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

Serial No. 11-603 LIC/JG/R0 Docket No.: 50-305 License No.: DPR-43

DOMINION ENERGY KEWAUNEE, INC. KEWAUNEE POWER STATION REACTOR VESSEL INTERNALS INSPECTION PLAN REVIEW REQUEST

Pursuant to the provisions of Renewed Operating License DPR-43, Dominion Energy Kewaunee, Inc. (DEK) hereby requests NRC approval of the attached inspection plan for reactor vessel internal (RVI) components at Kewaunee Power Station (KPS).

Renewed Operating License DPR-43, Section 2.C(15)(b), requires that certain activities be completed in accordance with Appendix A of NUREG-1958, "Safety Evaluation Report Related to the Kewaunee Power Station," dated January 2011. These activities are described in the KPS Updated Safety Analysis Report (USAR), Chapter 15, Table 15.7-1, "License Renewal Commitments." Items 1 and 2 of the required activities (commitments) are as follows:

- The ASME Code Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program will be enhanced to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the staff for review and approval to augment the current inspections.
- 2. The ASME Code Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program will be enhanced to include identification of the limiting susceptible cast austenitic stainless steel (CASS) reactor vessel internal components from the standpoint of thermal aging susceptibility, neutron fluence, and cracking. For each identified component, a plan will be developed that accomplishes aging management through either a supplemental examination or a component-specific evaluation. The plan will be submitted for staff review and approval, not less than 24 months before entering the period of extended operation.

The attachment to this letter transmits the proposed inspection plan as required by the above commitments. DEK requests review and approval of the proposed inspection

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plan by October 2012. DEK plans to perform the proposed inspections over the course of the next three refueling outages, commencing with the spring 2012 refueling outage.

Commitment 1 above is based on EPRI Materials Reliability Program (MRP) Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines." Subsequent to the creation of Commitment 1, the NRC staff issued their final Safety Evaluation (SE) for MRP-227. In conjunction with this SE, the NRC also issued Regulatory Issue Summary (RIS) 2011-07, "License Renewal Submittal Information for Pressurized Water Reactor Internals Aging Management," to provide information on acceptable changes to existing license renewal commitments in order to allow licensees to submit their RVI inspection plan based on the guidance for the forthcoming version of MRP-227 approved by the staff's SE (MRP-227-A). This RIS stated that licensees such as DEK may modify their commitments to submit their RVI inspection plan no later than October 1, 2012.

However, KPS License Condition 2.C(15)(b) requires that DEK submit the RVI inspection plan in accordance with Appendix A of NUREG-1958, which would necessitate a submittal date no later than December 21, 2011.

Therefore, DEK is submitting the attached inspection plan in accordance with the KPS license condition. In order to meet the intent of RIS 2011-07, the attached inspection plan incorporates information based on the NRC staff's SE of MRP-227, using the most recent information available prior to the date of this letter.

If you have questions or require additional information, please contact Mr. Jack Gadzala at 920-388-8604.

Very truly yours,

Price e President – Nuclear Engineering

Attachment:

1. Kewaunee Power Station Inspection Plan for the Augmented Inservice Inspection Program for Examination of Reactor Vessel Internals

Commitments made by this letter: No new commitments are made. This letter fulfills Items 1 and 2 (USAR Chapter 15, Table 15.7-1, License Renewal Commitments) to submit an inspection plan for reactor internals (including CASS components) to the staff for review and approval to augment the current inspections.

cc: Regional Administrator, Region III U. S. Nuclear Regulatory Commission 2443 Warrenville Road Suite 210 Lisle, IL 60532-4352

> Mr. Karl D. Feintuch Project Manager U.S. Nuclear Regulatory Commission One White Flint North, Mail Stop O8-H4A 11555 Rockville Pike Rockville, MD 20852-2738

NRC Senior Resident Inspector Kewaunee Power Station

Serial No. 11-603

ATTACHMENT 1

KEWAUNEE POWER STATION REACTOR VESSEL INTERNALS INSPECTION PLAN REVIEW REQUEST

INSPECTION PLAN FOR THE AUGMENTED INSERVICE INSPECTION PROGRAM FOR EXAMINATION OF REACTOR VESSEL INTERNALS

KEWAUNEE POWER STATION DOMINION ENERGY KEWAUNEE, INC.

INSPECTION PLAN FOR THE AUGMENTED INSERVICE INSPECTION PROGRAM FOR EXAMINATION OF REACTOR VESSEL INTERNALS

INTRODUCTION

The American Society of Mechanical Engineers (ASME) Code Section XI Inservice Inspection (ISI) (Reference 1), Subsections IWB, IWC, and IWD program is described in the KPS Updated Safety Analysis Report (USAR) Section 15.3.2, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD." As stated in the USAR, this program corresponds to NUREG-1801, Section XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD." Program details are contained in Technical Report KLR-1309, "License Renewal Project, Aging Management Program, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD."

Enhancements to the ASME Section XI ISI, Subsections IWB, IWC, and IWD program for managing aging effects on reactor internals and on limiting susceptible cast austenitic stainless steel (CASS) reactor vessel internals components are detailed in Technical Report KLR-1309A, "License Renewal Project, Aging Management Program, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, Reactor Vessel Internals Inspections." These enhancements are being made in accordance with two license renewal commitments described in the KPS Updated Safety Analysis Report (USAR), Chapter 15, Table 15.7-1, "License Renewal Commitments" (Commitments 1 and 2). These two commitments are as follows:

- The ASME Code Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program will be enhanced to: (1) participate in the industry programs for investigating and managing aging effects on reactor internals; (2) evaluate and implement the results of the industry programs as applicable to the reactor internals; and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the staff for review and approval to augment the current inspections.
- 2. The ASME Code Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program will be enhanced to include identification of the limiting susceptible cast austenitic stainless steel (CASS) reactor vessel internal components from the standpoint of thermal aging susceptibility, neutron fluence, and cracking. For each identified component, a plan will be developed that accomplishes aging management through either a supplemental examination or a component-specific evaluation. The plan will be submitted for staff review and approval, not less than 24 months before entering the period of extended operation.

Augmented examinations are those examinations that are performed outside the scope of the requirements of ASME Boiler and Pressure Vessel Code Section XI (and are

instead governed by the USAR and Technical Specifications) or that are required to be performed by ASME/ANSI OM Standard Part 4 (as referenced in ASME Boiler and Pressure Vessel Code Section XI).

The Augmented ISI Program inspection plan for examination of reactor vessel internals is organized into four (4) groups of tables for examinations as primary components, expansion components, existing programs, and cast austenitic stainless steel (CASS) components.

The four program groups are defined as follows (The first three groups are associated with Commitment 1. The fourth group is associated with Commitment 2).

- Group 1 Primary Components provides a listing of items to be inspected consistent with Table 4-3, "Westinghouse Plants Primary Components (MRP-227-Rev-0)." This group has been supplemented to include TRC-2 from the NRC SER dated June 22, 2011.
- Group 2 Expansion Components provides a listing of items to be inspected if degradation is verified from group 1 inspections consistent with Table 4-6, "Westinghouse Plants Expansion Components (MRP-227-Rev 0)," and Table 5-3, "Westinghouse Plants Examination Acceptance and Expansion Criteria." This group has been supplemented to include TRC-1 from the NRC SER dated June 22, 2011.
- Group 3 Existing Programs provides a listing, for information only, of items historically inspected consistent with Table 4-9, "Westinghouse Plants Existing Programs Components."
- Group 4 Reactor vessel internal components fabricated from cast austenitic stainless steel (CASS). Each of these CASS components has been reviewed by Westinghouse Electric Company to determine whether they should be classified as primary, expansion, existing, or no additional measures.

Commitment 1 requires augmented inspections associated with the first three groups, which are based on the guidance in EPRI Materials Reliability Program (MRP) Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines." Applicable acceptance criteria for the MRP-227 inspections are provided in WCAP-17096 (Reference 3), WCAP-15425 (Reference 4), and WCAP-17020-P (Reference 5). In developing the inspection plan for the first three groups, DEK used the information provided in the NRC staff's final Safety Evaluation (SE) of MRP-227, dated June 22, 2011. A summary of the applicability of each topical report condition and licensee action item discussed in the SE to the KPS reactor vessel internal components is provided in the program description below.

Commitment 2 requires augmented inspections associated with the fourth group, CASS components. Guidance for the associated inspections of the fourth group is taken from NUREG-1801, XI.M13, Inspection Plan Cast Austenitic Stainless Steel (CASS) Reactor Vessel Internal Components (Reference 2).

This attachment submits the plan, contained in Tables 1 through 4 below, for conducting augmented ISI Program inspections of reactor vessel internal components, organized into the four groupings discussed above. These inspections are planned to start during the fourth inspection interval (June 2004 – June 2014).

INSPECTION PROGRAM DESCRIPTION – GROUPS 1, 2, AND 3

The Augmented ISI Program for examination of reactor vessel internals associated with primary components, expansion components, and existing programs (Groups 1, 2, and 3) is based on EPRI Materials Reliability Program (MRP) Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines" (Reference 9). Subsequent to the creation of Commitment 1, the NRC staff issued their final Safety Evaluation (SE) of MRP-227 (Reference 10). In conjunction with this SE, the NRC also issued Regulatory Issue Summary (RIS) 2011-07, "License Renewal Submittal Information for Pressurized Water Reactor Internals Aging Management," to provide information on acceptable changes to existing license renewal commitments in order to allow licensees to submit their RVI inspection plan based on the guidance of the forthcoming version of MRP-227 approved by the staff's SE (MRP-227-A). This RIS stated that licensees such as DEK may modify their commitments to submit their RVI inspection plan no later than October 1, 2012.

However, KPS License Condition 2.C(15)(b) requires that DEK submit the RVI inspection plan in accordance with Appendix A of NUREG-1958, which would necessitate a submittal date no later than December 21, 2011.

Therefore, DEK is submitting this inspection plan in accordance with the license condition. In order to meet the intent of RIS 2011-07, the inspection plan incorporates information based on MRP-227, Revision 0, as augmented by the NRC staff's SE for MRP-227, using the most recent information available prior to the date of this letter.

Conformance of MRP-227 Inspection Plan to NRC SE

The NRC staff issued their final SE for MRP-227 on June 22, 2011 (Reference 10). The SE contains seven (7) topical report conditions (TRC) and eight (8) licensee action items (LAI). As discussed in RIS 2011-07, these TRCs and LAIs are to be incorporated into the approved version of MRP-227, designated MRP-227-A. However, MRP-227-A may not be published prior to the date that DEK is required to submit the RVI inspection plan specified in KPS License Condition 2.C(15)(b). Therefore, to meet the intent of

RIS 2011-07, the TRCs and LAIs in the SE were reviewed and incorporated, as applicable, into the proposed inspection plan.

This section provides a summary of the applicability of each TRC and LAI discussed in the SE, as it relates to the KPS reactor vessel internal components (applicable only to Groups 1 through 3).

TRC-1

When a surface breaking flaw is confirmed by EVT-1 on the upper core barrel flange welds or control rod guide tube flange welds, then expansion of the EVT-1 examination is required to the lower support forging and upper core plate. The expansion examinations are to be completed by the end of the next refueling outage (following flaw confirmation). TRC-1 is applicable to KPS.

TRC-2

Add EVT-1 examination of the core barrel girth welds as a Primary item. There are a total of four (4) circumferential welds in the KPS core barrel: the upper core barrel flange weld (Primary), Core Barrel Mid Plane Weld (NRC SER), Core Barrel Lower Mid Plane Weld (NRC SER), and Core Barrel Lower Bottom Weld. Therefore, EVT-1 examination of the Core Barrel Mid Plane Weld and Core Barrel Lower Mid Plane Weld is required no later than two refueling outages from the beginning of the license renewal period and subsequent examination on a ten-year interval. The examination volume is 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. TRC-2 is applicable to KPS.

TRC-3

TRC-3 pertains to the Support Column Welds of Combustion Engineering Plants and is not applicable to KPS.

TRC-4

This item relates to the minimum coverage that applies to examination of expansion items. Per NRC SER the minimum examination coverage applicable to examination of expansion items at KPS will be 75%. TRC-4 is applicable to KPS.

TRC-5

This item deals with the required re-inspection frequency for ultrasonic examination of the baffle bolts. MRP-227, Revision 0 proposes that re-inspection would occur on a 10 to 15 EFPY frequency. However, the NRC SER requires that ultrasonic inspection be performed on a 10-year frequency. TRC-5 is applicable to KPS.

TRC-6

This item deals with how often re-inspections will occur to expansion items once they are initially performed because the acceptance criteria of the Primary component requires expansion to another component. Per the NRC SER the re-inspection frequency is 10 years for the expansion items. TRC-6 is applicable to KPS.

TRC-7

This item deals with the 10 programmatic elements identified in the GALL document. The existing KPS Aging Management Program (AMP) for the reactor vessel internals, KLR-1309A, identifies the 10 programmatic elements listed in GALL Revision 1. These program elements remain the same as the program elements included in Appendix A of MRP-227, Revision 0 and Appendix A of NUREG-1800, Revision 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." Therefore, no change is required by TRC-7 since the existing KPS AMP contains the same 10 programmatic elements. At KPS, the program scope will be consistent with these program elements as implemented by Procedure ER-AA-AMP-1003, "Aging Management Programs for License Renewal Structures, Systems, and Components."

LAI-1

This item deals with the functionality analyses and supporting aging management strategies in MRP-232. Section 2.4 of MRP-227 requires that the following assumptions be validated for each Westinghouse reactor:

- 30 years of operation with high leakage core loading patterns (fresh fuel assemblies loaded in peripheral locations) followed by implementation of a low-leakage fuel management strategy for the remaining 30 years of operation;
- Base load operation, i.e., typically operates at fixed power levels and does not usually vary power on a calendar or load demand schedule; and
- No design changes beyond those identified in general industry guidance or recommended by the original vendors.

KPS has validated that these assumptions are applicable, as referenced in KLR-1309A.

LAI-2

This item deals with ensuring that the reactor internals components have been considered in the scope of license renewal. KPS contracted Westinghouse Electric Company to review the KPS reactor vessel internals. As part of the review process Westinghouse Electric Company reviewed and classified each of the internals as Primary, Expansion, Existing, or No Additional Measures. Therefore, each of the reactor vessel internals components have been classified into the appropriate aging management group based upon industry recommendations outlined in MRP-227. This item is complete for KPS.

LAI-3

This item deals with management of the Westinghouse guide tube support pins (split pins). Originally, the split pins at KPS were fabricated from type X-750 inconel. Some of the original type X-750 inconel split pins at other Westinghouse sites failed as a result of higher than desired stresses in the head to shank region and heat treatment that was not fully optimized. The split pins at KPS were replaced in 2004 with type 316 stainless steel. Replacement with type 316 stainless steel split pins is expected to resolve the cracking issue observed in the type X-750 inconel split pins seen at other sites. The KPS type 316 split pins will only have been in service approximately 29 years through the end of the license renewal period (2033). Therefore, this item is complete for KPS.

LAI-4

This item deals with B&W Core Support Structure Upper Flange Stress Relief. This item is not applicable to KPS.

LAI-5

This item deals with physical measurement of the Westinghouse hold-down springs fabricated from type 304 stainless steel. The hold-down springs at KPS are fabricated from type 403 stainless steel materials. Type 403 stainless steel is not subject to the aging mechanism of concern. This item is not applicable to KPS.

LAI-6

This item deals with evaluation of inaccessible B&W components. The KPS reactor internals are designed by Westinghouse Electric Company. Therefore, LAI-6 does not apply to KPS.

LAI-7

This item deals with the need for a plant-specific evaluation of CASS materials for the Westinghouse lower support column bodies. At KPS, the lower support column bodies are not fabricated from CASS. Therefore, LAI-7 does not apply to KPS.

LAI-8

This item deals with the need for submittal of information for NRC review and approval. Commitment 1 in the Updated Safety Analysis Report (USAR), Chapter 15, Table 15.7-1, "License Renewal Comments," indicates that KPS will submit an inspection plan for the reactor internals to the NRC staff for review and approval to augment the current inspections not less than 24 months before entering the period of extended operation. LAI-8 applies to KPS.

INSPECTION PROGRAM DESCRIPTION – CASS COMPONENTS (GROUP 4)

Reactor vessel internals are visually inspected in accordance with ASME Code Section XI, Subsection IWB, Category B-N-3. This inspection is augmented to detect the effects of loss of fracture toughness due to thermal aging and neutron irradiation embrittlement of CASS reactor vessel internals. This CASS reactor vessel internals inspection program includes the following two aspects.

- 1. Identification of susceptible components determined to be limiting from the standpoint of thermal aging susceptibility (i.e., ferrite and molybdenum contents, casting process, and operating temperature) and/or neutron irradiation embrittlement (neutron fluence); and,
- 2. For each "potentially susceptible" component, aging management is accomplished through either a supplemental examination of the affected component based on the neutron fluence to which the component has been exposed as part of the 10year ISI program during the license renewal term, or a component-specific evaluation to determine its susceptibility to loss of fracture toughness.

CASS components in the KPS reactor vessel internals include:

- Upper Internals Mixing Devices [CF8]
- Upper Instrumentation Conduit Supports [CF8]
- Upper Instrumentation Clamps [CF8]
- Upper Support Column Bases [CF8]
- Upper Support Thermocouple Stops [CF8]
- BMI Column Cruciforms [CF8]

The program provides screening criteria to determine the susceptibility of CASS components to thermal aging on the basis of casting method, molybdenum content, and percent ferrite. The screening criteria are applicable to primary pressure boundary and reactor vessel internal components constructed from SA- 351 Grades CF3, CF3A, CF8, CF8A, CF3M, CF3MA, CF8M, with service conditions above 250°C (482°F). The screening criteria for susceptibility to thermal aging embrittlement are not applicable to niobium-containing steels; such steels require evaluation on a case-by-case basis. For "potentially susceptible" components, the program provides for the consideration of the synergistic loss of fracture toughness due to neutron embrittlement and thermal aging embrittlement. For each such component as part of a 10-year ISI program during the license renewal term; or, (b) a component specific evaluation to determine the component's susceptibility to loss of fracture toughness.

Based on the criteria set forth in the May 19, 2000 letter from Christopher Grimes (NRC) to Douglas Walters (NEI) (Reference 6), the susceptibility to thermal aging embrittlement of CASS components is determined in terms of casting method,

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molybdenum content, and ferrite content. For low-molybdenum content steel (0.5 wt.% max.), only static-cast steel with > 20% ferrite is potentially susceptible to thermal embrittlement. Static-cast low-molybdenum steel with \leq 20% ferrite and centrifugal-cast low-molybdenum steel is not susceptible. High-molybdenum content (2.0 to 3.0 wt.%) steel, static-cast steel with > 14% ferrite, and centrifugal-cast steel with > 20% ferrite are potentially susceptible to thermal embrittlement. Static-cast high-molybdenum steel with > 20% ferrite are potentially susceptible to thermal embrittlement. Static-cast high-molybdenum steel with \leq 20% ferrite are not susceptible. In the susceptibility screening method, ferrite content is calculated by using the Hull's equivalent factors (described in NUREG/CR-4513, Revision 1) (Reference 7).

The program specifics depend on the neutron fluence and thermal embrittlement susceptibility of the component. Each of the CASS items has been classified by Westinghouse Electric Company as "No Additional Measures" per the guidance in MRP-227 and MRP-232. EPRI MRP-175, "Materials Reliability Program: PWR Internals Material Aging Degradation Mechanism Screening and Threshold Values – EPRI Report 1012081," 2005, indicates the neutron fluence threshold for CASS as greater than 10^{20} n/cm² (E>1 MeV) (Reference 8). For CASS items classified as "No Additional Measures," the inspection program monitors the effects of loss of fracture toughness on the intended function of the component by identifying the CASS materials that have a neutron fluence of greater than 10^{20} n/cm² (E>1 MeV) and are determined to be susceptible to thermal aging embrittlement. For such materials, the program consists of either supplemental examination of the affected component based on the neutron fluence to which the component has been exposed, or component-specific evaluation to determine the component's susceptibility to loss of fracture toughness.

For reactor vessel internal CASS components classified as "No Additional Measures" that have a neutron fluence of greater than 10²⁰ n/cm² (E>1 MeV) and are determined to be susceptible to thermal embrittlement, the 10-year ISI program during the renewal period includes a supplemental inspection covering portions of the susceptible components determined to be limiting from the standpoint of thermal aging susceptibility (i.e., ferrite and molybdenum contents, casting process, and operating temperature), neutron fluence, and cracking susceptibility (i.e., applied stress, operating temperature, and environmental conditions). One example of a supplemental examination is enhancement of the visual VT-1 examination of Section XI IWA-2210. A description of such an enhanced visual VT-1 examination could include the ability to achieve a 0.0005-inch resolution, with the conditions (e.g., lighting and surface cleanliness) of the inservice examination bounded by those used to demonstrate the resolution of the inspection technique. Another example of a supplemental examination is an EVT-1 visual examination. An enhanced visual (EVT-1) examination has the same requirements as the ASME Code Section XI visual (VT-1) examination, with additional requirements given in MRP-228, "Materials Reliability Program: Inspection Standard for PWR Internals." The inspection schedule for CASS items at KPS is provided in Table 1.

Alternatively, in lieu of performing a supplemental enhanced visual examination, DEK may perform a component-specific evaluation, including a mechanical loading

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assessment to determine the maximum tensile loading on the component during ASME Code Level A, B, C, and D conditions. If the loading is compressive or low enough (< 5 ksi) to preclude fracture, then supplemental inspection of the component is not required. Failure to meet this criterion requires continued use of the supplemental inspection program. For each CASS component that has been subjected to a neutron fluence greater than 10²⁰ n/cm² (E>1 MeV) and is potentially susceptible to thermal aging, the supplemental inspection program applies; otherwise, the existing ASME Section XI inspection requirements are adequate if the components are not susceptible to thermal aging embrittlement.

An enhanced visual inspection will not be required for KPS reactor internal CASS items that are shown to have either a neutron fluence less that 10^{20} n/cm² (E>1 MeV); delta ferrite less than 20%; or, loading in compression or low enough (< 5 ksi) to preclude fracture. Accessible surfaces of CASS items that screen out as not susceptible will continue to be inspected to the extent possible using a VT-3 method if required by ASME Section XI, Subsection IWB, Categories B-N-1, B-N-2, and B-N-3.

Extent of Examination

A supplemental enhanced visual examination is performed on accessible surfaces of CASS items that have a neutron fluence greater than 10^{20} n/cm² (E>1 MeV) and delta ferrite greater than 20% and tensile loading (> 5 ksi).

Relevant Conditions

While an enhanced inspection technique will be used for detection of relevant conditions, the inspection results will be assessed using ASME Section XI. Any of the following relevant conditions shall be unacceptable for continued service unless the requirements of ASME Section XI, IWB – 3142 are met.

- Structural distortion or displacement of parts to the extent that component function may be impaired.
- Loose, missing, cracked, or fractured parts, bolting, or fasteners.
- Foreign materials or accumulation of corrosion products that could interfere with control rod motion or could result in blockage of coolant flow through fuel.
- Corrosion or erosion that reduces the nominal section thickness by more than 5%.
- Wear of mating surfaces that may lead to loss of function.
- Structural degradation of interior attachments such that the original cross-sectional area is reduced by more than 5%.

If relevant conditions are found during the enhanced visual inspections, ASME Section XI, IWB-3142 states that the affected components cannot be returned to service until deemed acceptable per code requirements.

REFERENCES

- 1. ASME Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, ASME Boiler and Pressure Vessel Code, 1998 edition including the 2000 Addenda.
- 2. NUREG 1801, Volume 2, Revision 1, Chapter XI.M13.
- 3. WCAP-17096, "Reactor Internals Acceptance Criteria Methodology and Data Requirements," Revision 0, July 2009.
- 4. WCAP-15425, "Determination of Acceptable Baffle-Barrel-Bolting for Kewaunee and Prairie Island Plants," Revision 0, May 2001.
- 5. WCAP-17020-P, "Point Beach Unit 1 Upper Internal Guide Tube Guide Card Wear Evaluation," Revision 0, September 2009.
- 6. Letter from Christopher I. Grimes (NRC) to Douglas J. Walters (NEI), "License Renewal Issue No. 98-0030, *Thermal Aging Embrittlement of Cast Stainless Steel Components*," May 19, 2000. (ADAMS Accession No. ML003717179)
- 7. NUREG/CR-4513, "Estimation of Fracture Toughness of Cast Stainless Steels during Thermal Aging in LWR Systems," Revision 1, August 1994.
- 8. Materials Reliability Program: PWR Internals Material Aging Degradation Mechanism Screening and Threshold Values (MRP-175) EPRI Report 1012081, 2005.
- 9. EPRI Report 1016596, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines (MRP-227-Rev. 0)," December 2008.
- 10. Final Safety Evaluation (SE) of EPRI Report, Materials Reliability Program Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines," dated June 22, 2011.

Table 1

Reactor Vessel Internals Inspection Plan

MRP-227

Westinghouse Plants Primary Components

(14 pages)

KEWAUNEE POWER STATION DOMINION ENERGY KEWAUNEE, INC.

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	TABLE 1 KEWAUNEE POWER STATION														
			FOURTH	IEWAL AND F	INEE IFTH	POW INTÉ	ER S RVAI	TAT . ISI	ION SCHE	EDULI	E				
Examination	Category: <u>MRP-227</u>	Description: <u>TABLE</u>	4-3 WESTINGHOL	USE PLA	NTS P	RIMAR	Y CO	MPO	NENTS	CONT	ROL RO	D DRIV	<u>E TUBES (CRG</u>	T) GUIDE PLATE CARDS	
ltem No.	Parts Examined	ISI Drawing No	Equipment No.	INT.	E Sch	xamin 1	ation. 2	Peric 3	d EOI	Ex Vol	aminat Vethod Sur	ion s Vis	Exemption, Code Case, or Relief Request	Comments	
	Reactor Vessel Internals														
CRGT	Guide Plate Cards	Attachment Figure 2	Position 2F		N			•				×		Visual (VT-3) examination no later than 2 refueling outages from the beginning of the license renewal period, and no earlier than two refueling outages prior to the start of the license renewal period. 20% examination of the number of CRGT assemblies, with all guide cards within each selected CRGT assembly examined. A total of 29 locations. It is suggested that the population selected for initial inspection coincide with the inlet nozzle locations.	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 2H		N			_				. x	1	Same as above	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 3E		N							x		Same as above	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 3G		N							x		Same as above	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 3I		Y							x		Same as above	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 4D		N							х		Same as above	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 4J		Y							x		Same as above	

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Examination	Category: <u>MRP-227</u>	Description: <u>TABLE</u>	4-3 WESTINGHO	<u>JSE PLA</u>	<u>NTS P</u>	RIMAR	<u> </u>	MPO	NENTS	CONTI	ROL RO	D DRIV	E TUBES (CRG	T) GUIDE PLATE CARDS
Item No.	Parts Examined	ISI Drawing No.	Equipment No.	İNT.	E Sch	xamin	ation	Peric 3	d EÖl	Ex Vol	aminat Method Sur	ion s Vis	Exemption, Code Case, or Relief	Comments
CRGT	Guide Plate Cards	Attachment Figure 2	Position 5C		N			940			1997 - A. 1 1997 - A. 1997 - A. 19 1997 - A. 1997 - A. 19	x	in the second	Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 5E		N					<u> </u>		x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 5G		N							×		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 5I		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 5K		Y							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 6B		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 6F		N		-			-		x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 6H		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 6L		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 7C		N		i					x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 7E		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 7G		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 7I		N							x		Same as above

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· · · · ·			K Fourth	ewau And F	T,A INEE IFTH	NBLE POW INTE	1 ER S RVAI	TAT ISI	ION SCHE	EDULI				
Examination	Category: <u>MRP-227</u>	Description: <u>TABLE</u>	4-3 WESTINGHO	JSE PLA	NTS P	<u>Rim'ar</u>	N CO	MPO	NENTS	CONT	ROL RC	D DRIV	<u>E-TUBES (CRG</u>	T) GUIDE PLATE CARDS
Item No.	Parts Examined	ISI Drawing No.	Equipment No	INT	E E	xamin	ation	Perio	d .	EX.	aminat Nethod	ion s	Exemption, Code Case,	Comments
					Sch	1	2	3	ÊÔI	Vol	Sur	Vis	or Relief. Request	
CRGT	Guide Plate Cards	Attachment Figure 2	Position 7K		N							×		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 8B		N							×		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 8F		N							×		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 8H		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 8L		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 9C		Y							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 9E		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 9G		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 9I		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 9K		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 10D		Y							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 10J		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 11E		Y							x		Same as above

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			k FOURTH	(EWAU AND F	TA INEE IFTH	NBLE Pow Intei	1 ER S RVAI	TAT - ISI	ion Schi	D ÛLI				
Examination	Examination Category: MRP-227 Description: TABLE 4-3: WESITINGHOUSE: PLANTS: PRIMARY: COMPONENTS: CONTROL-ROD DRIVE TUBES (CRGT) GUIDE PLATE CARDS													
ltem No.	Parts Examined	ISI Drawing No.	Eguipment(No.	INT	E Sch	xamin	ation Mean	Perio	d EOi	Ex Vol	aminat Method Sur	on S Vis	Exemption, Code Case, or Relief Request	Comments
CRGT	Guide Plate Cards	Attachment Figure 2	Position 11G		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 11I		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 12F		N							x		Same as above
CRGT	Guide Plate Cards	Attachment Figure 2	Position 12H		N				_			x		Same as above
<u>Category N</u> 1. End KR	<u>Notes:</u> d of Original License 34 (Spring 2015).	is December 21,	2013. The exam	ination	s may	be pe	rform	ned c	luring	Refue	ling Ou	utages	KR 32 (Spring	g 2012), KR 33 (Fall 2013) or

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			FOURTH	(EWAU AND F	T <i>i</i> Inée Ifth	ABLE POW INTE	1 ER S RVAI		ion Schi	EDUL	E			2
Examination	Category: <u>MRP-227</u>	Description: <u>TABLI</u>	E 4-3 WESTINGHO	USE PL	ANTS.F	<u>PRIMA</u>	<u>RÝ CC</u>	<u>DMBC</u>	<u>INENTS</u>	CONT	ROL RO	<u>OD DRI</u> On	VE TUBES (CRO	<u>ST) LOWER FLANGE WELDS</u>
Item No.	Parts Examined	ISI Drawing No.	Equipment No.	ÎNT.	Sch	xamir 1	ation 2	Peric 3	d EOI	Vol	Method Sur	s Vis	Code Case, or Relief Request	Comments
	Reactor Vessel Internals					- -								
CRGT	Lower Flange Welds	Attachment Figure 4	Position 2F		Y							x		Enhanced visual (EVT-1) examination to determine the presence of crack-like surface flaws in flange welds no later than 2 refueling outages from the beginning of the of the license renewal period and subsequent examination on a ten-year interval. 100% of outer (accessible) CRGT lower flange weld surfaces and adjacent base metal. See Figure 4-21 of MRP- 227. Expansion Link – Bottom- mounted (BMI) column bodies and Lower support column bodies (cast). Expansion Link – Upper Core Plate and Lower Support Forging per NRC SER TRC-1. A total of 37 locations.
CRGT	Lower Flange Welds	Attachment Figure 4	Position 2H		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 3E		Y							X .		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 3G		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 31		Y							x		Same as above

			k FOURTH	(EWAU AND F	TA INEE	ABLE POW INTE	1 ER S RVAI		ION SCHI	EDUL				
Examination	Category: <u>MRP-227</u>	Description: <u>TABLE</u>	4-3 WESTINGHO	USE PL	ANTS P	RIMA	RY CC	DMPC	NENTS	CONT	ROL RO	<u>DD DRIN</u>	/E TUBES (CRC	GT) LOWER FLANGE WELDS
Item No.	Parts Examined	ISI Drawing No.	Equipment No.	INT.	E C	xamir	ation	Peric	d.	ÉX	aminati Method:	on s	Exemption, Code Case,	Comments
					Sch	1	2	3	EOI	Võl	Sūr	Vis	or Relief Request	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 4D		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 4J		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 5C		Y				,			x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 5E		Ņ							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 5G		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 5I		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 5K		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 6B		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 6F		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 6H		N	- - -						x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 6L		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 7C		N							х		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 7E		N							х		Same as above

Serial No. 11-603

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			k EOURTH	(EWAU AND F	T/ INEE IFTH	ABLE POW INTE	1 ER S RVAL	TAT . ISI	ION SCHE	EDULI				
Examination	Category: <u>MRP-227</u> [Description: TABLE	E 4-3 WESTINGHO	<u>USE PL</u>	ANTS F	<u>PRIMA</u>	RY CO	MPO	<u>NENTS</u>	CONT	ROL RO	<u>DD DRI</u>	VE TUBES (CRO	ST) LOWER FLANGE WELDS
Item No	Parts Examined	ISI Drawing No	Faultoment No.	INT	E	xamin	ation	^{>} erio	d	Ex	aminat Method	ion s	Exemption, Code Case,	Comments
Rent NO.		ISI DI AWING NO. 4	Equipment No.		Sch	1	2	3	EOI	Vol	Sur	Vis	or Relief Request	Comments
CRGT	Lower Flange Welds	Attachment Figure 4	Position 7G		N	7						×		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 71		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 7K	-	N						d.	x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 8B		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 8F		N					2		x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 8H		N				~			x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 8L		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 9C		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 9E		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 9G		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 9I		N							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 9K		Y							x		Same as above
CRGT	Lower Flange Welds	Attachment Figure 4	Position 10D		Y							х		Same as above

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			K FOURTH	EWAL	TA INEE IFTH	ABLE POWI INTER	1 ER SI RVAL	ISI	ioņ Sche	DULI					
Examination	Category: <u>MRP-227</u>	Description: <u>TABLE</u>	4-3 WESTINGHO	<u>USE PL</u>	<u>ANTS P</u>	RIMÁF	<u>ừ Cố</u>	<u>NPO</u>	NENTS	CONT	ROL RO	DD DRIV	<u>/E TUBES (CRG</u>	T) LOWER FLANGE WELDS	
	tem No. Parts Examined ISI.Drawing:No. Equipment No. INT Examination Period Examination Code Case, Comments														
Item No.	Parts Examined	ISI.Drawing:No.	Equipment No.	IN I.	Sch		2	3	EOI	Vol	Sur	Vis	or Relief Request	Comments	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 10J		Ŷ							x	•	Same as above	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 11E		Y							x		Same as above	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 11G		N							x		Same as above	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 11I		Y							x		Same as above	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 12F		Y							x		Same as above	
CRGT	Lower Flange Welds	Attachment Figure 4	Position 12H		Y							x		Same as above	

Category Notes:

1. End of Original License is December 21, 2013. The examinations may be performed during Refueling Outages KR 32 (Spring 2012), KR 33 (Fall 2013) or KR 34 (Spring 2015).

2. There are a total of 20 active CRGT's on the periphery.

3. It is anticipated that approximately 180 degrees or half the weld length is accessible on each periphery CRGT.

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Examination	Category: <u>MRP-227</u> ,	Description: <u>TABLI</u> <u>WELD</u>	E4-3 WESTINGHO	USE PL	ANTS P	<u>RIMA</u>	<u>RY CO</u>	<u>MPC</u>	<u>NENTS</u>	CORE	BARR	<u>EL ASS</u>	<u>EMBLY - UPPE</u>	R CORE BARREL FLANGE
lite en Nie					Se E	xamin	ation	Periç	id.	Ex	aminat Vethod	ion s	Exemption, Code Case,	Commonto
	Paris Examined		Equipment No:	INI	Sch	1.	2	3	EOI	Vòi	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel Assembly	Upper Core Barrel Flange Weld	M-1199	Upper Core Barrel Flange to Core Barrel Weld		Y						X³	X ³		Periodic enhanced visual (EVT-1) examination, no later than 2 refueling outages from the beginning of the license renewal period and subsequent examination on a ten-year interval. 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. See Figure 4-22 of MRP- 227. Expansion Link – Core Barrel Outlet Nozzles. Expansion Link – Lower Support Column Bolts per NRC SER TRC-1.
Core Barrel Assembly	NRC SER Core Barrel Girth Welds	M-1199	Core Barrel Mid Plane Weld		Y						X³	X ³		Periodic enhanced visual (EVT-1) examination, no later than 2 refueling outages from the beginning of the license renewal period and subsequent examination on a ten-year interval. 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. No expansion required.

			I EQURTH	(EWAL AND F	T/ JNEE IFTH	NBLE POW	1 ER S RVAL	TAT	ion Sche	EDULE				
Examination	Category: <u>MRP-227</u>	Description: <u>TABL</u> <u>WELC</u>	E 4-3 WESTINGHO	<u>)USE PL</u>	<u>ANTS F</u>	<u>RIMA</u>	<u>RY CO</u>	<u>MPO</u>	<u>NENTS</u>	CORE	BARR	<u>EL ASS</u>	EMBLY - UPPE	R CORE BARREL FLANGE
ltem No.	Parts Examined	ISI Drawing No.	Equipment No.	INT.	E	xamin	ation	Perio	d FO	Ex I Vol	aminat Method	ion s Vis	Exemption, Code Case, or Relief	Comments
Core Barrel Assembly	NRC SER Core Barrel Girth Welds	M-1199	Core Barrel Lower Mid Plane Weld		Y						X³	X ³		Periodic enhanced visual (EVT-1) examination, no later than 2 refueling outages from the beginning of the license renewal period and subsequent examination on a ten-year interval. 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. No expansion required.
Core Barrel Assembly	NRC SER Core Barrel Girth Welds	M-1199	Core Barrel Lower Bottom Weld		N						X ^{3,4}	X ^{3,4}		Periodic enhanced visual (EVT-1) examination, no later than 2 refueling outages from the beginning of the license renewal period and subsequent examination on a ten-year interval. 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. No expansion required.

1. End of Original License is December 21, 2013. The examinations may be performed during Refueling Outages KR33 (Fall 2013) or KR34 (Spring 2015).

2. Reference NRC SER dated June 22, 2011, Final Safety Evaluation of EPRI Report, Materials Reliability Program Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines".

3. Enhanced visual may be satisfied through eddy current examination if elected in lieu of EVT-1.

4. NRC SER TRC-2 does not apply to the Core Barrel Lower Bottom Weld since it is not a flange weld.

5. A minimum of 75% of the total weld length (examined + unexamined), including coverage consistent with the Expansion criteria in Table 5-3, must be examined from either the inner or outer diameter for inspection credit.

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			FOURTH	(EWAU AND F	T <i>4</i> INÉE IFTH	INTE	1. ER:S RVAL	TAT . ISI	ion Schi	EDULI				
Examination C	Examination Category: MRP-227 Description: TABLE 4-3-WESTINGHOUSE PLANTS PRIMARY-COMPONENTS BAFFLE FORMER ASSEMBLY - BAFFLE EDGE BOLTS													
					it in the second secon	xamin	ation	Peric	d	Ex	aminat Nethod	ion s	Exemption,	
Item No.	Parts Examined	ISI Drawing No.	Equipment No:	NT.	Sch		2	33	ÊŎI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel Baffle- Former Assembly	Baffle-Edge Bolts	WCAP-13266, R1 Figs 6.1, 6.2, 6.3	688 Edge Bolts		Y							x		Visual (VT-3) examination, with baseline examination between 20 and 40 EFPY and subsequent examinations on a ten-year interval. Bolts and locking devices on high fluence seams. 100% of components accessible from the ccre side. Reference Figure 4-23 from MRP-227. No expansion required.
Category N 1. End 2. The 3. Am exar	otes: of Original License KPS Reactor Vesse inimum of 75% of th mined for inspection	is December 21, 2 I is projected to re total population credit.	013. ach 33 EFPY a (examined ÷ u	t End of nexami	f Origii ned), ii	nal Lie nclud	cense ing co	and over	I 52.1 I age co	EFPY a	at End nt with	of Life	Extension. xpansion crite	eria in Table 5-3, must be

Examination	Category: <u>MRP:227</u>	Description: <u>TABLE</u>	KE IFOURTH <i>I</i> A <u>4-3.westingh@</u>	WAU ND FI <u>USE PL</u>	-TA NEE F FITH II ANTS I	BLE POWE NTIEF	1 R ST RVAL RY/GC	ATI ISI MPG	ION SCHE DNENTS	DULE SBARE	LE-FOF	MER AS	SEMBLY BAF	FLE-FORMER BOLTS
Item No.	Parts Examined	ISI Drawing No.	Equipment.No	INT.	E Sch	xamin	ation	Perio	d EOJ	E) Vol	aminat Method	ion s Vis	Exemption, Code Case, or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel Baffle- Former Assembly	Baffle-Former Bolts	WCAP-13266, R1 Figs 6.1, 6.2, 6.3	728 Baffle Bolts		Y					x				Baseline volumetric (UT) examination between 25 and 35 EFPY, with subsequent examination on a 10-year inspection frequency per NRC SER TRC-5. 100% of accessible bolts or as supported by plant-specific justification. Heads accessible from the core side. UT accessibility may be affected by complexity of head and locking device designs. Reference Figures 4-23 and 4- 24 of MRP-227. Expansion Link – Lower support column bolts and barrel-former bolts.

1. End of Original License is December 21, 2013. The KPS Reactor Vessel is projected to reach 33 EFPY at End of Original License, 34.5 EFPY at Refueling Outage KR-34 (Spring 2015), and 52.1 EFPY at End of Life Extension.

2. Reference WCAP-15425 for KPS Minimum Baffle-Former Bolt Pattern.

3. Reference NRC SER dated June 22, 2011, Final Safety Evaluation of EPRI Report, Materials Reliability Program Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines".

			FOURTH	(EWA) AND I	T/ JNEE FIFTH	ABLE POW INTE	1 'ER S RVA	STA L IS	FION I SCH	EDUL	E			
Examination C	ategory: <u>MRP-227</u>	Description: TABLE	4-3 WESTINGHO	DUSE PL	ANTS I	PRIMA	RY CO	<u>DMPC</u>	<u>DNENT:</u>	S BAFF	LE - FC	RMER	ASSEMBLY – AS	SEMBLY
ltom No	Darta Examinad				E	xamin	ation	Perio	d	EX I	aminat Nethod	on s	Exemption, Code Case,	
item No.			No.		Sch	1	2	3	EOI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals												<u></u>	
Core Barrel Baffle-Former Assembly	Assembly	WCAP-13266, R1 Figs. 6.1, 6.2, 6.3 Attachment Figure 4	Baffle Former		Y							x		Visual (VT-3) examination to check for evidence of distortion, with baseline examination between 20 and 40 EFPY and subsequent examinations on a ten-year interval. Inspections are performed on the core side surface. Reference Figures 4-24, 4-25, 4-26, and 4-27 of MRP-227. No expansion required.
Category No 1. End 2. The I End	<u>otes:</u> of Original License KPS Reactor Vesse of Life Extension.	is December 21, 2 I is projected to re	013. ach 33 EFPY a	t End o	f Origiı	nal Lic	cense	ə, 34.	5 EFP	Y at Re	əfuelin	g Outa	ge KR-34 (Spri	ng 2015), and 52.1 EFPY at

			KE FOURTH A	WAUI ND FI	TAE NEE P FTH IN	BLE OWI	1 ER S RVAI	TAT _ ISI	ION SCHI	EDULI				
Examination	Category: <u>MRP-227</u> De	scription: <u>TABLE</u>	4-3 WESTINGHOU	SE PLA	<u>NTS PI</u>	<u>RIMA</u>	RY CC	<u>)MPC</u>	<u>NENT:</u>	S THER	IMAL SI	HIELD	ASSEMBLY - TI	HERMAL SHIELD FLEXURES
Hom No.	Doute From Inc.				Ē	camir	nation	Peri	Ъ	Ex	aminat Method	ion s	Exemption, Code Case,	2 tr
item NO.	Parts Examined	ISI Drawing No.		IN I	Sch		2	3	ÊÖI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel Thermal Shield Assembly	Thermal Shield Flexures	Attachment Figure 4	Thermal Shield Flexure 0°		Y .							×		Visual (VT-3) examination no later than 2 refueling outages from the beginning of the license renewal period. Subsequent examinations on a ten-year interval. 100% of thermal shield flexures. Reference Figures 4-29 and 4-36 of MRP-227. No expansion required.
Core Barrel Thermal Shield Assembly	Thermal Shield Flexures	Attachment Figure 4	Therma! Shieid Flexure 90°		Y							X		Same as above
Core Barrel Thermal Shield Assembly	Thermal Shield Flexures	Attachment Figure 4	Thermal Shield Flexure 180°		Y							X		Same as above
Core Barrel Thermal Shield Assembly	Thermal Shield Flexures	Attachment Figure 4	Thermal Shield Flexure 270°		Y							X		Same as above
Category N 1. En	<u>Notes:</u> d of Original License is	December 21, 20	13. The examination	ations	may b	e pei	rform	ed d	uring !	Refuel	ing Ou	tages	KR33 (Fall 20 [,]	13) or KR34 (Spring 2015).

Table 2

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Reactor Vessel Internals Inspection Plan

MRP-227

Westinghouse Plants Expansion Components

(7 pages)

KEWAUNEE POWER STATION DOMINION ENERGY KEWAUNEE, INC.

			KE FOURTH A	WAUN ND FII	TAI NEÈ P FTH IN	3LE OWI NTEF	2 ER S RVAL	TAT .ISI	ion Sche	DULI				
Examination C	Category: <u>MRP-227</u> I	Description: <u>TABLE</u>	4-6 WESTINGHOUS	<u>SE RLA</u>	NTS.EX	PAN	<u>SION.</u>	<u>COM</u>	PONEN	<u>TS CO</u>	RE BAR	REL F	ORMER ASSEME	BLY - BARREL-FORMER BOLTS
ltem No.	Parts Examined	ISI Drawing No.	Equipment No.	INŤ:	Sch.	kamin	ation 2	Perio 3	ed EOI	Ex Vol	aminati Method Sur	on s Vis	Exemption, Code Case, or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel- Former Assembly	Barrel-Former Bolts	WCAP-13266, R1 Figs 6.1, 6.2, 6.3	344 Barrel- Former Bolts		Ν					x				Primary Link- Baffle-Former Bolts. Volumetric (UT) examination, with initial examination dependent on results of baffle-former bolt examinations. Re-inspection is on a 10-year frequency. 100% of accessible bolts. Accessibility may be limited by presence of thermal shields or neutron pads. Reference Figure 4-23 of MRP-227. Expansion Link – Lower support column bolts and Barrel-former bolts.

- 1. End of Original License is December 21, 2013. The KPS RV is projected to reach 33 EFPY at End of Original License, 34.5 EFPY at KR-34 (spring 2015), and 52.1 EFPY at End of Life Extension.
- 2. Reference WCAP-13266, Revision 1 for details. The barrel-former bolts are fabricated from Type 347 stainless steel.
- 3. Examinations are scheduled per the Corrective Action Process if the number of indications on the Baffle-Former Bolts and Lower Support Column Bolts exceed the threshold.
- 4. Confirmation that more than 5% of the baffle-former bolts actually examined on the four baffle plates at the largest distance from the core (presumed to be the lowest dose locations) contain unacceptable indications shall require UT examination of the lower support column bolts within the next three fuel cycles.
- 5. Confirmation that more than 5% of the lower support column bolts actually examined contains unacceptable indications shall require UT examination of the barrel-former bolts.
- 6. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.
- 7. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

Examination (Category: MRP-227 D	escription #ABLE	K FOURTH 46.WESTINGHOU	EWAU AND F	TA NEE.I IFTHI	BLE POWI NTIEF	2 R S VAL		ION SCHE	DULE	/ER SU	PPORT	ASSEMBLY-L	OWER SUPPORT COLUMN
		BOLITS												
Item No.	Parts Examined	ISI Drawing No.	Equipment No.	INT	E Sch	xamin 1	ation 2	Péric 3	ed EOI	Vol	aminati Méthod Sur	ion s Vis	Exemption, Code Case, or Relief Request	Comments
	Reactor Vessel Internals							-			-			
Lower Support Assembly	Lower Support Column Bolts	W Drawing 882D685			N					X				Primary Link- Baffle-Former Bolts. Volumetric (UT) examination, with initial examinations dependent on results of baffle-former bolt examinations. Re-inspection is on a 10-year frequency. 100% of accessible bolts or as supported by plant-specific justification. Reference Figures 4-32 and 4-33 of MRP-227.

1. End of Original License is December 21, 2013. The KPS RV is projected to reach 33 EFPY at End of Original License, 34.5 EFPY at KR-34 (Spring 2015), and 52.1 EFPY at End of Life Extension.

- 2. Examinations are scheduled per the Corrective Action Process if the number of indications on the Baffle-former bolts and Lower Support Column bolts exceed the threshold.
- 3. Confirmation that more than 5% of the baffle-former bolts actually examined on the four baffle plates at the largest distance from the core (presumed to be the lowest dose locations) contain unacceptable indications shall require UT examination of the lower support column bolts within the next three fuel cycles.
- 4. Confirmation that more than 5% of the lower support column bolts actually examined contains unacceptable indications shall require UT examination of the barrel-former bolts.
- 5. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.
- 6. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

			KI FOURTH	EWAU ND F	TA INEE IETH	ABLE Row Intei	2 ER S RVAL	TAT ISI	ion Schi	EDUL:				
Examination	Category: <u>MRP-227</u> , D	escription: <u>TABLE</u> <u>BARRE</u>	4-6-WESTINGHOU LOUTLET NOZZI	JSE PL ES, CO	ANTS I DRE BA	EXPAN IRREL	ISION SAFE	ICOM TY IN	PONEI IJECTI	<u>NTS.CO</u> ON:NO2	RE BA	<u>RREL A</u> AND LO	ASSEMBLY - COR WER CORE BAR	RE BARREL FLANGE, CORE REL FLANGE WELD
						xamin	ation:	Perio	d	× ≇Éx	aminati Nethod	on s	Exemption, Code Case,	
Item No.		ISI Drawing No.	-Equipment No.		Sch		2	3	ÊOI	Vol.	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals													
Core Barrel Assembly	Core Barrel Flange (1), Core Barrel Outlet Nozzles(2), Safety Injection Nozzles (2)				Ν							X		Primary Link- Upper Core Barrel Flange Weld. Enhanced visual (EVT-1) examination, with initial examination dependent on the examination results for upper core barrel flange. Re-inspection on a 10-year frequency. 100% of one side of the accessible surfaces of the selected weld and adjacent base metal. Reference Figure 4-34 of MRP-227.

- 1. End of Original License is December 21, 2013. The KPS RV is projected to reach 33 EFPY at End of Original License, 34.5 EFPY at KR-34 (Spring 2015), and 52.1 EFPY at End of Life Extension.
- 2. Examinations are scheduled per the Corrective Action Process if a surface breaking indication with a length greater than two inches is observed in the upper core barrel flange weld.
- 3. The confirmed detection and sizing of a surface-breaking indication with a length greater than two inches in the upper core barrel flange weld shall require that the EVT-1 examination, and any supplementary UT examination, be expanded to include the core barrel-to support plate weld by the completion of the next refueling outage. If extensive confirmed indications in the core barrel-to-support plate weld are detected, further expansion of the EVT-1 examination shall include the remaining core barrel assembly welds.
- 4. If extensive cracking in the remaining core barrel welds is detected, EVT-1 examination shall be expanded to include the upper six inches of the accessible surfaces of the noncast lower support column bodies within three fuel cycles following the initial observation.
- 5. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.
- 6. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

			FOURTH	KEWAU AND FI	T/ NEE FTH	ABLE POW INTE	2 ER S RVAI	TA1 . ISI	TON SCHI	EDUL	E			
Examination	n Category: <u>MRP-227</u>	Description: <u>TABLE</u> BODI	4-6 WESTINGHO ES (NON CAST)	<u>USE PLA</u>	NTS E	<u>XPAN</u>	<u>sion (</u>	<u>COM</u>	<u>PONEN</u>	<u>TS LO</u>	WER SL	<u>JPPOR</u>	<u>TASSEMBLY -</u>	LOWER SUPPORT COLUMN
Item No.	Parts Examined	ISI Drawing No:	Equipment No.	INT	E Sch	xamin	ation 2	Perio	d EO	Ex Vol	aminati Method Sur	ion s Vis	Exemption, Code Case, or Relief Request	Comments
	Reactor Vessel Internals													
Lower Support Assembly	Lower Support Column Bodies (Non Cast)	W685J896			Ν							x		Primary Link- Upper Core Barrel Flange Weld. Enhanced visual (EVT-1) examination, with initial examination dependent on the examination results for upper core barrel flange. Re-inspection on a 10-year frequency. 100% of accessible surfaces. Reference Figure 4-34 cf MRP-227.

- 1. End of Original License is December 21, 2013.
- 2. Examinations are scheduled per the Corrective Action Process if a surface breaking indication with a length greater than two inches is observed in the upper core barrel flange weld.
- 3. The confirmed detection and sizing of a surface-breaking indication with a length greater than two inches in the upper core barrel flange weld shall require that the EVT-1 examination, and any supplementary UT examination, be expanded to include the core barrel-to support plate weld by the completion of the next refueling outage. If extensive confirmed indications in the core barrel-to-support plate weld are detected, further expansion of the EVT-1 examination shall include the remaining core barrel assembly welds.
- 4. If extensive cracking in the remaining core barrel welds is detected, EVT-1 examination shall be expanded to include the upper six inches of the accessible surfaces of the noncast lower support column bodies within three fuel cycles following the initial observation.
- 5. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.
- 6. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

			K FOURTH	EWAU AND FI	TA NEE F IFTH I	BLE POWE	2 ER S RVAL	TAT ISI	ION SCHE	DULE				
Examination C	Category: <u>MRP-227</u> [Description: <u>TABLI</u> BODI	<u>E4-6 WESTINGHO</u> ES (CAST)	<u>USE PL</u>	ANTS E	XPAN:	<u>sion</u>	<u>COM</u>	PONEN	<u>ITS LO</u>	<u>WER SI</u>	<u>JPPOR</u>	<u>ΓASSEMBLY-</u>	LOWER SUPPORT COLUMN
					E	xamin	ation	Peric	d	Êx	aminat Nethod	ion s	Exemption, Code Case,	
Item No.	Parts Examined	ISI Drawing No.	Equipment No.	INT.	Sch	1	2	3	EOI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals							÷						
Lower Support Assembly	Lower Support Column Bodies (Cast)	W685J896			N							X		Lower Support Column Bodies are not cast at Kewaunee Power Station. This expansion item [from the CRGT lower flange welds] is Not Applicable to KPS. Primary Link- Control Rod Guide Tube Lower Flanges. Visual (EVT-1) examination. 100% of accessible support columns. Reference Figure 4-34 of MRP- 227.

- 1. End of Original License is December 21, 2013.
- 2. Examinations are scheduled per the Corrective Action Process if a crack-like surface indication is observed.
- 3. Bottom-Mounted Instrumentation (BMI) column bodies. For BMI column bodies, the specific relevant condition for the VT-3 examination is completely fractured column bodies. Confirmation of surface breaking indications in two or more CRGT lower flange welds, combined with flux thimble insertion/withdrawal difficulty, shall require visual (VT-3) examination of BMI column bodies by the completion of the next refueling outage.
- 4. Lower support column bodies (cast) are not applicable to Kewaunee Power Station. Confirmation of surface breaking indications in two or more CRGT lower flange welds shall require EVT-1 examination of cast lower support column bodies within three fuel cycles following the initial observation. For cast lower support column bodies, the specific relevant condition is a detectable crack-like surface indication.
- 5. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.
- 6. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

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Examination Cat	legory: <u>MRP-227</u>	Description: <u>TABLE</u> COLU	<u>:4=6 WESTINGHO</u> MNIBODIES	<u>USEIPL</u>	ANTS E	<u>XPAN</u>	<u>SION.</u>	<u>COM</u>	<u>PONEN</u>	<u>ITS BÖ</u>	<u>і́Я́ОМ і</u>	<u>MOUNT</u>	<u>ED INSTRUMENT</u>	ATION SYSTEM - BMI
Item No.	Parts Examined	ISI Drawing No	Equipment No .	TINT:	Sch	xamin	ation 2	Peric 3	d EOI	Vol	aminat Vethod Sur	ion* s Vis	Exemption, Code Case, or Relief Request	Comments
	Reactor Vessel Internals													
Reactor Vessel Bottom Mounted Instrumentation System	Bottom-Mounted Instrumentation (BMI) Column Bodies (36)	W685J896			N							x		Primary Link- Control rod guide tube lower flanges. Visual (VT-3) examination of BMI column bodies as indicated by difficulty of insertion/withdrawal of flux thimbles. Flux thimble insertion/withdrawal to be monitored at each inspection interval. 100% of BMI column bodies for which difficulty is detected during flux thimble insertion/withdrawal. Re-inspection on a 10-year frequency. Reference Figure 4-35 of MRP-227.

1. End of Original License is December 21, 2013.

2. Examinations are scheduled per the Corrective Action Process if a detectable crack-like surface indication is detected in the CRGT lower flange welds.

3. Bottom-Mounted Instrumentation (BMI) column bodies. For BMI column bodies, the specific relevant condition for the VT-3 examination is completely fractured column bodies. Confirmation of surface breaking indications in two or more CRGT lower flange welds, combined with flux thimble insertion/withdrawal difficulty, shall require visual (VT-3) examination of BMI column bodies by the completion of the next refueling outage.

4. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.

5. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

· · ·			KE FQURTH A	WAUN ND FIF	TAE IEE PI TH IN	BLE 2 OWE	R-ST VAL	ATIO ISI S	DN CHEI	DULE				
Examination Description:	Category: <u>Supplement</u> WESTINGHOUSE DESI	to Table 4-6; NRC GNEDIREACTORS	Reference SER TR EXPANSION COM	<u>C=1</u> IPONEN	TS LOV	<u>VER S</u>	UPPO	RT F	<u>ORGIN</u>	<u>G & UP</u>	PER CO	<u>DRE PL</u>	<u>ATE</u>	
itom No.	Dorto Evominad	ISI Drowing Not		INT	Ē	xamin	ation.	Perio	id Silv	Ex	aminat Nethod	ion s	Exemption, Code Case,	Commente
			Equipment No:		Sch		2	3	ÊÖI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals													
Lower Support Forging	Lower Support Forging	M-1199			N							x		Primary Link- Control Rode Guide Tube Flange Welds. Visual (EVT-1) examination. Re-inspection on a 10-year frequency. 75% per NRC SER TRC-4.
Upper Core Plate	Upper Core Plate	M-1199			N							x		Primary Link- Control Rode Guide Tube Flange Welds. Visual (EVT-1) examination. Re-inspection on a 10-year frequency. 75% per NRC SER TRC-4.

1. End of Original License is December 21, 2013.

2. Examinations are scheduled per the Corrective Action Process if a crack-like surface indication is observed.

3. Upper Core Barrel Flange Welds and Control Rod Guide Tube Flange Welds. Confirmation of surface breaking indications shall require EVT-1 examination of the lower support forging & upper core support within three fuel cycles following the initial observation.

4. Reference NRC SER dated June 22, 2011, Final Safety Evaluation of EPRI Report, Materials Reliability Program Report 1016596 (MRP-227), Revision 0, "Pressurized Water Reactor (PWR) Internals Inspection and Evaluation Guidelines".

5. If expansion is needed/invoked then re-inspection is required on a 10-year frequency per NRC SER TRC-6.

6. Minimum coverage for expansion items is 75% per NRC SER TRC-4.

Table 3

Reactor Vessel Internals Inspection Plan

MRP-227

Westinghouse Plants Existing Programs Components

(3 pages)

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KEWAUNEE POWER STATION DOMINION ENERGY KEWAUNEE, INC.

			FOURT	KEWA I AND	T. UNEE FIFTH	ABLE POW	E 3 VER: ERVA	STAT	TON SCHI	EDUL:				
Examinatior	Category: <u>MRP-227</u>	Description: <u>TABL</u>	E4-9 WESTINGHC	<u>)USE:PĽ</u>	ANTS E	XISTIN	<u>NG PR</u>	<u>0GR/</u>	MS.CC	<u>MPONI</u>	<u>ENTS –</u>	<u>B-N-3, C</u>	ORE SUPPORT	<u>STRUCTURES</u>
ltem No.	Parts Examined	ISI Drawing No	Equipment No.	INT	(Sector	Examir	nation	Perio	d	Đ	caminal Methoc	tion Is	Exemption, Code Case,	Comments
					Sch.		2	3	EOI	Vol	Sur	Vis	or Relief Request	
	Reactor Vessel Internals									·				
B13.70	Core Barrel Assembly Core Barrel Flange	Attachment Figure 4 XK-67866	Reactor Vessel Core Barrel		Y				х			X²		VT-3 examination. Loss of material (wear).
B13.70	Upper Internals Assembly Upper Support Ring or Skirt	Attachment Figure 4 and Figure 5 XK-67866	Reactor Vessel Upper Internals Assembly Upper Support Ring or Skirt		Y	×	x	x				X		VT-3 examination. Cracking (IASCC, Fatigue)
B13.70	Lower Internals Assembly Lower Core Plate	Attachment Figure 4 and Figure 5 XK-67866	Reactor Vessel Lower Internals Assembly Lower Core Plate		Y				×			x		VT-3 examination of the lower core plate to detect evidence of distortion and/or loss of bolt integrity. Cracking (IASCC, Fatigue)
B13.70	Lower Internals Assembly Lower Core Plate	Attachment Figure 4 and Figure 5 XK-67866	Reactor Vessel Lower Internals Assembly Lower Core Plate		Y				×			x		VT-3 examination. Loss of material (wear).
B13.70	Alignment and Interfacing Components Upper Core Plate Alignment Pins	Attachment Figure 2 XK-67866	Reactor Vessel Upper Internals Upper Core Plate Alignment Pins		Y	×	х	x				x		VT-3 examination. Loss of material (wear).
Category 1. En	Notes: Id of Original License	is December 21,	2013.	•		·		•		•	•	.		

2. Examinations are performed when the core barrel is removed typically once per interval.

			Ki FOURTH /	EWAU AND F	NEE I Interi	BLE POWI NTEF	3 =R S RVA	TA L IS	TION I SCH	IEDUL	Ē			
Examination	n Category: <u>MRP-227</u>	Description <u>TABLE</u>	4-9 WESTINGHOUS	SE EXIS	TING P	ROGR	AMS	COI	MPONE	<u>NTS</u>	B-N-1,	NTERIC	DR OF REACTOR	<u>RVESSEL</u>
ltem No.	Parts Examined	ISI Drawing No	Equipment No.	ÎNT.	Ð	(amina	tion	Perio	od .		Method	s ion	Exemption, Code Case, or Relief	Comments
					Sch	_1 _	2	3	EOI	Vol	Sur	Vis	Request	
	Reactor Vessel Internals													
B13.10	Alignment and Interfacing Components Clevis Insert Bolts	Attachment Figure 4	Reactor Vessel Interior Surface		Y							×		VT-3 examination once per interval when the lower internals is removed.
Category 1. En	Notes: Notoriginal License	e is December 21, 2	033.	L		II	4			J	I <u></u>			L

2. The clevis insert bolts are located on the reactor vessel below the lower internals.

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3. Per B-N-1, areas to be examined shall include the spaces above and below the reactor core that are made accessible for examination by removal of the components during normal refueling outages. The lower internals is typically removed once per interval.

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Examination	Category: <u>MRP-227</u> [Description: TABLE INSTR	4-9 WESTINGHOUS	<u>SE EXIS</u> FEM FL	<u>TING P</u> UX THIN	ROGR IBLE	AMS TUBI	<u>CON</u> <u>S</u>	<u>MPONE</u>	<u>NTS – I</u>	EB-88-	<u>09 – RE</u>	ACTOR VESSEL	BOTTOM MOUNTED
14 - - -					Ex	amina	tion	Peric	d.	Ëx	aminat Vethod	ion s	Éxemption, Code Case.	
item No.	Parts Examined	ISI Drawing No.	Equipment No.		Sch		2	3	EOI	Vol	Sur	Vis	or Relief Request	Comments
	Reactor Vessel Internals												<u> </u>	
IEB 88-09	Reactor Vessel Bottom Mounted Instrumentation System Flux Thimble Tubes		Flux Thimble Tubes (36)		Y			·			x			Eddy Current Examination of the Flux Thimble Tubes Once Every Five Years.

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Table 4

NUREG-1801, XI.M13, Inspection Plan

Cast Austenitic Stainless Steel (CASS) Reactor Vessel Internal Components

(2 pages)

KEWAUNEE POWER STATION DOMINION ENERGY KEWAUNEE, INC.

TABLE 4 (Page 1 of 2) KEWAUNEE POWER STATION FOURTH OR FIFTH INTERVAL ISI SCHEDULE														
Examination Category: NUREG-1801, XI.M13 Description CAST AUSENITIC STAINLESS STEEL ITEMS														
Item No.	Parts Examined	ISI Drawing No:	Equipment .	INT	Examinatio			in Period		Examination Methods		ion S Vis	Exemption, Code Case, or Relief	Comments
	Reactor Vessel Internals												request	
BMI Columns Assemblies	BMI Column Cruciforms (16)	M-1199 XK-100-1963			Y ^{1,2}				х			X³		EVT-1 of Accessible Surfaces. The BMI Column Cruciforms are classified as NAM.
Upper Internals Mixing Devices	Mixing Devices (34)	M-1199			Y ²				х			X3		EVT-1 of Accessible Surfaces. The upper internals mixing devices are classified as NAM.
Upper Internals Instrumentation	Supports (19)	M-1199 XK-100-1961			Υ²				х			X³		EVT-1 of Accessible Surfaces. The upper internals instrumentation supports are classified as NAM.
Upper Internals Instrumentation	Clamps (28)	M-1199 XK-100-1961			Y ²				х			X ³		EVT-1 of Accessible Surfaces. The upper internals Instrumentation clamps are classified as NAM.
Upper Support Column Assemblies	Bases (16)	M-1199			Y ²				х			X³		EVT-1 of Accessible Surfaces. The upper support column assemblies' bases are classified as NAM.

TABLE 4 (Page 2 of 2) KEWAUNEE POWER STATION FOURTH INTERVAL ISI SCHEDULE											
Examination Category: NUREG-1801, XI.M13 Description: CAST AUSTENITIC STAINLESS STEEL ITEMS											
ltem No.	Parts Examined	ISI Drawing No	-Equipment No.	INT.	xamination	Period 3 EOI	Examina Metho Vol Sur	ition ds Vis	Exemption, Code Case, or Relief Request	Comments	
Upper Support Column Assemblies	Thermocouple Stops (39)	M-1199		Y ²		X		X ³		EVT-1 of Accessible Surfaces. The upper support column assemblies' thermocouple stops are classified as NAM.	

- 1. Examination of BMI column bodies including the CASS-BMI column cruciform's are invoked on an as-needed basis through the corrective action process under MRP-227, as an Expansion Component, when difficulty is detected during flux thimble insertion/withdrawal. Flux thimble insertion/withdrawal to be monitored at each inspection interval.
- 2. The Upper Core Plate Mixing Devices, Upper Instrumentation Conduit Supports, Upper Instrumentation Clamps, Upper Support Column Bases, Upper Support Thermocouple Stops (at mixing flow Devices), and BMI Column Cruciform's have been classified by Westinghouse Electric Company as NAM. Accessible surfaces of the Mixing Devices, Instrument Columns (Conduit Support and Clamp), and Support Columns Bases, Thermocouple Stops, and BMI Column Cruciform's are currently inspected under ASME Section XI, Category B-N-3, each interval.
- 3. EVT-1 inspection is not required if screening or evaluation described in GALL NUREG-1801, Rev 1, Chapter XI.M13 is satisfied for fluence < 10E17 n/cm² [or <10E20 n/cm² if agreement is reached with the NRC], ferrite content (Hull's equivalent factor from NUREG/CR-4513, Rev 1), loading as compressive or less than 5 ksi, or if a component specific evaluation to determine the component's susceptibility to loss of fracture toughness is successful.
- 4. Target dates for inspection include either KR 32 (Spring 2012), KR 33 (Fall 2013), or KR 34 (Spring 2015).