station procedures, implement the functional testing and service life monitoring requirements for safety-related 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 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 nonintegral attachments for snubbers to be examined in accordance with Subsection IWF of the ASME Section XI. This results in VT-3 visual examination of the snubber attachment hardware including the bolting, pins, and their interface to the clamp, but does not include the component-to-clamp interface.

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 and inspection requirements of the snubber attachment hardware (e.g., bolting and pins) per Paragraphs IWF-5200(c) and IWF-5300(c).

It should be noted that the examination of snubber welded attachments will be performed in accordance with the ASME Section XI Subsections IWB, IWC, and IWD welded attachment examination requirements (e.g.; Examination Categories B-K, C-C, and D-A).

## 5.0 SYSTEM PRESSURE TESTING ISI PLAN

The Braidwood Station System Pressure Testing ISI Plan includes all pressure retaining ASME Section XI, ISI Class 1, 2, and 3 components, with the exception of those specifically excluded by Paragraphs IWA-5110(c), 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 Program 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. Exelon Procedure ER-AA-330-001, "Section XI Pressure Testing," as well as Station procedures, implement the ASME Section XI System Pressure Testing ISI Plan. In addition to the ASME Section XI requirements, Braidwood Station also has an augmented inspection program. For a detailed discussion of the augmented inspection program, see Section 2.2.

This ISI Program Plan also includes a component augmented inspection program information specified by documents other than ASME Section XI. For a detailed discussion of the augmented inspection program, see Section 2.2.

Systems that are borated for the purpose of controlling reactivity are CV, FC, RC, RH, RY, and SI at Braidwood Station.

### 5.1 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 Paragraphs 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 during a system pressure test in accordance with Paragraph IWA-5211(a).

## **6.0 CONTAINMENT ISI PLAN**

The Braidwood Station Containment ISI Plan includes ASME Section XI CISI Class MC pressure retaining components and their integral attachments, and Class CC components and structures, and post-tensioning systems that meet the criteria of Subarticle IWA-1300. This Containment ISI Plan also includes information related to augmented examination areas, component accessibility, and examination review.

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

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"

### **6.1 Nonexempt CISI Class Components**

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

The process for scoping Braidwood Station components for inclusion in the Containment ISI 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)(v).

#### **6.1.1 Identification of CISI Class MC and CC Nonexempt Components**

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

### 6.1.2 Identification of CISI Class MC and CC Exempt Components

Certain containment components or parts of components may be exempted from examination based on design and accessibility per the requirements of Subarticles IWE-1220 and IWL-1220.

The process for exempting Braidwood Station components from the Containment ISI Plan per Subarticles 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.

### 6.2 Augmented Examination Areas

Metal containment components potentially subject to augmented examination per Subarticle 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 Subarticle IWL-2310, if declared to be 'Suspect Areas' by the examiner or the Responsible Engineer.

A significant condition is a condition that is identified as requiring application of additional augmented examination requirements under Subarticles IWE-1240 or IWL-2310.

In the First CISI Interval, a portion of the Braidwood Station Units 1 and 2 containment liner below the moisture barrier at elevation 377' has been identified as an augmented surface area requiring examination in accordance with Subarticle IWE-1240. These surface areas have been categorized in accordance with Table IWE-2500-1, Examination Category E-C, Item Number E4.12, requiring volumetric examination of 100% of the minimum wall thickness locations during each Inspection Period. Additionally, four (4) gouges on the liner plate were recorded in Braidwood Station Unit 2. These areas will be re-inspected per IWE Examination Category E-C. In the Second CISI Interval, augmented surface areas require ultrasonic thickness examinations of 100% of the identified areas each inspection period until the areas examined remain essentially unchanged for the next inspection period. When/If such areas no longer require augmented inspection the examinations and associated extent and frequency of examinations of Category E-A apply for the remainder of the interval.



6.3 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.

Paragraph IWE-1231(a)(3) requires 80% of the pressure-retaining surface are of the Class MC and CC surfaces to remain accessible for either direct or remote visual examination from at least one side for the life of the plant. Braidwood Calculation BRW-98-0531-M has determined the extent of these surfaces accessible for examination.

6.4 Responsible Individual (IWE) and Responsible Engineer (IWL)

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 pressure retaining components, supports, containment structures, post-tensioning systems, system pressure testing, and augmented program components for the Third ISI Interval and the Second CISI Interval at Braidwood Station Units 1, 2, and Common.

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

Examination Category (with Examination Category Description)	Item Number (or Risk Category Number or Augmented Number)	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Examination Category (with 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 Examination 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 Braidwood Station are identified.

Examination Category "NA" is used to identify Augmented ISI examinations and other Braidwood 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 Braidwood Station are identified.

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

Specific abbreviations such as RG1.14, ECCS, MRP-139, 0737, and GL8805 are used to identify Augmented ISI examinations and other Braidwood Station commitments.

(3) Item Number (or Risk Category Number or Augmented Number)  
Description:

Provides the 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.

For Risk-Informed piping examinations, a description of the Risk Category Number is provided.

For augmented inspection commitments, a description of the augmented requirement is provided.

(4) Examination 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 piping structural elements under the RISI Program that are in accordance with the EPRI Topical Report TR-112657, Rev. B-A, TR-1006937, Rev. 0-A, and Code Case N-578-1.

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

(5) Total Number Of Components by System:

Provides the system designator (abbreviations). See Section 2.3, Tables 2.3-1 and 2.3-2 for an explanation of these system abbreviation designators. NOTE: System "ZZ" abbreviation designator is used by System Pressure Testing to include multiple systems examined during Mode 3 inspections.

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/Technical Approach & Position Number:

Provides a listing of Relief Request/TAP Numbers applicable to specific components, the ASME Section XI Item Number, Risk Category Number, or Augmented Number. Relief requests and TAP numbers that generically apply to all components, or an entire class are not listed. If a Relief Request/TAP Number is identified, see the corresponding relief request in Section 8.0 or the TAP number in Section 2.5.

(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 in Table 7.1.3.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON**  
**INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
B-A Pressure Retaining Welds in Reactor Vessel	B1.11	Circumferential Shell Welds (Reactor Vessel)	Volumetric	RC: 3		17
	B1.21	Circumferential Head Welds (Reactor Vessel)	Volumetric	RC: 2		17
	B1.30	Shell-to-Flange Weld (Reactor Vessel)	Volumetric	RC: 1		17
	B1.40	Head-to-Flange Weld (Reactor Vessel)	Volumetric & Surface	RC: 1		17
B-B Pressure Retaining Welds in Vessels Other Than Reactor Vessels	B2.11	Circumferential Shell-To-Head Welds (Pressurizer)	Volumetric	RY: 2		17
	B2.12	Longitudinal Shell-To-Head Welds (Pressurizer)	Volumetric	RY: 2		17
	B2.40	Tube Sheet-To-Head Weld (Steam Generator)	Volumetric	RC: 4		17
B-D Full Penetration Welds of Nozzles in Vessels	B3.90	Nozzle-to-Vessel Welds (Reactor Vessel)	Volumetric	RC: 8		17, 27
	B3.100	Nozzle Inside Radius Section (Reactor Vessel)	Volumetric	RC: 8		17, 28
	B3.110	Nozzle-to-Vessel Welds (Pressurizer)	Volumetric	RY: 6		17
	B3.120	Nozzle Inside Radius Section (Pressurizer)	Volumetric or Enhanced Visual	RY: 6		13, 17
	B3.140	Nozzle Inside Radius Section (Steam Generator)	Volumetric or Enhanced Visual	RC: 8		13 17

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Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
B-G-1 Pressure Retaining Bolting, Greater Than 2 in. In Diameter	B6.10	Closure Head Nuts (Reactor Vessel)	Visual, VT-1	RC: 54		3
	B6.20	Closure Studs (Reactor Vessel)	Volumetric	RC: 54		3
	B6.40	Threads in Flange (Reactor Vessel)	Volumetric	RC: 1		
	B6.50	Closure Washers (Reactor Vessel)	Visual, VT-1	RC: 54		3
	B6.90	Bolts & Studs (Steam Generator)	Volumetric	RC: 8		3
	B6.100	Flange Surface, When Connection Disassembled (Steam Generator)	Visual, VT-1	RC: 8		
	B6.110	Nuts, Bushings, and Washers (Steam Generator)	Visual, VT-1	RC: 8		3
	B6.180	Bolts & Studs (Pumps)	Volumetric	RC: 4		3, 15
	B6.190	Flange Surface, When Connection Disassembled (Pumps)	Visual, VT-1	RC: 4		15
	B6.210	Bolts & Studs (Valves)	Volumetric	RC: 8		3, 15
	B6.220	Flange Surface, When Connection Disassembled (Valves)	Visual, VT-1	RC: 8		3 15
B6.230	Nuts, Bushings, and Washers (Valves)	Visual, VT-1	RC: 8		3, 15	
B-G-2 Pressure Retaining Bolting, 2 in. and Less In Diameter	B7.10	Bolts, Studs, & Nuts (Reactor Vessel)	Visual, VT-1	RC: 7		3
	B7.20	Bolts, Studs, & Nuts (Pressurizer)	Visual, VT-1	RY: 1		3
	B7.50	Bolts, Studs, & Nuts (Piping)	Visual, VT-1	CV: 4 RC: 4 RY: 4 SI: 8		3
	B7.60	Bolts, Studs, & Nuts (Pumps)	Visual, VT-1	RC: 4		3, 16
	B7.70	Bolts, Studs, & Nuts (Valves)	Visual, VT-1	RC: 4 RH: 4 SI: 18		3 16

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
B-K Welded Attachments for Vessels, Piping, Pumps, and Valves	B10.10	Welded Attachments (Pressure Vessels)	Surface or Volumetric	RY: 2		17 29
	B10.20	Welded Attachments (Piping)	Surface	CV: 1 SI: 7		17
B-L-2 Pump Casings	B12.20	Pump Casings (Pumps)	Visual, VT-3	RC: 4		15 16
B-M-2 Valve Bodies	B12.50	Valve Bodies, Exceeding NPS 4 (Valves)	Visual, VT-3	RC: 12 RH: 4 RY: 3 SI: 18		15 16
B-N-1 Interior of Reactor Vessel	B13.10	Vessel Interior (Reactor Vessel)	Visual, VT-3	RC: 1		
B-N-2 Welded Core Support Structures and Interior Attachments to Reactor Vessels	B13.60	Interior Attachments Beyond Beltline Region (Reactor Vessel)	Visual, VT-3	RC: 1		
B-N-3 Removable Core Support Structures	B13.70	Core Support Structure (Reactor Vessel)	Visual, VT-3	RC: 1		
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	RC: 45		
B-P All Pressure Retaining Components	B15.10	System Leakage Test (IWB-5220)	Visual, VT-2	ZZ*	I3T-02	22 23
B-Q Steam Generator Tubing	B16.20	Steam Generator Tubing in U-Tube Design (Steam Generator)	Volumetric Per Tech Specs	RC: 4		

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections (system leakage test).

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**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
C-A Pressure Retaining Welds in Pressure Vessels	C1.10	Shell Circumferential Welds (Pressure Vessels)	Volumetric	RC: 8 RH: 2		17, 26 30
	C1.20	Head Circumferential Welds (Pressure Vessels)	Volumetric	RC: 4 RH: 2		17 30
	C1.30	Tubesheet-to-Shell-Weld Welds (Pressure Vessels)	Volumetric	RC: 4		17
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	RC: 8 RH: 4		17 30
	C2.22	Nozzle Inside Radius Section Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric	RC: 4 RH: 4		6 17 30
C-C Welded Attachments for Vessels, Piping, Pumps, and Valves	C3.10	Welded Attachments to (Pressure Vessels)	Surface	RH: 2		17, 29
	C3.20	Welded Attachments (Piping)	Surface	CS: 3 CV: 2 MS: 20 RH: 10 SI: 10 SX: 14 VQ: 4		17
	C3.30	Welded Attachments (Pumps)	Surface	CS: 2 CV: 2 RH: 2		17



**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Applicable System for Pressure Testing</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
C-H All Pressure Retaining Components	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	AF CC CS CV FC FP IA OG PS RH SI SX ZZ*	I3T-01 I3T-02	20 21 22 24

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections.

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System (Applicable System for Pressure Testing)</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
D-A Welded Attachments for Vessels, Piping, Pumps, and Valves	D1.10	Pressure Vessel Welded Attachments (Pressure Vessels)	Visual, VT-1	CC: 3 DG: 2 FC: 1 RH: 2 SX: 2		2 29
	D1.20	Piping Welded Attachments (Piping)	Visual, VT-1	AF: 2 CC: 65 SX: 52		2
	D1.30	Pump Welded Attachments (Pumps)	Visual, VT-1	AF: 2		
D-B All Pressure Retaining Components	D2.10	System Leakage Test (IWD-5221)	Visual, VT-2	AB AF CC CV DO FC RY SA SX WO ZZ*	I3T-01 I3T-02	21 22

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON**  
**INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
E-A Containment Surfaces*	E1.11	Containment Vessel Pressure Retaining Boundary - Accessible Surface Areas	General Visual	185		
	E1.11	Containment Vessel Pressure Retaining Boundary - Bolted Connections, Surfaces	Visual, VT-3	77		10
	E1.30	Containment Vessel Pressure Retaining Boundary - Moisture Barriers	General Visual	1		
E-C Containment Surfaces Requiring Augmented Examination	E4.11	Containment Surface Areas - Visible Surfaces	Visual, VT-1	7		11
	E4.12	Containment Surface Areas - Surface Area Grid, Minimum Wall Thickness Location	Ultrasonic Thickness	7		12

\*Surface area determined under "Accessible Calculation for IWE/MC Surface Area" Calculation BRW-98-0531-M.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
 INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
F-A Supports	F1.10	Class 1 Piping Supports	Visual, VT-3	CV: 102 RC: 106 RH: 31 RY: 35 SI: 191		1
	F1.20	Class 2 Piping Supports	Visual, VT-3	AF: 39 CS: 48 CV: 57 FW: 36 MS: 40 RH: 60 SI: 160 SX: 158 VQ: 6		1
	F1.30	Class 3 Piping Supports	Visual, VT-3	AF: 31 CC: 351 SX: 410		1 2
	F1.40	Supports Other Than Piping Supports (Class 1, 2, and 3)	Visual, VT-3	AF: 2 CC: 6 CS: 3 CV: 2 DG: 4 FC: 2 FW: 4 RC: 17 RH: 8 RY: 1 SI: 8 SX: 4		1 2

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
L-A Concrete	L1.11	Concrete Surfaces - All Accessible Surface Areas	General Visual	2		
	L1.12	Concrete Surfaces - Suspect Areas (No Suspect Areas Identified)	Detailed Visual	*		
L-B Unbonded Post-Tensioning System	L2.10	Tendon	IWL-2522 Tendon Force Measurement	483		
	L2.20	Tendon - Wire or Strand	IWL-2523.2 Sample Examination and Testing	483		
	L2.30	Tendon - Anchorage Hardware and Surrounding Concrete (One anchorage on each end of tendon)	Detailed Visual	966		
	L2.40	Tendon - Corrosion Protection Medium (Samples taken from each tendon end)	IWL-2525.2(a) Corrosion Protection Analysis	966		
	L2.50	Tendon - Free Water (Samples taken from each tendon end)	IWL-2525.2(b) Free Water Analysis	966		

\* There were no areas identified as Suspect areas for examination. If areas are identified while performing inspections they will be inspected per IWL-2510.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
 INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Risk Category Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
R-A Risk-Informed Piping Examinations	1	Risk Category 1 Elements	See Notes	FW: 128	I3R-01 I3T-03	5
	2	Risk Category 2 Elements	See Notes	AF: 20 FW: 4 RC: 157 RY: 37		7 8 9 14
	4	Risk Category 4 Elements	See Notes	AF: 87 CS: 40 CV: 77 MS: 223 RC: 458 RH: 53 RY: 87 SD: 4 SI: 115		17
	5	Risk Category 5 Elements	See Notes	CV: 138 SI: 280		

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Aug Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
NA 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	NA		9
	RG1.14	Augmented Examination Of Reactor Coolant Pump Flywheel Per Regulatory Guide 1.14 as modified by Braidwood Station License Amendment #118 and Technical Requirements Manual Appendix G	Volumetric or Surface	RC: 4		18
	NRCB 88-08	Augmented Examination of Welds Susceptible to Thermal Stresses in Piping Connected to Reactor Coolant Systems	Volumetric	NA		4
	ECCS	Augmented Examination of Stagnant Borated Class 2 ECCS Piping	Volumetric	CS: 134 CV: 109 RH: 173 SI: 267		19
	MRP-139	Primary System Piping Butt Weld Inspection and Evaluation Guideline (MRP-139)	Bare Metal Visual/ Volumetric	Category D: 4 Category E: 4 Category F: 6		14
	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		21
	GL8805	Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants	Visual, VT-2	RC		22

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-1 - UNIT 1 & COMMON  
INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Aug Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
NA Augmented Components 10 CFR 50.55a	B4.10	Code Case N-729-1, Head with UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds	Visual, VE	1		31
	B4.20	Code Case N-729-1, UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds	Volumetric Surface	79		31
	B15.80	Code Case N-722, RPV bottom-mounted instrument penetrations	Visual, VE	53	I3R-04	32
	B15.90	Code Case N-722, Hot leg nozzle-to-pipe connections	Visual, VE	4		32
	B15.95	Code Case N-722, Cold leg nozzle-to-pipe connections	Visual, VE	4		32



**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
B-A Pressure Retaining Welds in Reactor Vessel	B1.11	Circumferential Shell Welds (Reactor Vessel)	Volumetric	RC: 3		17
	B1.21	Circumferential Head Welds (Reactor Vessel)	Volumetric	RC: 2		17
	B1.30	Shell-to-Flange Weld (Reactor Vessel)	Volumetric	RC: 1		17
	B1.40	Head-to-Flange Weld (Reactor Vessel)	Volumetric & Surface	RC: 1		17
B-B Pressure Retaining Welds in Vessels Other Than Reactor Vessels	B2.11	Circumferential Shell-To-Head Welds (Pressurizer)	Volumetric	RY: 2		17
	B2.12	Longitudinal Shell-To-Head Welds (Pressurizer)	Volumetric	RY: 2		17
	B2.40	Tube Sheet-To-Head Weld (Steam Generator)	Volumetric	RC: 4		17
B-D Full Penetration Welds of Nozzles in Vessels	B3.90	Nozzle-to-Vessel Welds (Reactor Vessel)	Volumetric	RC: 8		17, 27
	B3.100	Nozzle Inside Radius Section (Reactor Vessel)	Volumetric	RC: 8		17, 28
	B3.110	Nozzle-to-Vessel Welds (Pressurizer)	Volumetric	RY: 6		17
	B3.120	Nozzle Inside Radius Section (Pressurizer)	Volumetric or Enhanced Visual	RY: 6		13, 17
	B3.140	Nozzle Inside Radius Section (Steam Generator)	Volumetric or Enhanced Visual	RC: 8		13, 17

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
B-G-1 Pressure Retaining Bolting, Greater Than 2 in. In Diameter	B6.10	Closure Head Nuts (Reactor Vessel)	Visual, VT-1	RC: 53		25
	B6.20	Closure Studs (Reactor Vessel)	Volumetric	RC: 53		25
	B6.40	Threads in Flange (Reactor Vessel)	Volumetric	RC:1		25
	B6.50	Closure Washers (Reactor Vessel)	Visual, VT-1	RC: 53		25
	B6.180	Bolts & Studs (Pumps)	Volumetric	RC: 4		3, 15
	B6.190	Flange Surface, When Connection Disassembled (Pumps)	Visual, VT-1	RC: 4		15
	B6.210	Bolts & Studs (Valves)	Volumetric	RC: 8		3, 15
	B6.220	Flange Surface, When Connection Disassembled (Valves)	Visual, VT-1	RC: 8		3 15
B6.230	Nuts, Bushings, and Washers (Valves)	Visual, VT-1	RC: 8		3, 15	
B-G-2 Pressure Retaining Bolting, 2 in. and Less In Diameter	B7.10	Bolts, Studs, & Nuts (Reactor Vessel)	Visual, VT-1	RC: 7		3
	B7.20	Bolts, Studs, & Nuts (Pressurizer)	Visual, VT-1	RY: 1		3
	B7.30	Bolts, Studs, & Nuts (Steam Generator)	Visual, VT-1	RC: 8		3
	B7.50	Bolts, Studs, & Nuts (Piping)	Visual, VT-1	CV: 4 RC: 4 RY: 4 SI: 9		3
	B7.60	Bolts, Studs, & Nuts (Pumps)	Visual, VT-1	RC: 4		3, 16
	B7.70	Bolts, Studs, & Nuts (Valves)	Visual, VT-1	RC: 6 RH: 4 SI: 16		3 16

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
B-K Welded Attachments for Vessels, Piping, Pumps, and Valves	B10.10	Welded Attachments (Pressure Vessels)	Surface or Volumetric	RY: 2		17 29
	B10.20	Welded Attachments (Piping)	Surface	CV: 1 SI: 8		17
B-L-2 Pump Casings	B12.20	Pump Casings (Pumps)	Visual, VT-3	RC: 4		15 16
B-M-2 Valve Bodies	B12.50	Valve Bodies, Exceeding NPS 4 (Valves)	Visual, VT-3	RC: 14 RH: 4 RY: 3 SI: 16		15 16
B-N-1 Interior of Reactor Vessel	B13.10	Vessel Interior (Reactor Vessel)	Visual, VT-3	RC: 1		
B-N-2 Welded Core Support Structures and Interior Attachments to Reactor Vessels	B13.60	Interior Attachments Beyond Beltline Region (Reactor Vessel)	Visual, VT-3	RC: 1		
B-N-3 Removable Core Support Structures	B13.70	Core Support Structure (Reactor Vessel)	Visual, VT-3	RC: 1		
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	RC: 45		
B-P All Pressure Retaining Components	B15.10	System Leakage Test (IWB-5220)	Visual, VT-2	ZZ*	I3T-02	22 23
B-Q Steam Generator Tubing	B16.20	Steam Generator Tubing in U-Tube Design (Steam Generator)	Volumetric Per Tech Specs	RC: 4		

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections (system leakage test).

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
C-A Pressure Retaining Welds in Pressure Vessels	C1.10	Shell Circumferential Welds (Pressure Vessels)	Volumetric	RC: 12 RH: 2		17 30
	C1.20	Head Circumferential Welds (Pressure Vessels)	Volumetric	RC: 4 RH: 2		17 30
	C1.30	Tubesheet-to-Shell-Weld Welds (Pressure Vessels)	Volumetric	RC: 4		17
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	RC: 12 RH: 4		17 30
	C2.22	Nozzle Inside Radius Section Without Reinforcing Plate, Greater Than 1/2" Nominal Thickness (Pressure Vessels)	Volumetric	RC: 4 RH: 4		6 17 30
C-C Welded Attachments for Vessels, Piping, Pumps, and Valves	C3.10	Welded Attachments (Pressure Vessels)	Surface	RH: 2		17, 29
	C3.20	Welded Attachments (Piping)	Surface	CS: 5 CV: 2 FW: 4 MS: 20 RH: 9 SI: 9 SX: 12 VQ: 4		17
	C3.30	Welded Attachments (Pumps)	Surface	CS: 2 CV: 2 RH: 2		17

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Applicable System for Pressure Testing	Relief Request/ TAP Number	Notes
C-H All Pressure Retaining Components	C7.10	System Leakage Test (IWC-5220)	Visual, VT-2	AF CC CS CV FC FP IA OG PS RH SI SX ZZ*	I3T-01 I3T-02	20 21 22 24

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections.

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System (Applicable System for Pressure Testing)</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
D-A Welded Attachments for Vessels, Piping, Pumps, and Valves	D1.10	Welded Attachments (Pressure Vessels)	Visual, VT-1	CC: 2 DG: 2 FC: 1 RH: 2 SX: 2		29
	D1.20	Welded Attachments (Piping)	Visual, VT-1	AF: 2 CC: 2 SX: 15		
	D1.30	Welded Attachments (Pumps)	Visual, VT-1	AF: 2		
D-B All Pressure Retaining Components	D2.10	System Leakage Test (IWD-5221)	Visual, VT-2	AB AF CC CV DO FC RY SA SX ZZ*	I3T-01 I3T-02	21 22

\* System "ZZ" abbreviation designator is used by Pressure Testing to include multiple systems examined during Mode 3 inspections.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Item Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
E-A Containment Surfaces*	E1.11	Containment Vessel Pressure Retaining Boundary - Accessible Surface Areas	General Visual	185		
	E1.11	Containment Vessel Pressure Retaining Boundary - Bolted Connections, Surfaces	Visual, VT-3	122		10
	E1.30	Containment Vessel Pressure Retaining Boundary - Moisture Barriers	General Visual	1		
E-C Containment Surfaces Requiring Augmented Examination	E4.11	Containment Surface Areas - Visible Surfaces	Visual, VT-1	22		11
	E4.12	Containment Surface Areas - Surface Grid, Minimum Wall Thickness Location	Ultrasonic Thickness	22		12

\*Surface area determined under "Accessible Calculation for IWE/MC Surface Area" Calculation BRW-98-0531-M.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
F-A Supports	F1.10	Class 1 Piping Supports	Visual, VT-3	CV: 117 RC: 112 RH: 31 RY: 37 SI: 174		1
	F1.20	Class 2 Piping Supports	Visual, VT-3	AF: 37 CS: 61 CV: 62 FW: 115 MS: 40 RH: 68 SI: 151 SX: 181 VQ: 6		1
	F1.30	Class 3 Piping Supports	Visual, VT-3	AF: 43 CC: 48 SX: 288		1
	F1.40	Supports Other Than Piping Supports (Class 1, 2, and 3)	Visual, VT-3	AF: 2 CC: 4 CS: 2 CV: 2 DG: 4 FC: 2 FW: 4 RC: 17 RH: 8 RY: 1 SI: 8 SX: 4		1



**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

Examination Category (with Examination Category Description)	Item Number	Description	Exam Requirements	Total Number of Components by System	Relief Request/ TAP Number	Notes
L-A Concrete	L1.11	Concrete Surfaces - All Accessible Surface Areas	General Visual	2		
	L1.12	Concrete Surfaces - Suspect Areas (No Suspect Areas Identified)	Detailed Visual	*		
L-B Unbonded Post Tensioning System	L2.10	Tendon	IWL-2522 Tendon Force Measurement	483		
	L2.20	Tendon - Wire or Strand	IWL-2523.2 Sample Examination and Testing	483		
	L2.30	Tendon - Anchorage Hardware and Surrounding Concrete (One anchorage on each end of tendon)	Detailed Visual	966		
	L2.40	Tendon - Corrosion Protection (Samples taken from each tendon end)	IWL-2525.2(a) Corrosion Protection Analysis	966		
	L2.50	Tendon - Free Water (Samples taken from each tendon end)	IWL-2525.2(b) Free Water Analysis	966		

\* There were no areas identified as Suspect areas for examination. If areas are identified while performing inspections they will be inspected per IWL-2510.

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Risk Category Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
R-A  Risk-Informed Piping Examinations	1	Risk Category 1 Elements	See Notes	FW: 236	I3R-01 I3T-03	5
	2	Risk Category 2 Elements		AF: 20 RC: 161 RY: 37		7 8 9
	4	Risk Category 4 Elements	See Notes	AF: 92 CS: 42 CV: 88 MS: 220 RC: 475 RH: 47 RY: 77 SI: 113	14 17	
	5	Risk Category 5 Elements	See Notes	CV: 136 SI: 268		

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2  
INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Aug Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
NA 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	NA		9
	RG1.14	Augmented Examination Of Reactor Coolant Pump Flywheel Per Regulatory Guide 1.14 as modified by Braidwood Station License Amendment #118 and Technical Requirements Manual Appendix G	Volumetric or Surface	RC: 4		18
	NRCB 88-08	Augmented Examination of Welds Susceptible to Thermal Stresses in Piping Connected to Reactor Coolant Systems	Volumetric	NA		4
	ECCS	Augmented Examination of Stagnant Borated Class 2 ECCS Piping	Volumetric	CS: 142 CV: 128 RH: 168 SI: 241		19
	MRP-139	Primary System Piping Butt Weld Inspection and Evaluation Guideline (MRP-139)	Bare Metal Visual or Volumetric	Category D: 4 Category E: 4 Category F: 6		14
	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		21
	GL8805	Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants	Visual, VT-2	RC		22

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-2 - UNIT 2**  
**INSERVICE INSPECTION SUMMARY TABLE**

<b>Examination Category (with Examination Category Description)</b>	<b>Aug Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Total Number of Components by System</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
NA Augmented Components 10 CFR 50.55a	B4.10	Code Case N-729-1, Head with UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds	Visual, VE	1		31
	B4.20	Code Case N-729-1, UNS N06600 nozzles and UNS N06082 or UNS W86182 partial penetration welds	Volumetric Surface	79		31
	B15.80	Code Case N-722, RPV bottom-mounted instrument penetrations	Visual, VE	53	I3R-04	32
	B15.90	Code Case N-722, Hot leg nozzle-to-pipe connections	Visual, VE	4		32
	B15.95	Code Case N-722, Cold leg nozzle-to-pipe connections	Visual, VE	4		32
	B15.120	Code Case N-722, Bottom Channel Head Drain Tube penetration	Visual, VE	4		32

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

Note #	Note Summary
1	ISI snubber visual examinations and functional testing are performed in accordance with the ASME O&M Code, Subsection ISTD Program. The number of Braidwood Station Unit 1, 2, and Common supports identified include snubbers for the visual examination and functional testing of the integral and nonintegral attachments per Paragraphs IWF-5200(c), IWF-5300(c), and IWF-2500(a). The snubbers are scheduled and administratively tracked in the ISI Program; however, the ASME O&M Code, Subsection ISTD Program will be the mechanism for actually performing the visual examinations and functional testing scheduled within the ISI program. For a detailed discussion of the snubber program, see Section 4.2.
2	The Braidwood Station Unit 1 population counts include those components that are common to both units (typically designated as "Common" or "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 (Unit 1) and 53 (Unit 2) 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	With the implementation of the RISI Program, the NRC Bulletin 88-08 augmented inspection commitment will no longer be required at Braidwood Station. The RISI Program completely subsumed this requirement based on the fact that the Degradation Mechanism assessment and Risk Categorization involved full assessment for Thermal Transients and Thermal Stratification, Cycling, and Striping. Thus, these piping structural elements have been 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 NRC Bulletin 88-08.
5	The population counts reported represents the number of nonexempt circumferential welds (piping structural elements). Longitudinal welds are also subject to examination, but actual counts are not reported here. Braidwood 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 Number C2.22 requires volumetric examination of the nozzle inner radii of nozzles without reinforcing plates in vessels with nominal thickness > 1/2 inches. 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 an Examination Category C-B, Item Number C2.22 component. However, these nozzles will receive a system leakage test during each inspection period to verify structural integrity.
7	For the Third Inspection Interval, Braidwood 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 has been 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).
8	Examination methods 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.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

Note #	Note Summary
9	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 have been evaluated under the RISI methodology and have been 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 have been 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.
10	Containment bolted connections that are disassembled during the scheduled performance of the examinations in Item Number E1.11 must be examined using the VT-3 method. Flaws or degradation identified during the VT-3 examination must be examined in accordance with the VT-1 examination method, using the criteria in the material specification or IWB-3517.1 to evaluate bolting flaws or degradation. In lieu of performing the required VT-3 during scheduled E1.11 examinations the VT-3 of containment bolted connections may be performed whenever containment bolted connections are disassembled for any reason. These modifications are required by 10 CFR 50.55a(b)(2)(ix)(G) and 10 CFR 50.55a(b)(2)(ix)(H).
11	Item Number E4.11 requires VT-1 visual examination in lieu of Detailed Visual examination, as modified by 10 CFR 50.55a(b)(2)(ix)(G).
12	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).
13	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 Numbers 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.
14	Braidwood Station has committed to comply with the criteria of MRP-139 for welds that are potentially susceptible to PWSCC. The MRP-139 requirements are independent from the RISI Program, and these examinations will be performed in addition to the RISI Program examinations, unless dual crediting can occur for single examinations that meet the individual requirements of both the RISI Program and MRP-139. All pressurizer dissimilar metal welds have been mitigated from PWSCC through application of preemptive full structural weld overlays.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>																																				
15	<p>Table IWB-2500-1, Examination Category B-G-1, Note 4 allows limiting pressure retaining bolting examinations to those components selected for examination under Examination Categories B-B, B-L-2 and B-M-2.</p> <p>Pumps and valves shall be grouped in accordance with Examination Categories B-L-2 and B-M-2 as follows:</p> <table style="margin-left: auto; margin-right: auto; border: none;"> <thead> <tr> <th colspan="2" style="text-align: left;"><u><b>EXAMINATION CATEGORY B-L-2</b></u></th> <th colspan="2" style="text-align: left;"><u><b>EXAMINATION CATEGORY B-M-2</b></u></th> </tr> </thead> <tbody> <tr> <td>1RC01PA</td> <td>2RC01PA</td> <td>1RC8001A</td> <td>2RC8001A</td> </tr> <tr> <td>1RC01PB</td> <td>2RC01PB</td> <td>1RC8001B</td> <td>2RC8001B</td> </tr> <tr> <td>1RC01PC</td> <td>2RC01PC</td> <td>1RC8001C</td> <td>2RC8001C</td> </tr> <tr> <td>1RC01PD</td> <td>2RC01PD</td> <td>1RC8001D</td> <td>2RC8001D</td> </tr> <tr> <td></td> <td></td> <td>1RC8002A</td> <td>2RC8002A</td> </tr> <tr> <td></td> <td></td> <td>1RC8002B</td> <td>2RC8002B</td> </tr> <tr> <td></td> <td></td> <td>1RC8002C</td> <td>2RC8002C</td> </tr> <tr> <td></td> <td></td> <td>1RC8002D</td> <td>2RC8002D</td> </tr> </tbody> </table>	<u><b>EXAMINATION CATEGORY B-L-2</b></u>		<u><b>EXAMINATION CATEGORY B-M-2</b></u>		1RC01PA	2RC01PA	1RC8001A	2RC8001A	1RC01PB	2RC01PB	1RC8001B	2RC8001B	1RC01PC	2RC01PC	1RC8001C	2RC8001C	1RC01PD	2RC01PD	1RC8001D	2RC8001D			1RC8002A	2RC8002A			1RC8002B	2RC8002B			1RC8002C	2RC8002C			1RC8002D	2RC8002D
<u><b>EXAMINATION CATEGORY B-L-2</b></u>		<u><b>EXAMINATION CATEGORY B-M-2</b></u>																																			
1RC01PA	2RC01PA	1RC8001A	2RC8001A																																		
1RC01PB	2RC01PB	1RC8001B	2RC8001B																																		
1RC01PC	2RC01PC	1RC8001C	2RC8001C																																		
1RC01PD	2RC01PD	1RC8001D	2RC8001D																																		
		1RC8002A	2RC8002A																																		
		1RC8002B	2RC8002B																																		
		1RC8002C	2RC8002C																																		
		1RC8002D	2RC8002D																																		

**ISI Program Plan  
Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3  
INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

Note #	Note Summary																																																																																																																		
16	<p>Table IWB-2500-1, Examination Category B-G-2, Note 2 allows limiting pressure retaining bolting examinations to those components selected for examination under Examination Categories B-B, B-L-2 and B-M-2.</p> <p>Pumps and valves shall be grouped in accordance with Examination Categories B-L-2 and B-M-2 as follows:</p> <table border="0" data-bbox="373 516 1556 1101"> <thead> <tr> <th colspan="2"><u>EXAMINATION CATEGORY B-L-2</u></th> <th colspan="4"><u>EXAMINATION CATEGORY B-M-2</u></th> </tr> </thead> <tbody> <tr> <td>1RC01PA</td> <td>2RC01PA</td> <td>1RC8003A</td> <td>2RC8003A</td> <td>1SI8841A</td> <td>2SI8841A</td> </tr> <tr> <td>1RC01PB</td> <td>2RC01PB</td> <td>1RC8003B</td> <td>2RC8003B</td> <td>1SI8841B</td> <td>2SI8841B</td> </tr> <tr> <td>1RC01PC</td> <td>2RC01PC</td> <td>1RC8003C</td> <td>2RC8003C</td> <td></td> <td></td> </tr> <tr> <td>1RC01PD</td> <td>2RC01PD</td> <td>1RC8003D</td> <td>2RC8003D</td> <td>1SI8948A</td> <td>2SI8948A</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1SI8948B</td> <td>2SI8948B</td> </tr> <tr> <td></td> <td></td> <td>1RH8701A</td> <td>2RH8701A</td> <td>1SI8948C</td> <td>2SI8948C</td> </tr> <tr> <td></td> <td></td> <td>1RH8701B</td> <td>2RH8701B</td> <td>1SI8948D</td> <td>2SI8948D</td> </tr> <tr> <td></td> <td></td> <td>1RH8702B</td> <td>2RH8702B</td> <td>1SI8956A</td> <td>2SI8956A</td> </tr> <tr> <td></td> <td></td> <td>1RH8702A</td> <td>2RH8702A</td> <td>1SI8956B</td> <td>2SI8956B</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1SI8956C</td> <td>2SI8956C</td> </tr> <tr> <td></td> <td></td> <td>1RY8010A</td> <td>2RY8010A</td> <td>1SI8956D</td> <td>2SI8956D</td> </tr> <tr> <td></td> <td></td> <td>1RY8010B</td> <td>2RY8010B</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>1RY8010C</td> <td>2RY8010C</td> <td>1SI8949A</td> <td>2SI8949A</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1SI8949B</td> <td>2SI8949B</td> </tr> <tr> <td></td> <td></td> <td>1SI8818A</td> <td>2SI8818A</td> <td>1SI8949C</td> <td>2SI8949C</td> </tr> <tr> <td></td> <td></td> <td>1SI8818B</td> <td>2SI8818B</td> <td>1SI8949D</td> <td>2SI8949D</td> </tr> <tr> <td></td> <td></td> <td>1SI8818C</td> <td>2SI8818C</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>1SI8818D</td> <td>2SI8818D</td> <td></td> <td></td> </tr> </tbody> </table>	<u>EXAMINATION CATEGORY B-L-2</u>		<u>EXAMINATION CATEGORY B-M-2</u>				1RC01PA	2RC01PA	1RC8003A	2RC8003A	1SI8841A	2SI8841A	1RC01PB	2RC01PB	1RC8003B	2RC8003B	1SI8841B	2SI8841B	1RC01PC	2RC01PC	1RC8003C	2RC8003C			1RC01PD	2RC01PD	1RC8003D	2RC8003D	1SI8948A	2SI8948A					1SI8948B	2SI8948B			1RH8701A	2RH8701A	1SI8948C	2SI8948C			1RH8701B	2RH8701B	1SI8948D	2SI8948D			1RH8702B	2RH8702B	1SI8956A	2SI8956A			1RH8702A	2RH8702A	1SI8956B	2SI8956B					1SI8956C	2SI8956C			1RY8010A	2RY8010A	1SI8956D	2SI8956D			1RY8010B	2RY8010B					1RY8010C	2RY8010C	1SI8949A	2SI8949A					1SI8949B	2SI8949B			1SI8818A	2SI8818A	1SI8949C	2SI8949C			1SI8818B	2SI8818B	1SI8949D	2SI8949D			1SI8818C	2SI8818C					1SI8818D	2SI8818D		
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17	Braidwood Station will incorporate Code Case N-460, which provides Alternate Examination Coverage for Class 1 and 2 Welds.																																																																																																																		
18	NRC Regulatory Guide 1.14, Reactor Coolant Pump Flywheel Integrity as modified by the requirements of Braidwood Station License Amendment #118 and Technical Requirements Manual Appendix G.																																																																																																																		



**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
19	<p>The NRC has expressed a concern in lines that contain stagnant borated water. Braidwood Station will perform augmented volumetric examinations on Class 2 ECCS systems; Containment Spray (CS), Chemical and Volume Control (CV), Residual Heat Removal (RH) and Safety Injection (SI) that are not currently subject to volumetric examination as required by ASME Section XI. The inspections shall include seven and one-half percent (7.5%) sampling of the total population of circumferential welds &gt; 4" nominal pipe size which contain stagnant borated water. Nominal pipe wall thickness and pressure/temperature exemptions do not apply.</p> <p>Note: Commitment to be maintained after the implementation of Risk-Informed ISI as this evaluation did not address the Class 2 components with wall thickness &lt; 0.375".</p>
20	<p>Footnote 1 of table IWC-2500-1, Examination Category C-H, requires the system parts to be VT-2 visually examined by those other than open ended portions of systems. Interpretation XI-1-89-30 supports the approach of excluding open ended portions of Class 2 systems from normal periodic VT-2 visual examination.</p> <p>The definition of "open ended" in ASME Section XI, Subsection IWA-9000 is a condition of piping which permits free discharge. Therefore, open ended piping up to the first isolation valve on Class 2 systems is excluded from the system pressure testing program per Footnote 1 as discussed above. Since check valves in discharge lines still permit free discharge flow, these valves do not qualify as an isolation valve for the purpose of applying Footnote 1 of Table IWC-2500-1, Examination Category C-H. The excluded Class 2 piping thus extends up to the next isolation point in discharge lines when the last valve in the piping is a check valve (Reference the Containment Spray discharge piping and ring headers for an example of this configuration).</p>

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**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
21	<p>Braidwood Station UFSAR Section E.77 addresses the requirement to implement a station leakage inspection program. The program is required as part of Braidwood Station's commitment to NUREG-0737, TMI Action Plan, Section III.D.1.1, Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized Water Reactors and Boiling Water Reactors.</p> <p>UFSAR Section E.77 outlines the specific inspection requirements of the leakage inspection program and the systems, or portions of systems, which the program shall inspect. This documentation provides the licensing basis for the scope of Braidwood Station's NUREG-0737 program. Systems inspected are limited to those listed in E.77. To define a "system", Braidwood Station component numbers and piping line numbers, as shown on the P&amp;IDs, shall detail which system an individual component or line is a part of for the purpose of applying the inspection requirements of UFSAR Section E.77 and NUREG-0737.</p> <p>Braidwood Station Unit 1 Systems or portions of systems subject to the augmented testing of NUREG-0737 are included on P&amp;IDs M-46 Sheets 1A, 1B, and 1C; M-47 Sheet 2; M-48 Sheet 57; M-61 Sheets 1A, 1B, 2, 3, and 4; M-62; M-63 Sheets 1A, 1B, and 1C; M-64 Sheets 1, 2, 3A, 3B, 4A, 4B, 5, 6, and 7; N-65 Sheets 1B and 2A; M-68 Sheets 1A, 1B, and 6; M-69 Sheet 1, 2, and 3; M-70 Sheet 1; M-82 Sheet 2 and 3; and M-2069 Sheet 5.</p> <p>Braidwood Station Unit 2 Systems or portions of systems subject to the augmented testing of NUREG-0737 are included on P&amp;IDs M-82 Sheet 6; M-129 Sheets 1A and 1C; M-136 Sheet 1, 2, 3, and 4; M-137; M-138 Sheets 1, 2, 3A, 3B, 4A, 4B, 5A, 5B, 6, and 7; M-140 Sheets 1A, 1B, and 5; and M-141 Sheet 1; and N-150 Sheet 2</p>

**TABLE 7.1-3  
INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
22	<p>Generic Letter 88-05 dated March 17, 1988 addresses boric acid corrosion of carbon steel reactor pressure boundary components in pressurized water reactors. Per the Braidwood Station response to Generic Letter 88-05, Commonwealth Edison letter from W. Morgan to B. Davis dated May 31, 1988 (NTS Item #456-104-88-00500), a pre-outage VT-2 visual examination shall be performed to locate evidence of boric acid leakage from the reactor coolant pressure boundary. ASME Section XI also requires a VT-2 visual examination of all Class 1 components prior to reactor start-up. For those portions of the reactor coolant pressure boundary that are ASME Class 2 as defined by UFSAR Section 5.2, a post-outage VT-2 visual examination shall also be performed to locate evidence of boric acid leakage.</p> <p>Leakage from systems containing boric acid results in residue and crystallization accumulations. By performing a VT-2 visual inspection prior to entering an outage (a station augmented inspection commitment as outlined above), any evidence of boric acid accumulations will be found and investigated to determine the source of leakage before normal outage maintenance activities can clean off the crystals and residue. These visual examinations are performed using certified VT-2 visual examiners in accordance with the Exelon VT-2 procedure. This procedure utilizes ASME Section XI VT-2 certified visual examiners and has proven successful in locating evidence of boric acid leakage in the past. Since this augmented inspection is performed solely for the purpose of detecting evidence of boric acid leakage, the system is not required to be pressurized provided any evidence of boric acid accumulations is evaluated and the source of the leakage is determined. This action may require pressurizing the system as part of the evaluation process.</p> <p>Braidwood Station Unit 1 systems or portions of systems subject to the augmented testing of Generic Letter 88-05 are included on P&amp;IDs M-60 Sheets 1A, 1B, 2, 3, 4, and 5; M-61 Sheets 2, 3, 4, 5, and 6; M-62; M-64 Sheets 1, 2, 3B, and 5; M-68 Sheets 1A, 1B, and 7; and M-2060 Sheets 6, 7, 8, 17, and 18.</p> <p>Braidwood Station Unit 2 systems or portions of systems subject to the augmented testing of Generic Letter 88-05 are included on P&amp;IDs M-135 Sheets 1A, 1B, 2, 3, 4, and 5; M-136 Sheets 2, 3, 4, 5, and 6; M-137; M-138 Sheets 1, 2, 3B, 5A, and 5C; M-140 Sheets 1A, 1B, and 6; and M-2135 Sheets 6, 7, 8, 17, and 18.</p>

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Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3  
INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

Note #	Note Summary
23	<p>Paragraph IWB-5221(a) requires that for the 10-year interval system pressure test, the system shall be pressurized to a pressure not less than the pressure corresponding to 100% rated reactor power. Paragraph IWB-5222(b) requires that the boundary subject to test pressurization during this test shall extend to all Class 1 pressure retaining components within the system boundary.</p> <p>Certain portions of the ISI Class 1 boundary are normally isolated during the periodic system leakage test. Per Paragraph IWB-5222(b), these portions of the system are required to be pressurized and inspected once per 10-year interval. Typically, these portions of the Class 1 boundary are emergency core cooling system (ECCS) injection lines which are isolated from the reactor coolant pressure boundary by two check valves or valves whose logic is linked together. During the Class 1 system leakage test, the inboard valve is closed and these segments of lines are not pressurized. Also, the ECCS systems are not typically tested during an injection to the reactor vessel but rather during a test mode line up, and thus the Class 1 isolated line segments are not pressurized during the ECCS system test either. The pressure retaining boundary during the system leakage test shall correspond to the reactor coolant system boundary, with all valves in the normal position, which is required for normal reactor operation startup. The VT-2 visual examination shall, however, extend to and include the second closed valve at the boundary extremity.</p> <p>Through the use of jumper hoses, an external test rig, or an abnormal valve line-up, the isolated portions of the Class 1 boundary shall be pressurized once every 10-year inspection interval. The test pressure shall be the same test pressure as that of the Class 1 system leakage test per Paragraph IWB-5222(b). These portions of lines are Class 1 due to their reactor coolant isolation function. They are not made Class 1 due to the connected ECCS system safety function.</p> <p>They are also designed and installed to withstand the pressures associated with isolating the reactor coolant system. Taking into account the Class 1 boundary isolation function of these lines, the nominal operating pressure of these segments when performing their Class 1 safety function would be the normal reactor coolant pressure as required by the code case. Therefore, any special tests performed on these lines shall be performed at minimum pressure associated with normal reactor coolant pressure (approx. 2235 psig).</p>
24	<p>Table IWC-2500-1, Examination Category C-H, requires a VT-2 visual examination of all components within the pressure retaining boundary be performed during a system leakage test each inspection period.</p> <p>The Positive Displacement Charging Pump has been Out-of-Service since startup and no periodic tests are being performed on the pump. Therefore, the discharge piping as bounded by the Positive Displacement pump, discharge check valve 1(2)CV8497, discharge bypass to Volume Control Tank isolation valve 1(2)CV8109, and pressure relief valve 1(2)CV8118 is excluded from periodic system pressure testing. However, if Braidwood Station places the Positive Displacement Charging Pump back into service at some future date, this discharge piping will be subject to normal periodic system pressure testing and VT-2 visual examination.</p> <p>Augmented testing per NUREG-0737 are still required to be performed on the subject boundary.</p>
25	<p>The Braidwood Station Unit 2 RPV head stud was stuck in place, total number of studs and associated components (i.e. nuts, washers, etc.) is 53 until existing stud is replaced.</p>

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
26	Babcock & Wilcox, Canada Engineering Evaluation CM9015189-B2 was used to determine the classification of Braidwood Station Unit 1 Steam Generator lower shell-to-transition cone welds are not located at gross structural discontinuities as defined in ASME Section III NB-3213.2 and can be removed from the Examination Category C-A Item Number C1.10 examination population as permitted in Table IWC-2500-1 Examination Category C-A Note 2.
27	As allowed by Code Case N-613-1, Braidwood Station will perform a volumetric examination using a reduced examination volume (A-B-C-D-E-F-G-H) of Figures 1, 2, and 3 of the Code Case in lieu of the previous examination volumes of ASME Section XI, Figures IWB-2500-7(a), (b), and (c).
28	As allowed by Code Case N-648-1, Braidwood Station will perform a visual examination with enhanced magnification (EVT-1) in lieu of a volumetric examination in ASME Section XI.
29	As allowed by Code Case N-700, Braidwood Station will select only one welded attachment of only one of the multiple vessels for examination. For single vessels, only one welded attachment will be selected for examination.
30	As allowed by Code Case N-706, Braidwood Station will perform a visual examination (VT-2) each period in lieu of the volumetric and/or volumetric and surface examinations of ASME Section XI. Note that the alternative requirements detailed in Table 1 of the Code Case apply <u>only</u> to the RH system residual heat exchanger components.

**ISI Program Plan**  
**Braidwood Station Units 1 & 2, Third Interval**

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

Note #	Note Summary
31	<p>Apply requirements of Code Case N-729-1 as modified below:</p> <p>Note 9 of ASME Code Case N-729-1 shall not be implemented.</p> <p>Instead of the specified 'examination method' requirements for volumetric and surface examinations in Note 6 of Table 1 of Code Case N-729-1, the licensee shall perform volumetric and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Figure 2 of ASME Code Case N-729-1. A demonstrated volumetric or surface leak path assessment through all J-groove welds shall be performed. If a surface examination is being substituted for a volumetric examination on a portion of a penetration nozzle that is below the toe of the J-groove weld [Point E on Figure 2 of ASME Code Case N-729-1], the surface examination shall be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically.</p> <p>By September 1, 2009, ultrasonic examinations shall be performed using personnel, procedures and equipment that have been qualified by blind demonstration on representative mockups using a methodology that meets the conditions specified in (10 CFR 50.55a(g)(6)(ii)(D)(3)(i) through 10 CFR 50.55a(g)(6)(ii)(D)(4)(iv), instead of the qualification requirements of Paragraph -2500 of ASME Code Case N-729-1. References herein to Section XI, Appendix VIII shall be to the 2004 Edition with no Addenda of the ASME BPV Code.</p> <p>The specimen set shall have an applicable thickness qualification range of +25 percent to -40 percent for nominal depth through-wall thickness. The specimen set shall include geometric and material conditions that normally require discrimination from primary water stress corrosion cracking (PWSCC) flaws.</p> <p>The specimen set shall have a minimum of ten (10) flaws which provide an acoustic response similar to PWSCC indications. All flaws shall be greater than 10 percent of the nominal pipe wall thickness. A minimum of 20 percent of the total flaws shall initiate from the inside surface and 20 percent from the outside surface. At least 20 percent of the flaws shall be in the depth ranges of 10-30 percent through wall thickness and at least 20 percent within a depth range of 31-50 percent through wall thickness. At least 20 percent and no more than 40 percent of the flaws shall be oriented axially.</p> <p>Procedures shall identify the equipment and essential variables and settings used for the qualification, and are consistent with Subarticle VIII-2100 of Section XI, Appendix VIII. The procedure shall be requalified when an essential variable is changed outside the demonstration range as defined by Subarticle VIII-3130 of Section XI, Appendix VIII and as allowed by Articles VIII-4100, VIII-4200 and VIII-4300 of Section XI, Appendix VIII. Procedure qualification shall include the equivalent of at least three personnel performance demonstration test sets. Procedure qualification requires at least one successful personnel performance demonstration.</p> <p>Personnel performance demonstration test acceptance criteria shall meet the personnel performance demonstration detection test acceptance criteria of Table VIII-S10-1 of Section XI, Appendix VIII, Supplement 10. Examination procedures, equipment, and personnel are qualified for depth sizing and length sizing when the RMS error, as defined by Subarticle VIII-3120 of Section XI, Appendix VIII, of the flaw depth measurements, as compared to the true flaw depths, do not exceed 1/8 inch (3 mm), and the root mean square (RMS) error of the flaw length measurements, as compared to the true flaw lengths, do not exceed 3/8 inch (10 mm), respectively.</p> <p>If flaws attributed to PWSCC have been identified, whether acceptable or not for continued service under Paragraphs -3130 or -3140 of ASME Code Case N-729-1, the re-inspection interval must be each refueling outage instead of the re-inspection intervals required by Table 1, Note (8) of ASME Code Case N-729-1.</p> <p>Appendix I of ASME Code Case N-729-1 shall not be implemented without prior NRC approval.</p>

**TABLE 7.1-3**  
**INSERVICE INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
32	<p>Apply requirements of Code Case N-722 as modified below:</p> <p>All licensees of pressurized water reactors shall augment their inservice inspection program by implementing ASME Code Case N-722 subject to the conditions specified in paragraphs (g)(6)(ii)(E)(2) through (4) of 10 CFR 50.55a. The inspection requirements of ASME Code Case N-722 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement.</p> <p>If a visual examination determines that leakage is occurring from a specific item listed in Table 1 of ASME Code Case N-722 that is not exempted by the ASME Code, Section XI, IWB-1220(b)(1), additional actions must be performed to characterize the location, orientation, and length of crack(s) in Alloy 600 nozzle wrought material and location, orientation, and length of crack(s) in Alloy 82/182 butt welds. Alternatively, licensees may replace the Alloy 600/82/182 materials in all the components under the item number of the leaking component.</p> <p>If the actions in paragraph 10 CFR 50.55a(g)(6)(ii)(E)(2) determine that a flaw is circumferentially oriented and potentially a result of primary water stress corrosion cracking, licensees shall perform non-visual NDE inspections of components that fall under that ASME Code Case N-722 item number. The number of components inspected must equal or exceed the number of components found to be leaking under that item number. If circumferential cracking is identified in the sample, non-visual NDE must be performed in the remaining components under that item number.</p> <p>If ultrasonic examinations of butt welds are used to meet the NDE requirements in paragraphs (g)(6)(ii)(E)(2) or (g)(6)(ii)(E)(3) of 10 CFR 50.55a, they must be performed using the appropriate supplement of Section XI, Appendix VIII of the ASME Boiler and Pressure Vessel Code.</p>

**7.2 Snubber Inspection Summary Tables**

10 CFR 50.55a "Codes and Standards" allows usage of ASME O&M Code Subsection ISTD in place of ASME Section XI Paragraph IWF-5200(a) and IWF-5300(a) and (b), using VT-3 visual examination methods described in Paragraph IWA-2213.

The following Tables 7.2-1 and 7.2-2 provide a summary of the ASME O&M Code, Subsection ISTD, Snubber visual examinations and functional testing for the Third ISI Interval at Braidwood Station Units 1, 2, and 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	Relief Request/ TAP Number	Notes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(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 Braidwood Station are identified.

(2) O&M Article Number:

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

(3) Article Number Description:

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

(4) Examination Requirements:

Provides the visual examination and functional testing methods 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 visual examinations and functional testing as addressed in ISTD and approved ISTD Code Cases.

(7) Relief Request/Technical Approach & Position Number:

Provides a listing of Relief Request/TAP Numbers to specific snubber components. Relief requests and TAP Numbers that generically apply to all components, or an entire class are not listed. If a Relief Request/TAP Number is identified, see the corresponding relief request in Section 8.0 or the TAP Number in Section 2.5.

(8) 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 in Table 7.2-3.

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**TABLE 7.2-1 - UNIT 1 & COMMON  
SNUBBER INSPECTION SUMMARY TABLE**

<b>ASME O&amp;M Code Subsection</b>	<b>O&amp;M Article Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Totals</b>	<b>Frequency</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
ISTD Snubber Examinations	ISTD-4200	Accessible and Inaccessible Snubbers (1 population)	Visual, VT-3	335	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	103	Every Outage		2
		10% Functional Test Plan - Type 2 Snubbers (PSA-1, PSA-3, PSA-10)	Functional Testing	211	Every Outage		2
		10% Functional Test Plan - Type 3 Snubbers (PSA-35, PSA-100)	Functional Testing	13	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	None	Every Outage		

**ISI Program Plan  
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**TABLE 7.2-2 - UNIT 2  
SNUBBER INSPECTION SUMMARY TABLE**

<b>ASME O&amp;M Code Subsection</b>	<b>O&amp;M Article Number</b>	<b>Description</b>	<b>Exam Requirements</b>	<b>Totals</b>	<b>Frequency</b>	<b>Relief Request/ TAP Number</b>	<b>Notes</b>
ISTD Snubber Examinations	ISTD-4200	Accessible and Inaccessible Snubbers (1 population)	Visual, VT-3	411	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	106	Every Outage		2
		10% Functional Test Plan - Type 2 Snubbers (PSA-1, PSA-3, PSA-10)	Functional Testing	270	Every Outage		2
		10% Functional Test Plan - Type 3 Snubbers (PSA-35, PSA-100)	Functional Testing	27	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	None	Every Outage		

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**TABLE 7.2-3**  
**SNUBBER INSPECTION SUMMARY TABLE PROGRAM NOTES**

<b>Note #</b>	<b>Note Summary</b>
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 Braidwood 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 Braidwood Station relief requests is included in Table 8.0-1. The "13R-XX" relief requests are applicable to ISI, CISI, SPT, and PDI.

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

**TABLE 8.0-1  
RELIEF REQUEST INDEX**

Relief Request	Revision Date <sup>3</sup>	Status <sup>2</sup>	(Program) Description/ Approval Summary <sup>1</sup>
I3R-01	1 11/5/08	Submitted/ Withdrawn/ Resubmitted	Alternate Risk-Informed Selection and Examination Criteria for Examination Category B-F, B-J, C-F-1, and C-F-2 Pressure Retaining Piping Welds. <b>Revision 0 Submitted, Withdrawn until RG 1.200 review was completed, resubmitted as Revision 1 under Letter RS-08-160.</b>
I3R-02	Reserved for Future Submittal		
I3R-03	Reserved for Future Submittal		
I3R-04	0 12/2/08	Submitted	Alternate Requirements from 10 CFR 50.55a(g)(6)(ii)(E) Reactor Coolant Pressure Boundary Examination Scheduling Requirements. <b>Revision 0 Submitted under Letter RS-09-019.</b>

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 an NRC SER which imposes certain conditions; Granted Conditionally - Approved for use in an NRC SER which imposes certain conditions; Denied - Use denied in an 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; 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, which is listed in the fifth column of the table. The date noted in the third column is the date of the ISI Program Plan revision when the relief request was incorporated into the document.

## 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.
- 2) ASME Boiler and Pressure Vessel Code, Section XI, Division 1, "Inservice Inspection of Nuclear Power Plant Components".  
1974 Edition through the Summer 1975 Addenda.  
1983 Edition through the Summer 1983 Addenda.  
1989 Edition, No Addenda.  
1992 Edition through the 1992 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", the 1989 Edition, No Addenda.
- 4) ASME O&M Code, "Code For Operation and Maintenance of Nuclear Power Plants," 2001 Edition through the 2003 Addenda.
- 5) Regulatory Guide 1.14, Revision 1, Reactor Coolant Pump Flywheel Integrity, as Modified by the Requirements of Braidwood License Amendment 118.
- 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 1.137, Revision 1, "Fuel-Oil Systems for Standby Diesel Generators".
- 8) Regulatory Guide 1.147, "Inservice Inspection Code Case Applicability, ASME Section XI, Division 1".
- 9) Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME O&M Code".
- 10) 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.

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- 11) Braidwood Station Units 1 and 2 Updated Final Safety Analysis Report (UFSAR).
- 12) Braidwood Station Technical Specifications, Limiting Conditions for Operation and Surveillance Requirements.
- 13) Braidwood Station Technical Specifications, Bases.
- 14) Braidwood Station Technical Requirements Manual.
- 15) NRC NUREG-0737, dated November 1980, "Clarification of TMI Action Plan Requirements".
- 16) Braidwood Procedures BwVS 290-1, "Visual Examination (Leakage Test) of Potentially Radioactive Components Outside Containment".
- 17) BwVS 290-2-GW, "Gaseous Leak Testing of the Waste Gas System".
- 18) BwVS 290-2-OG, "Gaseous Leak Testing of the Hydrogen Recombiner System".
- 19) ER-AA-330, "Conduct of Inservice Inspection Activities".
- 20) ER-AA-330-001, "Section XI Pressure Testing".
- 21) ER-AA-330-002, "Inservice Inspection of Welds and Components".
- 22) ER-AA-330-003, "Visual Examination of Section XI Component Supports".
- 23) ER-AA-330-004, "Visual Examination of Snubbers".
- 24) ER-AA-330-005, "Visual Examination of Section XI Class CC Concrete Containment Structures".
- 25) ER-AA-330-006, "Inservice Inspection and Testing of the Pre Stressed Concrete Containment Post Tensioning Systems".
- 26) ER-AA-330-007, "Visual Examination of Section XI Class MC and CC Liners".
- 27) ER-AA-330-009, "ASME Section XI Repair/Replacement Program".
- 28) ER-AA-330-010, "Snubber Functional Testing".
- 29) ER-AA-330-011, "Snubber Service Life Monitoring Program".
- 30) Braidwood Station Units 1 and 2 ISI Classification Basis Document, Third Ten-Year Inspection Interval.



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- 31) Braidwood Station Units 1 and 2 Selection Document, Third Ten-Year Inspection Interval.
- 32) Branch Technical Position MEB 3-1, dated November 24, 1975, "High Energy Fluid Systems, Protection Against Postulated Piping Failures in Fluid Systems Outside Containment".
- 33) MRP-139, EPRI Materials Reliability Program, "Primary System Piping Butt Weld Inspection and Evaluation Guideline," dated July 14, 2005.
- 34) EPRI Topical Report TR-112657, Rev. B-A, Final Report, "Revised Risk-Informed Inservice Inspection Evaluation Procedure", December 1999.
- 35) 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.
- 36) Exelon Risk-Informed Inservice Inspection Evaluation (Final Report) for Braidwood Units 1 and 2.
- 37) 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.
- 38) 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.
- 39) Calculation to Determine 80% of Primary Containment "IWE/MC Surface Area" Remains Accessible for Examination, BRW-98-0531-M, for Braidwood Station, Units 1 and 2.