NMC
Committed to Nuclear Excellence

Monticello Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

August 11, 2005

L-MT-05-089
10 CFR Part 54

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

Monticello Nuclear Generating Plant
Docket 50-263
License No. DPR-22

Documentation of Responses to Aging Management Program and Aging Management Review Audits for the Monticello License Renewal Application (TAC No. MC6440)

Reference: 1) NMC letter to NRC, "Application for Renewed Operating License," dated March 16, 2005

Pursuant to 10 CFR 54, the Nuclear Management Company, LLC, (NMC) submitted a License Renewal Application (LRA) (Reference 1) to renew the operating license for the Monticello Nuclear Generating Plant (MNGP).

During the weeks of June 13, 2005, and July 25, 2005, members of the U.S. Nuclear Regulatory Commission (NRC) Staff conducted on-site audits of the aging management programs and the reviews developed by NMC in support of Reference 1. During this audit, the NRC Staff reviewed the MNGP license renewal program supporting documentation. The NRC Staff also had the opportunity to ask questions concerning the details of the MNGP license renewal program.

At the conclusion of the audit on July 29, 2005, NMC was requested to document, in a written submittal to the NRC, our response to 15 questions raised during the audit. The purpose of this letter is to provide these responses. Refer to Enclosure 1 for the requested information.

This letter makes the following new commitments:

- The NMC fleet procedure for the Flow Accelerated Corrosion Inspection Program will be revised to include the accepted 87.5% of nominal pipe wall thickness for nonsafety-related piping as a trigger point for engineering analysis. This commitment will be documented in the first Annual LRA Supplement required by 10 CFR Part 54, §54.21(b). (Enclosure 1, Item B2.1.19-05).

A113

2807 West County Road 75 • Monticello, Minnesota 55362-9637
Telephone: 763.295.5151 • Fax: 763.295.1454

- Prior to the period of extended operation, coating inspectors will meet the requirements of ANSI N45.2.6. This commitment will be documented in the first Annual LRA Supplement. (Enclosure 1, Item B2.1.27-04).

- Necessary changes to the text of the LRA noted in Enclosure 1 will be summarized in the first Annual LRA Supplement.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 11, 2005.

for

John T. Conway
Site Vice President, Monticello Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Monticello, USNRC
License Renewal Project Manager, Monticello, USNRC
Resident Inspector, Monticello, USNRC
Minnesota Department of Commerce

ENCLOSURE 1

RESPONSE TO NRC QUESTIONS DEVELOPED DURING AUDITS OF THE LICENSE RENEWAL PROGRAM THE WEEKS OF JUNE 13, 2005, AND JULY 25, 2005 AT THE MONTICELLO NUCLEAR GENERATING PLANT

A. NRC Audit Item 3.1-03

LRA Appendix B2.1.19 (Flow Accelerated Corrosion) lists nine systems included in the program. These are Chemistry Sampling, Condensate/Feedwater, HPCI, Main Steam, RCIC, Reactor Head Vent, Reactor Recirculation, RWCU, and Turbine Generator. However, no component line item from Table 3.2.2-6 (ESF-RCIC) is indicated to be included in the FAC Program.

Question:

Please resolve the conflict between the AMP description and the table. What change will be required in the LRA?

For the REC, RHV, CFW, MST, TGS and RWC Systems, the LRA includes separate line items for "piping and fittings" and for "valve bodies." However, for the HPCI and RCIC Systems the LRA lists only "piping and fittings" and for the Chemistry Sampling System the LRA lists only "valve bodies." Do the systems that list only valve bodies also contain piping and fittings that are in the FAC program? And, do the systems that list only piping and fittings also contain valves that are in the FAC program?

For the Recirculation System, what specific pipe segments are included within the FAC program?

NMC Response

a) Carbon steel Reactor Core Isolation Cooling (RCI) piping exposed to treated water is susceptible to Flow Accelerated Corrosion (FAC) as shown in License Renewal Application (LRA) Table 3.2.2-6, on the bottom of page 3-189. Therefore, no conflict exists and no LRA change is needed.

(b) Only the carbon steel piping and fittings in the High Pressure Coolant Injection (HPC) and the RCI systems are susceptible to FAC. These are small portions of the steam line drains and the connection to the Feedwater System. The other components in the steam line drains are stainless steel and not susceptible to FAC.

(c) LRA Table 3.3.2-2, Page 3-296 will be revised to remove the line item for the Chemistry Sampling carbon steel valve susceptible to FAC. In addition, the LRA Appendix B2.1.19 (Flow Accelerated Corrosion)

Program will be revised to remove the Chemistry Sampling System from the list of systems, which it manages.

(d) The bottom head drain piping from the vessel to the connection to the Reactor Water Cleanup (RWC) System is in the Reactor Recirculation (REC) System and susceptible to FAC.

B. NRC Audit Item 3.1-10

Plant-Specific AMP B2.1.32 (System Condition Monitoring Program) is applied to manage the aging effect of loss of material due to general or galvanic corrosion for the external surface of various carbon steel components in the Reactor Head Vent, the Reactor Recirculation or the Reactor Vessel Instrumentation System.

The System Condition Monitoring Program is a Plant Specific AMP, not described in NUREG-1801.

Question:

Please justify application of Note A to these line items.

NMC Response

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Item V.E.1-b requires a "plant specific aging management program" to manage loss of material on the external surfaces of carbon steel components. As stated in the question, the System Condition Monitoring Program is a plant specific aging management program and the methodology employed by NMC for the MNGP required assigning a note, i.e., Note A, which states: "Consistent with NUREG-1801 item for component, material, environment and aging effect. AMP [Aging Management Program] is consistent with NUREG-1801 AMP." However, since NUREG-1801 states that further evaluation of these line items is required, then Note E, which states: "Consistent with NUREG-1801 for material, environment and aging effect, but a different aging management program is credited." should have been assigned in order to address the evaluation required for this line item.

Therefore, in each instance where the 'LRA 3.X.2 Tables' credit the System Condition Monitoring Program for aging management and the NUREG-1801 line item referenced credits a plant specific aging management program where further evaluation is required, Note E should be assigned.

C. NRC Audit Item 3.1-18

The Discussion in 3.1.1-23 says:

> This line item is not used at MNGP. The reactor coolant systems components of CASS material are portions of the Jet Pump, Fuel Support, and CRD assemblies. See items 3.1.1-31 and 3.1.1-33 for these components. In addition, CASS valve bodies in the ESF system are discussed in Item 3.2.1-11 of Table 3.2.1.

The Discussion in 3.2.1-11 says:

> Not Applicable. CASS components in the ESF systems subject to an environment that supports loss of fracture toughness due to thermal aging embrittlement were assigned the ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD Program. Those CASS components that are subject to this effect/ mechanism are valves. This component type screens out from being subject to the thermal aging embrittlement of CASS AMP per NUREG-1801, Volume 2, Appendix B, Section XI.M12.

No line items in Table 3.1.2-1 through 3.1.2-5 are referenced to Table 1 Line Item Number 3.1.1-23. One line in Table 3.2.2-3 and one line in Table 3.2.2-7 reference to Line Item Number 3.1.1-23.

Question:

Please resolve the apparent discrepancy of lines in the 3.2.2-3 and -7 tables referencing to a Line Item Number where the discussion says, "This line item is not used at MNGP."

NMC Response

LRA Table 3.1.1, Item Number 3.1.1-23, should be revised to read, "Cast Austenitic Stainless Steel (CASS) components in the Engineered Safety Feature (ESF) systems subject to an environment that supports loss of fracture toughness due to thermal aging embrittlement were assigned the American Society of Mechanical Engineers (ASME) Section XI In-Service Inspection, Subsections IWB, IWC, and IWD Program. Those CASS components that are subject to this aging effect/mechanism are valves."

D. NRC Audit Item 3.1-20

GALL, Volume 1, Table 1, includes a component line item of small-bore reactor-coolant system and connected system piping (Class 1). The applicable material is stainless steel or carbon steel. The applicable environment is 288 deg-C reactor coolant water. The applicable aging effect/mechanisms are crack initiation and growth due to stress corrosion cracking, IGSCC, or thermal and mechanical loading. The applicable aging management programs are ASME Section XI, Water Chemistry, and One-Time Inspection.

The GALL, Volume 1, Table 1 line corresponds to MNGP LRA line item number 3.1.1-07. The only systems that reference to this line item are the reactor recirculation system, the head vent system and the reactor vessel instrumentation system.

Question:

Why are there not other systems referencing to line item number 3.1.1-07, examples of which are as follows:

- Reactor water clean-up system - 2", carbon steel line from vessel drain?
- RCIC System - 3" carbon steel steam line and RCIC steam flow instrument lines?
- HCPI System - HPCI steam flow instrument lines?
- Main Steam System - Flow instrument lines, 2" carbon steel drain lines from Inboard MSIVs to main condenser?

NMC Response

Consistent with the NUREG-1801, "small bore piping less than 4 inch nominal pipe size (NPS) that performs a License Renewal intended function has been evaluated for the crack initiation and growth aging effect. Small bore piping in Class 1 applications determined to be susceptible to this aging effect has been included in the Plant Chemistry and One-Time Inspection aging management programs. The One-Time Inspection program will be used to verify cracking is not occurring and that chemistry is effective. For the MNGP, this includes small-bore stainless steel piping in Class 1 applications that is susceptible to a stress corrosion cracking (SCC) aging mechanism. Piping meeting these criteria are contained in various plant systems. As noted in the question, this is addressed in Table Item Number 3.1.1-07 of the LRA for the Reactor Recirculation, Reactor Head Vent, and Reactor Vessel Instrumentation Systems. For other systems, this is addressed in other LRA sections as described further below.

Separate from SCC, intergranular stress corrosion cracking (IGSCC) was not identified as an applicable aging mechanism. The MNGP pipe replacement

program resolved IGSCC issues discussed in NRC Generic Letter 88-01 and NUREG-0313, Revision 2, by the replacement of Class 1 piping and welds with resistant materials. Welds are now classified as IGSCC Category "A."

The MNGP followed the guidance of Interim Staff Guidance (ISG)-12 for applicable aging mechanisms and one-time inspections of small bore piping. This guide can be followed by plants not experiencing cracking of small-bore Class 1 piping. The MNGP has not experienced internal cracking due to SCC or thermal cycling due to thermal stratification or turbulent penetration in Class 1 small bore piping. ISG-12 identified the need to address SCC and thermal cycling due to thermal stratification or turbulent penetration. For Class 1 stainless steel small bore piping, SCC was identified as an aging mechanism and is addressed in the LRA. For Class 1 carbon steel small bore piping, SCC was not identified as an applicable aging mechanism based on plant operating experience and consistent with Electric Power Research Institute (EPRI) TR-1003056, "Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools", Revision 3. EPRI TR-1003056 notes a nitrite based corrosion inhibitor environment is required for carbon steel SCC. Such an environment is not present in the reactor coolant.

As noted in the NRC Safety Evaluation Report on the use of a Risk-Informed ISI Program at the MNGP, EPRI TR-1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)" was used to address thermal cycling due to thermal stratification or turbulent penetration. Use of EPRI TR-1000701 is consistent with ISG-12. Analysis using this method identified only two locations potentially susceptible to thermal stratification, cycling, and striping (TASCS). Both locations are in the Feedwater System and neither of these locations is in small-bore piping. The results of this analysis, combined with reviews of industry and plant experience, are considered valid for concluding small bore Class 1 carbon steel piping is not susceptible to cracking due to TASCS. This has further been confirmed through examinations conducted of both large and small bore piping welds during the 2003 and 2005 outages as part of the Inservice Inspection Program. Ultrasonic test results for the last two outages (2003 and 2005) identified no reportable indications. In 2005 this included three welds in large bore piping in the potentially TASCS susceptible area of the Feedwater System. As these recent tests (within 6 years of extended operation) were performed in accordance with ASME Section XI requirements and because they included the area deemed most susceptible to TASCS, they (in effect) meet the intent of a one-time inspection to verify an aging effect is not occurring. Therefore, carbon steel small-bore Class 1 piping cracking due to TASCS was not included in the LRA. Separately, fatigue has been addressed for Class 1 piping as a Time Limited Aging Analysis (TLAA) as described in Section 4.3.3 of the LRA.

In summary, crack initiation and growth in Class 1 small bore piping was only identified for stainless steel piping susceptible to stress corrosion cracking. However, the loss of material aging effect is addressed for both stainless steel

and carbon steel small bore piping as part of the One-Time Inspection and Plant Chemistry programs.

Relative to the specific piping elements included in the above question:

- The Reactor Water Clean-up System 2" carbon steel vessel drain line (REW31-2"-ED) is covered by the carbon steel "Piping and Fittings" component in a treated water environment and relies upon Plant Chemistry and One-Time Inspection programs for aging management (see LRA Table 3.3.2-15). The applicable aging effect is loss of material. There is no crack initiation and growth aging effect for the reasons described above.

- The RCIC System 3" carbon steel steam line (PS17-3"-ED) is covered by the carbon steel "Piping and Fittings" component in a steam environment and relies upon Plant Chemistry and One-Time Inspection programs for aging management. The applicable aging effect is loss of material (see LRA Table 3.2.2-6). There is no crack initiation and growth aging effect for the reasons described above.

- The RCIC System steam flow instrument lines (flow element elbow taps) are covered by the stainless steel "Piping and Fittings" component in a steam or treated water environment and relies upon Plant Chemistry and One-Time Inspection for both crack initiation and growth and loss of material aging effects (see LRA Table 3.2.2-6).

- The HPCI System steam flow instrument lines (flow element elbow taps) are covered by the stainless steel "Piping and Fittings" component in a steam or treated water environment and relies upon Plant Chemistry and One-Time Inspection for both crack initiation and growth and loss of material aging effects (see LRA Table 3.2.2-4).

- The Main Steam System 2" carbon steel drain lines (PS15A-2"-ED, PS15B-2"-ED, PS15C-2"-ED, and PS15D-2"-ED) are covered by the carbon steel "Piping and Fittings" component in a steam or treated water environment and relies upon Plant Chemistry and One-Time Inspection programs for aging management. The applicable aging effect is loss of material (see LRA Table 3.4.2-4). There is no crack initiation and growth aging effect for the reasons described above.

- The Main Steam System flow instrument lines (line taps off FE-2-114A, B, C, and D) are covered by the stainless steel Piping and Fittings component in a steam or treated water environment and relies upon Plant Chemistry and One-Time Inspection for both crack initiation and growth and loss of material aging effects (see LRA Table 3.4.2-4).

Relative to other small bore, Class 1, stainless steel or carbon steel piping, aging effects are managed by Plant Chemistry and the One-Time Inspection program through the respective "Piping and Fittings" component in the associated system 3.X.2 table of the LRA.

E. **NRC Audit Item 3.2-10**

Table Item 3.2.1-14 related to ECCS valves and lines to and from the HPC (should be HPCI) and RCI pump turbines.

This entire line item is missing from the Excel Spreadsheet covering this topic. The evaluator cannot determine if the applicant is consistent with NUREG-1801, Volume 2.

Question:

Where is the data to confirm Table 1 line item 3.2.1-14?

NMC Response

NUREG 1801 Chapter V does not contain a line item which covers Emergency Core Cooling System (ECCS) piping in treated water susceptible to FAC. Therefore, Table 1 line item 3.2.1-14 was not used. Instead ECCS piping and fittings, exposed to treated water, susceptible to FAC, used Table 1 line item 3.1.1-25, Table 2 line item IV.C1.1-c for a better match.

LRA Table 1 line item 3.2.1-14 needs to be revised from "Aging effect is managed by the Flow-Accelerated Corrosion Program." to "This line item is not used at MNGP."

F. **NRC Audit Item 3.3-04**

Table 1 item 3.3.1-5: Table 2 line item for "Pump Casings"/"Gray Cast Iron"/"Plant Indoor Air" identifies an "Aging Effect Requiring Management" of "Loss of Material - Selective Leaching."

Question:

1. Please explain how this Aging Mechanism occurs.

2. Also, Note that GALL Table 1 item 3.3.1-5 does not discuss an Aging Mechanism of Selective Leaching.

NMC Response

1. The selective leaching aging mechanism was listed in error. The line item will be deleted.

2. Loss of Material due to the aging mechanism selective leaching is not listed in NUREG 1801, Volume 2 Line Item VII.I.1-b and therefore the aging mechanism would not appear in Volume 1 line item 3.3.1-5. However, 3.3.1-5 does discuss the aging management of loss of material.

G. NRC Audit Item 3.3-06

(DGN) Table 1 item 3.4.1-12: 5 Table 2 line items refer to this Table 1 item number and Note 26 which states; "In some cases, an applicable Volume 2 line item may be utilized from a different Chapter (i.e., Auxiliary Systems, Chapter VII vice Engineering Safety Features, Chapter V) if there was no appropriate line item for this combination in the associated system Chapter. These line item numbers are annotated with this Note and additional Notes may also be utilized."

The Table 1 entry states that item 3.4.1-12 is "Not Applicable to MNGP." Additionally, it is noted that Table 1 item 3.3.1-18 contains the same material/environment/aging effect combination as item 3.4.1-12.

Question:

1. Please reconcile this apparent contradiction.

NMC Response

LRA Table 1 item 3.4.1-12 should be revised to: "Emergency Diesel Generators System Oil Storage Tank external surface is managed by the Buried Piping & Tanks Inspection Program."

Table 1 item 3.3.1-18 is for the component type of buried piping and fittings, whereas item 3.4.1-12 covers buried tanks. Since the subject is buried oil tanks, item 3.4.1-12 was a better match.

H. NRC Audit Item 3.5-02

LRA Table 3.5.2-13, Carbon Steel, Low Alloy Steel in Treated Water. (There are two such entries in Table 3.5.2-13.) For GALL item II.B1.1.1-a, two AMPs are recommended: ASME Section XI, Subsection IWE (Primary containment ISI) and 10 CFR Part 50, Appendix J. However, in the LRA, not the same two AMPs

are recommended. The recommended AMPs are Primary containment ISI and Plant Chemistry. Please explain the discrepancy.

In addition, for the plant chemistry program it appears that the wrong Note is used. Namely, since a different program is used (Plant Chemistry), the Note should have been E, not D. Please explain.

Finally, for the Primary containment ISI it appears that the wrong Note is used. Namely, since the AMP has no exceptions, the Note should have been either C or A. Please explain.

NMC Response

For the first entry in LRA Table 3.5.2-13, structural steel components in treated water were included under line item II.B1.1.1-a. These components are different but consistent with NUREG-1801 item for material, environment, and aging effect. NUREG-1801 AMPs for line II.B1.1.1-a include ASME Subsection IWE Program, 10 CFR Part 50, Appendix J Program, and Protective Coatings Program. The Protective Coating Monitoring & Maintenance Program was not credited for managing loss of material due to corrosion. The Primary Containment In-Service Inspection Program is consistent with the NUREG-1801 AMP and the Plant Chemistry Program is a different aging management program. 10 CFR Part 50, Appendix J Program refers to pressure retaining components. Structural steel does not perform any pressure retaining function and therefore Appendix J Program is not applicable.

Yes, note "C" should have been indicated.
Summary: LRA line II.B1.1.1-a for the component structural steel in a treated water environment for the AMP Primary Containment In-Service Inspection Program should have been note "C" and not note "D."

Yes, note "E" should have been indicated.
Summary: LRA line II.B1.1.1-a for the component structural steel in a treated water environment for the AMP Plant Chemistry Program should have been note "E" and not note "D."

For the second entry in LRA Table 3.5.2-13, components including support members, welds, bolted connections, torus internal catwalk support columns in treated water were included under line item II.B1.1.1-a. These components are different but consistent with NUREG-1801 item for material, environment, and aging effect. NUREG-1801 AMPs for line II.B1.1.1-a include the ASME Subsection IWE Program, 10 CFR Part 50, Appendix J Program, and the Protective Coatings Program. The Protective Coating Monitoring & Maintenance Program was not credited for managing loss of material due to corrosion. The Primary Containment In-Service Inspection Program is consistent with the NUREG-1801 AMP and the Plant Chemistry Program is a different aging management program. 10 CFR Part 50, Appendix J Program refers to pressure

retaining components. Support members, welds, bolted connections, torus internal catwalk support columns do not perform any pressure retaining function and therefore Appendix J Program is not applicable.

Yes, note "C" should have been indicated.
Summary: LRA line II.B1.1.1-a for the components support members, welds, bolted connections, torus internal catwalk support columns in a treated water environment for the AMP Primary Containment In-Service Inspection Program should have been note "C" and not note "D."

Yes, note "E" should have been indicated.
Summary: LRA line II.B1.1.1-a for the components support members, welds, bolted connections, torus internal catwalk support columns in a treated water environment for the AMP Plant Chemistry Program should have been note "E" and not note "D".

I. NRC Audit Item 3.5-03

LRA Table 3.5.2-13, Carbon Steel, Low Alloy Steel in Air/Gas. Primary Containment Inservice Inspection Program takes no exceptions. Therefore, Note C should have been indicated instead of Note D. Please explain.

NMC Response

Yes, note "C" should have been indicated.

Summary: LRA line II.B1.1.1-a, for the components structural steel inside torus, torus internal catwalk in an air/gas environment for the AMP Primary Containment In-Service Inspection Program should have been note "C" and not note "D."

J. NRC Audit Item B2.1.2-14

B2.1.2 In MNGP LRA discussion of Scope of Program for this AMP, seven (7) systems are listed as having components whose aging is managed by this program. These systems appear to be systems that have direct interfaces with the reactor pressure vessel (RPV).

Question:

What about other systems whose piping directly interfaces with the RPV (e.g., main steam system, feedwater system) or which comprises part of the reactor coolant pressure boundary but which may not directly interface with the RPV (e.g., the high pressure coolant injection system, the reactor core isolation

cooling system, standby liquid control system)? Are components of these (and similar) systems also included in the program?

NMC Response

The majority of the reactor coolant piping in the Main Steam, Feedwater, HPCI and RCIC Systems is carbon steel and is not susceptible to cracking and therefore, would not credit the ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD Program. There is some small-bore stainless steel Class 1 piping in these systems. This piping is managed for cracking with the Plant Chemistry Program and the One-Time Inspection Program and references NUREG-1801 line item V.D2.1-c for components in GALL Chapters V (ESF) and VIII (SPC). The One-Time Inspection Program is credited instead of the Boiling Water Reactor Stress Corrosion Cracking (BWRSCC) Program since the BWRSCC Program does not address small-bore piping. For Chapter IV (RCS) piping, the ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD Program, Plant Chemistry Program and One-Time Inspection Program are credited for managing cracking and reference NUREG-1801 line item IV.C1.1-i.

After further review of these systems, it was determined that a stainless steel piping segment in a treated water environment in the Standby Liquid Control System has the potential for cracking due to its proximity to the RPV. This segment is line number CH2-1 ½"-ECB to the RPV nozzle and is shown on LR-36253 (B,8). LRA Table 3.3.2-17 Auxiliary Systems - Standby Liquid Control System, Page 3-487, will be revised to include the aging effect of Cracking for this stainless steel piping with an internal treated water environment, crediting the ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD, Plant Chemistry and One-Time Inspection Programs. This will be NUREG-1801, Volume 2 Line Item IV.C1.1-i and Table 1 Item 3.1.1-7. Additionally, AMR-SLC, Revision 1, Standby Liquid Control System, shall be added to Table 7.2, Aging Management Review Reports, of the Aging Management Program Basis Document, PBD/AMP-033, ASME Section XI Inservice Inspection Subsections IWB, IWC, and IWD.

K. NRC Audit Item B2.1.19-05

In MNGP's response to the previous audit question B2.1.19-01, MNGP stated that it will revise its procedure for the FAC inspection program to use the industry accepted 87.5% of the nominal pipe wall thickness for non safety-related piping as a trigger point for an engineering evaluation. Please confirm this commitment and list it in the MNGP LRA supplement.

NMC Response

The NMC fleet procedure for the Flow Accelerated Corrosion Inspection Program will be revised to include the accepted 87.5% of nominal pipe wall thickness for nonsafety-related piping as a trigger point for engineering analysis. This action is entered and being tracked in the NMC corrective action process.

This commitment will be documented in the first Annual MNGP LRA Supplement.

L. NRC Audit Item B2.1.26-01

A number of relief requests were cited throughout the LRA. Examples include many relief requests in B2.1.26, "Primary Containment In-Service Inspection Program." The verbiage in the LRA implied that these relief requests were not exceptions to NUREG-1801 since they were approved by the NRC and they were applicable during the period of extended operation.

10 CRF 50.54 states that the license renewal application must contain information for each structure and component within the scope of license renewal concerning the demonstration that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operations.

Please identify the code cases and relief associated with aging management of structures and components within the scope of license renewal. Explain how the structures and components aging effects associated with the code cases and relief requests will be managed. Provide background documentation and indicate planned changes to the LRA.

NMC Response

Select relief requests were described in the LRA as they are part of the current MNGP ASME Section XI programs that are credited for managing aging effects. Code cases and relief requests were not considered exceptions to NUREG-1801 as they are temporary in nature and, in many cases, expire prior to the period of extended operation. The code cases and relief requests for the MNGP ASME Section XI, Subsections IWE Inservice Inspection Program are valid through the first inspection interval, which ends prior to the period of extended operation on September 8, 2008. The code cases and relief requests of the MNGP ASME Section XI In-Service Inspection, Subsections IWB, IWC, IWD and IWF are valid for approximately 21 months into the period of extended operation. The program for the current inspection interval ends May 31, 2012.

In addition to the temporary nature of code cases and relief requests (i.e., alternatives), alternatives that carry into the period of extended operation were

reviewed and determined to not impact aging management and were, therefore, not considered exceptions to NUREG-1801. The results of this evaluation are included in two attached tables, immediately behind the answer to this audit item. The two tables are entitled:

- Table 1 - NRC Audit Item B2.1.26-01: Alternatives to ASME Section XI, ISI Program Impact on Aging Management
- Table 2 - NRC Audit Item B2.1.26-01: ASME Section XI, ISI Program, Regulatory Guide 1.147 Code Case Impact on Aging Management

Based on recent discussions with the NRC, it has become apparent that some of these alternatives should be considered exceptions to NUREG-1801. Though statements in the LRA are correct based on the above discussion, the following clarification is provided:

> The alternatives presently implemented by the ASME Section XI In-Service Inspection, Subsections IWB, IWC, IWD and IWF Programs have no impact on aging management. However, some alternatives alter the method in which the ASME Section XI In-Service Inspection Program manages aging as compared to the description of the programs as contained in NUREG-1801, Chapter XI. Therefore, these alternatives will be considered exceptions to NUREG-1801 where relied upon in the MNGP aging management programs.

The above clarification should be used in lieu of any statements in the LRA indicating: "Exceptions to ASME Code requirements that have been granted by approved Code Cases or relief requests, or modifications by 10 CFR 50.55(a) are not considered to be exceptions to NUREG-1801 criteria."

The following audit question responses were encompassed by this audit question, B2.1.26-01: Audit questions numbers B2.1.2-03, B2.1.2-07, B2.1.2-13, B2.1.26-01a, B2.1.26-02, B2.1.26-03, B2.1.26-04, B2.1.26-05, B2.1.28-01, and B2.GEN-01.

This audit question, B2.1.26-01, does not adequately address all the concerns listed in audit questions B2.1.2-01, B2.1.10-01, and B2.1.9-03. The entire audit question and responses for audit questions B2.1.2-01, B2.1.10-01, and B2.1.9-03 are discussed below:

L.1. <u>NRC Audit Item B2.1.2-01</u>

The Program Description for AMP XI.M1 in NUREG-1801, April 2001, states that "this program generally includes ...all Class 1, 2 and 3 pressure retaining components and their integral attachments." The MNGP LRA Program Description for MNGP AMP B2.1.2 (ASME Section XI In-Service Inspection,

Subsections IWB, IWC, and IWD) states that Class 1 and 2 piping is being inspected in accordance with the RI-ISI as described in EPRI TR-112657. It is not clear from the description in MNGP LRA whether certain categories or types of Class 1 and 2 piping components may have been excluded from the AMP as implemented at MNGP on the basis of RI-ISI. Please provide additional information in this regard:

Has RI-ISI been credited to exclude from inspections any categories or types of piping components that would otherwise be included in the inspections required by ASME Section XI 1995 Edition through the 1996 Addenda? If so, please identify the component categories or types and briefly discuss the justification for their exclusion.

NMC Response

In the MNGP License Renewal ASME Section XI AMP, the RI-ISI is not credited for excluding from inspection any categories or types of piping components that would otherwise be included as required by ASME Section XI 1995 Edition through the 1996 Addenda. Also, see the response to Audit Item B2.1.26-01.

L.2. NRC Audit Item B2.1.10-01

PDB/AMP-038 says that, "At MNGP, all IGSCC susceptible materials have been replaced or protected with a cladding of resistant weld material. Therefore, all piping welds are now classified as IGSCC Category A in accordance with NUREG-0313 and GL 88-01." In Section 3.10.B the PDB also says, "All piping welds are now classified as IGSCC Category A in accordance with NUREG-0313 and GL 88-01 and are being examined in accordance with the Risk Informed Inservice Inspection Program."

MNGP DBD-T12 (Design Basis Document: Plant Piping), Revision D, Section 2.3.23.B.2) identifies one of the corrective actions proposed in response to GL 88-01 as, "Inspect welds not meeting Category A requirements of NUREG-0313, Rev. 2, at each refueling outage and replace if crack indications are found or replace as a preventative measure during a future outage."

Question:

Since all IGSCC susceptible material has been replaced or protected with a cladding of resistant weld material, on what frequency are these welds now inspected? What is the technical and/or regulatory basis for that inspection frequency?

NMC Response

The BWR Stress Corrosion Cracking AMP is applicable to all BWR piping made of austenitic stainless steel that is 4 inches or larger in nominal diameter and contains reactor coolant at a temperature above 93°C (200°F) during power operation, regardless of code classification. GL 88-01 requires an augmented ASME Section XI ISI Program to inspect welds that are not classified as Category A. All piping welds at Monticello are now classified as IGSCC Category A in accordance with NUREG-0313 and GL 88-01 and the augmented ASME Section XI ISI inspection frequency of GL 88-01 no longer applies for any welds. Therefore, all piping welds are scheduled and being examined in accordance with the Risk Informed Inservice Inspection Program. Also, see the response to Audit Item B2.1.26-01.

L.3. NRC Audit Item B2.1.9-03

PDB/AMP-039 says that, "Code inspection are enhanced with inspections consistent with the requirements of BWRVIP-27 and BWRVIP-49 and an NRC approved alternative (RI-ISI)."

Question:

With regard to aging management of BWR Penetrations, please describe the effects on this program introduced by MNGP's implementation of RI-ISI.

NMC Response

RI-ISI reduced the number of welds being inspected for ASME Section XI, ISI, Examination Categories B-F and B-J. The welds were selected based on their susceptibility to aging mechanisms and the consequences of their failure rather than the ASME Section XI ISI required sample population. Also, see the response to Audit Item B2.1.26-01.

ENCLOSURE 1

Table 1 - NRC Audit Item B2.1.26-01: Alternatives to ASME Section XI, ISI Program Impact on Aging Management

The alternatives to ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, and ASME Section XI, Subsection IWF Programs discussed below will only be used during the fourth inspection interval, which ends May 31, 2012. The fourth inspection interval will end almost two years after entering the period of extended operation.

The alternatives of ASME Section XI, Subsections IWE Inservice Inspection Program and related alternatives will only be used during the first inspection interval, which ends prior to the period of extended operation on September 8, 2008. Therefore, none of the alternatives to ASME Section XI, Subsections IWE Inservice Inspection Program are considered to be aging management related or exceptions to NUREG-1801 that need to be justified from an aging management point of view, in accordance with 10 CFR 54.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
1. Risk Informed Inservice inspection Plan (Rev. 0)	Monticello has implemented a Risk Informed Inservice Inspection (RI-ISI) program for Class 1 and Class 2 piping welds in accordance with EPRI Topical Report TR-112657 Rev. B-A, Final Report, December 1999. The MNGP Level 1 and Level 2 Probabilistic Safety Assessment (PSA) results that are based on the January 1999 update was used to evaluate the consequences of pipe ruptures for the RI-ISI assessment during power operation. The base PSA Core Damage Frequency (CDF) is 1.5E-5 events per year and the base PSA Large Early Release Frequency (LERF) is 5.5E-7 events per year for the 1999 update. The original IPE result was a CDF of 2.6E-5, which was reported to the NRC in 1992. The consequence(s) of pressure boundary failures were evaluated and ranked based on their impact on core damage and containment performance (i.e., isolation, bypass and large early release). The impact on these measures due to both direct and indirect effects was considered using the guidance provided in EPRI TR-112657. The RI-ISI program has been conducted in accordance with Regulatory Guide 1.174 and the requirements of EPRI TR-112657, and the risk from implementation of	XI.M01-Yes XI.M07-No XI.M08-Yes	The RI-ISI program provides an alternative to the ASME Section XI, ISI requirements with regards to (1) the number of locations, (2) the locations of inspections, and (3) the method of inspection. The RI-ISI program maintains the fundamental requirements of ASME Section XI, such as the examination technique, examination frequency, and acceptance criteria. Although the RI-ISI program reduces the number of required examination locations, it maintains an acceptable level of quality and safety pursuant to 10CFR 50.55a(a)3, by focusing inspections on the most safety significant welds with nondestructive examination techniques that are more focused towards finding the type of expected degradation as well as the types of flaws and degradation found during traditional inspections. A systematic approach was used to identify component susceptibility to common degradation mechanisms and to categorize these degradation mechanisms into the appropriate degradation categories with respect to their potential to result in a postulated leak or rupture in the pressure boundary. An evaluation to determine the susceptibility of components to a particular degradation mechanism that may be a precursor to a leak or rupture in the pressure boundary, and an independent assessment of the consequences of a failure at that location were performed. Industry and plant-specific piping operating experience was used to identify piping degradation mechanisms and failure modes, and consequence evaluations performed using probabilistic risk assessments to establish safety ranking of piping segments for

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	this program is expected to remain neutral or decrease when compared to that estimated from current requirements.		selecting new inspection locations. The degradation mechanisms identified in the RI-ISI Program include thermal fatigue including thermal stratification, cycling and striping (TASCS) and thermal transients (TT), intergranular stress corrosion cracking (IGSCC), and flow accelerated corrosion (FAC). The consequences of pressure boundary failures were evaluated and ranked on their impact on core damage and early release. Therefore, redistributing the welds to be inspected with consideration of the safety significance of the segments provides assurance that segments whose failure have a significant impact on plant risk receive an acceptable and improved level of inspection. NUREG-1801, XI.M01 - ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD program, Element 4, "Detection of Aging Effects" states "Components are examined and tested as specified in Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1, respectively, for Class 1, 2, and 3 components. The tables specify the extent and schedule of the inspection and examination methods for the components of the pressure-retaining boundaries." Since this alternative provides a different number of locations, locations of inspections, and the method of inspections, it is considered an exception to NUREG-1801, XI.M01, Element 4. The RI-ISI examinations result in improved detection of service-related degradations over those currently required by ASME Section XI. Therefore, the aging effect cracking continues to be adequately managed for the piping welds.
2. Reactor Vessel Circum-ferential Welds (Rev. 1)	On November 10, 1998, the NRC issued Generic Letter 98-05 "Boiling Water Reactor Licensees Use of BWRVIP-05 Report to Request Relief From Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Welds." This generic letter permits licensees to request permanent relief from the in-service inspection requirements of 10 CFR 50.55a(g)(6) for the volumetric examination of circumferential reactor pressure vessel welds if it can be demonstrated that: (1) at the expiration of the	XI.M01-No XI.M04-No	Circumferential weld examination relief analysis meets the requirements of 10CFR54.3(a). As such, it has been included as a TLAA (See LRA Section 4.2.6).

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	license, the circumferential welds will continue to satisfy the limiting conditional failure probability for circumferential welds in the staff's July 28, 1998, safety evaluation, and (2) operator training and procedures limit the frequency of cold over-pressure events to the amount specified in the staff's July 28, 1998, safety evaluation. MNGP has received inspection relief for the circumferential welds for the current operating term (NRC Letter, Monticello Nuclear Generating Plant – Approval of Relief Request Number 12 of the Third 10 Year Inservice Inspection Program, (TAC No. MB02061), July 27, 2001).		
3. Appendix VIII Supplement 4 (Rev. 0)	The 10 CFR 50.55a Final Rule was amended by Federal Register Notice (66FR16391) dated March 26, 2001. This amendment specified the use of a flaw length sizing tolerance criterion of 0.75 inch Root Mean Square (RMS) for reactor vessel qualification to be used in conjunction with the 0.15 inch RMS for depth sizing specified in the Rule in lieu of paragraphs 3.2(a) and 3.2(b) in ASME Section XI, Supplement 4 to Appendix VIII. In the Notice, there was no reference to the elimination of the statistical parameters of Paragraph 3.2(c), which were intended for use with paragraphs 3.2(a) and 3.2(b) of Appendix VIII, Supplement 4. There was no amendment statement included to reflect the use of the RMS error calculations for depth and length sizing in lieu of Paragraph 3.2(c). In a public meeting on October 11, 2000 at NRC offices in White Flint, MD, the EPRI Performance Demonstration Initiative (PDI) identified the discrepancy between the PDI Program and statistical parameters required by Subparagraph 3.2(c). The Staff agreed that the inclusion of the statistical parameters of Paragraph 3.2(c) of Supplement 4 to	XI.M01-No XI.M09-No	This activity is associated with the performance demonstration of the ultrasonic examination system for the reactor vessel. The activity will have no bearing on management of the aging effect for the reactor vessel welds. This alternative is not an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	Appendix VIII was an oversight. The NRC agreed that Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) should have excluded Subparagraph 3.2(c) as a requirement. In Subparagraph 3.2(c), the linear regression line is the difference between measured versus true value plotted along a through-wall thickness. For Supplement 4 performance demonstrations, a linear regression line of the data is not applicable because the performance demonstrations are performed on test specimens with flaws located in the inner 15% through-wall. The difference between measured versus true value produce a tight grouping of results that resemble a shotgun pattern. The slope of a regression line from such data is extremely sensitive to small variations, thus making the parameter of Subparagraph 3.2(c)(1) a poor and inappropriate acceptance criterion. The value used in the 3.2(c)(2) is too lax with respect to evaluating flaw depths within the inner 15% of wall thickness. Therefore, NMC proposes to use for the MNGP the more appropriate criterion of 0.15 inch RMS c 10 CFR 50.55a(b)(2)(xv)(C)(1), which modifies Subparagraph 3.2(a) as the acceptance criteria. Subparagraph 3.2(c)(3) pertains to a correlation coefficient. This value of correlation coefficient is inappropriate for this application since it is based on the linear regression from Subparagraph 3.2(c)(1).		
4. Reactor Vessel Stabilizer Brackets (Rev. 0)	Four RPV stabilizer brackets are attached to the Class 1 RPV with full penetration fillet welds at 0°, 90°, 180°, and 270° RPV azimuth at an elevation of 994'-2". The RPV stabilizers are connected with flexible couplings to the brackets on the RPV and also to the biological shield wall. The RPV stabilizers, brackets, and their attachment welds are designed to withstand and resist local loads (jet reaction forces) and seismic loads while	XI.M01-Yes XI.S03-No	NUREG 1801, XI.M1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, credits the ASME Section XI, Table IWB-2500-1, Examination Category B-H, for aging management of integral attachments for vessels (Note that NUREG-1801 incorrectly identifies this exam category as B-H, it should be Exam Category B-K). Therefore, this is considered an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	allowing axial and radial movement due to normal thermal growth. The RPV stabilizer brackets do not provide structural support during normal operation. The MNGP RPV has never experienced jet reaction forces or seismic events, therefore the stabilizers, brackets, and attachment welds have not experienced the loads for which they are designed. The MNGP Mark I primary containment structure, or drywell, is shaped somewhat like an upside-down light bulb. The RPV stabilizer brackets are located in the higher, necked-down elevations of the drywell. This region of the drywell is a very limited access area; it was not designed with the intention of providing access and accommodations normally considered necessary for a general work area. The area around the stabilizers is extremely congested. The vessel stabilizer brackets are surrounded by mirror insulation that is secured by cable hangers and buckles, ventilation ductwork with support bracing, and electrical installations such as thermocouples. All of this equipment must be relocated and restored to provide access to the stabilizers for examination of the welds. Additionally, due to the location of the stabilizer brackets and the lack of a working platform at the stabilizer location a complex scaffold installation is required to provide access to the examination location. As an alternative to the requirements of the ASME Section XI Code, Table IWB-2500-1, Category B-K, Item B10.10, MNGP proposed to perform a surface examination on the stabilizer brackets if local (jet reaction forces) or seismic design loads are experienced. In addition, a one time VT-3 visual inspection of the accessible areas of all four of the welded attachments		The section of the RPV stabilizer bracket discussed is not part of the NUREG-1801, XI.S3 ASME Section XI, Subsection IWF Program and is therefore not considered an exception for this aging management program. A release from this inspection will have no effect on aging management of the components in scope crediting these programs. The welds are part of the external surface of the reactor vessel. Aging management for the vessel external surface is discussed in the LRA Table 3.1.2-2 "Reactor Coolant System - Reactor Pressure Vessel," Page 3-51. In addition, a VT-3 visual inspection of the accessible areas of all four of the welded attachments was performed during the refueling outage that occurred in 2005 with no reportable conditions noted.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	were performed during the refueling outage that occurred in 2005 with no reportable conditions noted.		
5. Leakage at Bolted Control Rod Drive (CRD) Housing Connections (Rev. 0)	The CRD (Control Rod Drive) housings are flanged connections beneath the reactor vessel that are used to secure the 121 CRD mechanisms in position below the vessel. Each of the 121 CRD to CRD housing bolted joints utilizes eight bolts, washers, and nuts to hold the CRD mechanism in position. The joint also utilizes three hollow metal O-rings to provide a watertight seal capable of withstanding full reactor pressure at normal operating temperatures. The CRD housing joints are VT-2 examined as part of the periodic Reactor Pressure Vessel Leakage and Hydrostatic pressure tests. These tests are conducted with the vessel temperature much less than the design operating temperature. For a typical test, the vessel temperature would be <212° F, as compared to a normal operating temperature of about 540° F. It is not unusual for these bolted joints to leak slightly during periodic reactor vessel pressure tests conducted at test temperatures below normal operating temperature. This is a condition identified in the original design of the connection by the Architect/Engineer, General Electric (GE). GE developed guidance to permit evaluation of a leaking CRD housing bolted connection over a period of time, while at test pressure, to determine whether the leak will stop once the vessel heats up to normal operating pressure. This leakage evaluation criterion is incorporated into the VT-2 tests for these joints. It was proposed that if any leakage was found at a CRD housing bolted joint during a periodic pressure test performed at a temperature much less than operating temperature it will be evaluated to determine	XI.M01-No XI.M18-No	This alternative involves corrective actions for leakage identified at bolted connections and has no bearing on the aging management of the components within the scope of license renewal. The CRD housing joint continues to be pressure tested and visually inspected. Leakage of the mechanical joint itself would not be a concern for maintaining the pressure boundary intended function for license renewal as it would not necessarily be an indication of aging. The aging management of the long-lived passive components, which comprise the joint, has not changed. This is not an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	whether it will stop leaking at operating temperature. If this evaluation shows the leak will stop as temperature increases to normal operating temperature, no further action will be taken. The acceptance criteria are based on guidance provided by General Electric and are included in the VT-2 tests for the joint. If the leakage is determined to be unacceptable according to the General Electric guidelines and the joint is disassembled to correct the leak, any CRD bolting that is reused will be examined by the VT-1 examination method. MNGP committed to revise the applicable pressure test procedure to perform a VT-1 exam in lieu of a VT-3 exam specified by IWA-5250(a)(2) on all CRD bolting that will be reused when the GE acceptance criteria has been exceeded and disassembly is required to correct the leak.		
6. Appendix VII Annual Training (Rev. 0)	ASME Section XI, 1995 Edition, 1996 Addenda, Mandatory Appendix VII, Paragraph VII-4240 requires supplemental training on an annual basis to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the Employer. The extent of this training shall be a minimum of 10 hours per year. A record of attendance and the topics covered during the training shall be maintained; however, no examination is required. 10 CFR 50.55a, paragraph (b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility. 10 CFR 50.55a was amended in the Federal Register	XI.M01-No XI.S03-No	The training of the individuals performing ultrasonic examination is not discussed in NUREG 1801, XI.M1,.ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, or XI.S3 ASME Section XI, Subsection IWF. This activity is administrative in nature and has no effect on the aging management of components within the scope of license renewal. This alternative does not affect the ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD or ASME Section XI, Subsection IWF program inspection scope, schedule or acceptance criteria. This is not an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	(Volume 64, No. 183 dated September 22, 1999) to require Appendix VIII – Supplements for accelerated implementation in accordance with ASME Section XI 1995 Edition, 1996 Addenda. MNGP proposed to use the more rigorous and detailed annual training requirements of 10 CFR 50.55a(b)(2)(xiv) in lieu of annual training requirements Appendix VII, paragraph VII-4240. MNGP further proposed that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII - Supplements ASME Section XI, 1995 Edition, 1996 Addenda shall receive 8 hours of annual hands-on training on specimens that contain cracks or by analyzing prerecorded data from material or welds that contain cracks. This training will be completed no earlier than 6 months prior to performing ultrasonic examinations.		
7. Use of 2001 Edition for Repair/ Replacement Program (Rev. 0)	MNGP proposes to use the 2001 Edition of Section XI in lieu of the 1995 Edition with the 1996 Addenda for repair/replacement activities. The 2001 Edition has subsequently been approved in the latest version of 10CFR50.55a. There is one limitation that was identified for the MNGP and that was to implement paragraph IWA-4540(c) of the 1998 edition in lieu of that of the 2001 edition when implementing the 2001 edition of ASME Code, Section XI, Article IWX-4000 for repair and replacement activities. ASME Section XI 1995 Edition with the 1996 Addenda with Articles IWX-4000 provides the rules and requirements for repair/replacement activities associated with pressure retaining components and their supports, including appurtenances, subassemblies, parts of a component, core support structures, metal containments and their integral	XI.M1-Yes XI.M3-Yes XI.M4-Yes XI.M5-Yes XI.M6-Yes XI.M7-Yes XI.M13-Yes XI.M18-Yes XI.S03-No	This alternative allows the use of the 2001 Edition of ASME Section XI in lieu of the 1995 Edition with the 1996 Addenda for repair/replacement activities. The 2001 Edition has subsequently been approved in the latest version of 10CFR50.55a. The following was published in the Federal Register / Volume 67, No. 187 / Thursday, September 26, 2002 / Rules and Regulations: "Accordingly, an applicant may use Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI of the ASME BPV Code (1997 Addenda, 1998 Edition, 1999 Addenda, and 2000 Addenda) as acceptable alternatives to the requirements of the 1995 Edition up to and including the 1996 Addenda of the ASME Code, Section XI, referenced in the GALL AMPs without the need to submit these alternatives for NRC review in its plant-specific license renewal application."

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	attachments, and metallic portions of Class CC containments and their integral attachments. Section XI editions and addenda after the 1996 Addenda made several changes to Articles IWX-4000. Very few of these changes were technical in nature. Instead, the changes restructured some of the requirements, (i.e. Combined IWX-4000 and IWX-7000 into one section) clarified others that were difficult to interpret, and eliminated redundant requirements. Of the actual technical changes made, these changes either added enhancements to the program or added requirements not applicable to Monticello. To enhance the repair/replacement program, MNGP requested to use the 2001 Edition of ASME Section XI to govern repair/replacement activities for all Class 1, 2, 3, and MC pressure retaining components and their supports, in lieu of the 1996 Addenda for Class 1, 2, 3 components, and the 1992 Addenda for Class MC components.		"The new limitations and modifications in 10 CFR 50.55a(b) require that the revised provisions be supplemented with additional inspection requirements as a condition for their use. The conclusions of the GALL report remain valid for the 1997 Addenda, 1998 Edition, 1999 Addenda, and 2000 Addenda of Section XI of the BPV Code with the use of these new limitations and modifications as discussed in this final rulemaking." This alternative has already been generically reviewed and approved by the NRC staff for aging management of systems and components within the scope of license renewal. Therefore, this alternative will not effect the aging management of components crediting ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD or ASME Section XI, Subsection IWF. NUREG-1801, XI.M01, Element 7, Corrective Actions, states " For Class 1, 2, and 3, respectively, repair is in conformance with IWB-4000, IWC-4000, and IWD-4000, and replacement according to IWB-7000, IWC-7000, and IWD-7000." And the Program Description states, "Inspection, repair, and replacement of these components are covered in Subsections IWB, IWC, and IWD, respectively, in the 1995 edition through the 1996 addenda." Since this alternative allows the use the 2001 Edition of Section XI in lieu of the 1995 Edition with the 1996 Addenda for repair/replacement activities it is considered an exception to NUREG-1801.
8. One-Time Relief, Class 1 Pressure Test at Less Than System Operating Pressure (Rev. 0)	MNGP completed a previous refueling outage on May 26, 2003. During the refueling outage, MNGP completed the system leakage test required by American Society of Mechanical Engineers (ASME) Section XI, Table IWB-2500-1, Category B-P, Item 15.10 and 10 CFR Part 50 Appendix G, Section IV.A.2.d. Following restart of the unit, the "B" and "G" main steam safety relief valve assemblies (SRVs) indicated leakage, as determined by higher than normal temperatures in their respective discharge tailpipes.	XI.M01-No	The LRA does not credit the MNGP License Renewal ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program for aging management of the SRV assemblies. Therefore, this is not an exception to NUREG-1801. In addition, the activities associated with this alternative have been completed and this activity will not be included in the extended license period.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	MNGP decided to conduct a planned unit shutdown and enter a maintenance outage to replace the affected SRV assemblies. The SRV assemblies are connected to the main steam piping with a bolted, mechanical joint. Replacing them for maintenance was considered a Repair-Replacement activity under the rules of ASME Section XI, 1995 Edition with the 1996 Addenda which was the current code of record for the 4th 10-Year ISI Interval prior to NRC approval of Relief Request No. 7. Following repair-replacement, a system leakage test was required by IWA-4540(c). The system leakage test at the nominal pressure associated with the reactor at 100% power would be approximately 1000 psig. MNGP proposed to perform a VT-2 examination on the mechanical joints of the SRV assemblies during the normal operational start-up sequence at a minimum of 900 psig following a 10 minute hold time (for uninsulated components) in lieu of the nominal operating pressure associated with 100% reactor power of approximately 1000 psig.		
9. Use of Alternative Require-ments for Appendix VIII, Supplement 10, as Imple-mented by PDI (Rev. 0)	Class 1 and 2 dissimilar metal pressure retaining piping welds subject to UT examination are also subject to using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 10. Relief was requested to use alternative requirements for implementation of Appendix VIII, Supplement 10 that was in accordance with the EPRI Performance Demonstration Initiative (PDI) Program.	XI.M01-No	ASME Section XI, Appendix VIII, Supplement 10 contains the qualification requirements for procedures, equipment, and personnel involved with examining dissimilar metal welds using ultrasonic techniques. This activity is associated with the performance demonstration of the ultrasonic examination. This alternative does not affect the ISI program's inspection scope, schedule or acceptance criteria, and is not related to aging management. This is not an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
10. Use of Code Case N-613-1 (Rev. 0)	MNGP is required to perform Inservice examinations of selected reactor vessel nozzle-to-vessel welds in accordance with the requirements of 10 CFR 50.55a, and the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components. Table IWB-2500-1, Examination Category B-D, Item No. B3.90 specifies the examination requirements. Figure IWB-2500-7(b) requires that a minimum volume of material, a distance of ts/2 (one half the reactor vessel shell thickness) adjacent to the weld, be examined. The required examination volume for the reactor vessel pressure retaining nozzle-to-vessel welds extends far beyond the weld into the base metal, and is unnecessarily large. The proposed alternative re-defined the examination volume boundary to 1/2 inch of base metal on each side of the widest portion of the weld, removing from examination the base metal that was extensively examined during prior inspections, and is not in the high residual stress region associated with the weld. MNGP proposed the alternative described in the ASME Boiler and Pressure Vessel Code Section XI Code Case N-613-1 in lieu of the ASME Section XI Table IWB-2500-1 Examination Category B3.90 requirements. The creation of flaws during plant service in the volume excluded from the proposed reduced examination was unlikely because of the low stress in the base metal away from the weld. The stresses caused by welding are concentrated at or near the weld. Cracks, should they initiate, occur in the high-stressed areas of the weld. These high stress areas are contained in the volume that is defined by Code Case N-613-1 and are	XI.M01-Yes XI.M08-Yes XI.M18-No	This activity alters the examination volume boundary for the reactor vessel pressure retaining nozzle-to-vessel welds, however, the aging effect continues to be managed. NUREG-1801, XI.M01 - ASME Section XI In-Service Inspection, Subsections IWB, IWC, and IWD program, Element 4, "Detection of Aging Effects" states, "Examination category B-D, for full penetration welds of nozzles in reactor vessels, pressurizers, steam generators (primary side), and heat exchangers (primary side): This category specifies volumetric examination of all nozzle-to-vessel welds and the nozzle inside radius." XI.M8 BWR Penetrations also discusses Examination Category B-D in element 4. Therefore, this is considered an exception to NUREG-1801. (Note that NUREG-1801, XI.M18 Bolting Integrity Program references Examination Category B-D, however, this is in error. Examination category C-D should have been referenced.)

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	thus subject to examination. During previous examinations, no indications exceeding the allowable limits of the preservice or Inservice criteria were found in the reactor vessel nozzle to shell examination volumes including the base metal areas proposed for exclusion from examination in this request. The use of Code Case N-613-1 was requested until the NRC publishes the Code Case in a future revision of Regulatory Guide 1.147.		
11. Use of Code Case N-661 (Rev. 0)	MNGP proposed to implement the requirements of ASME Code Case N-661 as an alternative for Class 2 and 3 raw water piping systems resulting from degradation mechanisms such as erosion, corrosion, cavitation, or pitting as an approach to managing aging of these systems. These types of defects are typically identified by small leaks in the piping system or by pre-emptive non-code required examinations performed to monitor the degradation mechanisms. The repair technique described in Code Case N-661 involves the application of additional weld metal on the exterior of the piping system that restores the wall thickness requirement. This repair technique is utilized whenever engineering evaluation determines that such a repair is suitable for the particular defect or degradation being resolved. Provisions for implementation of this Code Case require that adjacent areas be examined to verify that the repair will encompass the entire flawed area and that no other unacceptable degraded locations exist within the representative area. This will be dependent on the degradation mechanism present. An evaluation of the degradation will be performed to determine the	XI.M01-No	The LRA does not credit the MNGP License Renewal ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program for aging management of the Class 2 and 3 raw water piping. Therefore, this is not an exception to NUREG-1801.

Alternative	Discussion	Impact to AMP	Aging Management Discussion
	re-examination schedule to be conducted over the life of the repair. The repair will be considered to have a maximum service life of two fuel cycles unless the re-examinations conducted during each of the two fuel cycles establish the expected life of the repair. Additionally, MNGP will implement the following restrictions to ensure that the use of the Code Case will provide an acceptable method for managing aging effects: (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, and (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.		

Table 2 - NRC Audit Item B2.1.26-01: ASME Section XI, ISI Program, Regulatory Guide 1.147 Code Case Impact on Aging Management

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, and ASME Section XI, Subsection IWF code cases discussed below will only be used during the fourth inspection interval, which ends May 31, 2012. The fourth inspection interval will end twenty-one months after entering the period of extended operation.

The code cases of ASME Section XI, Subsections IWE Inservice Inspection Program and related code cases will only be used during the first inspection interval, which ends prior to the period of extended operation on September 8, 2008. Therefore, none of the code cases involving the ASME Section XI, Subsections IWE Inservice Inspection Program are considered to be aging management related or exceptions to NUREG-1801 that need to be justified from an aging management point of view, in accordance with 10 CFR 54.

The following listed Code Cases are permissible for use at Monticello during the fourth Interval per Regulatory Guide 1.147, Revision 13. The codes were evaluated for their potential impact on aging management.

Code Case	Discussion	Impact to AMP	Aging Management Discussion
N-307-2	Revised Ultrasonic Examination Volume for Class I Bolting, Table IWB-2500-1, Examination Category B-G-1, When the examinations are conducted from the end of the bolt or stud, or from the center-drilled hole	XI.M01-Yes XI.M03-Yes XI.M18-No	This Case eliminates the examination of the center bore hole surface by allowing a surface examination of the OD surface or a volumetric examination of a cylindrical region 1/4 inch thick measured from the minor diameter of the bolt or stud. The provisions of this Case were added to Table IWB-2500-1, Fig. IWB-2500-12, and Appendix VIII Supplement 8 1.1(c) in the 2000 Addenda. The only bolts with center holes are the reactor head closure studs and reactor recirc pump bolts. This Code case changes the portion of the bolt being evaluated but still would identify the presence of the relevant aging effect. Therefore, there is no impact on aging management. Table IWB-2500-1, Examination Category B-G-1 is referenced in NUREG-1801, XI.M01, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD and XI.M03 Reactor Head Closure Studs and is therefore this alternative is considered an exception to NUREG-1801.
N-460	Alternative examination coverage for Class 1 and Class 2 welds, Section XI, Division 1	XI.M01-No	This Case provides alternative rules for reduced examination of Class 1 and 2 welds when the entire examination volume or area cannot be examined due to interference from another component or part. (Reduction is limited to 10% or 90% coverage). ASME Section XI - 1995 Edition through 1996 Addenda, Examination Category B-A, Item B1.40, requires volumetric and surface examination, as defined by Figure IWB-2500-5, of essentially 100 percent of the weld length of the reactor pressure vessel (RPV) closure head-to-flange weld. "Essentially 100 percent," as clarified by ASME Code Case N-460, is greater than 90 percent coverage of the examination volume, or surface area, as applicable. The welds continue to be inspected, and therefore there is no impact on aging management. ASME Section XI, ISI, Examination Category B-A is not referenced in NUREG-1801; therefore this is not considered an

Code Case	Discussion	Impact to AMP	Aging Management Discussion
			exception.
N-491-2	Rules for Examination of Class 1, 2, 3, and MC Component Supports of Light-Water Cooled Power Plants, Section XI, Division 1 (not used for scheduling—used for evaluation provisions on an as-needed basis)	XI.S03-Yes XI.M01-No	This revision clarifies that corrective measures may be performed on a component support to return the support to its design condition after acceptance by evaluation or test, without requiring additional examinations. These provisions were added to IWF-3112.3 and IWF-3122.3 in the 1997 Addenda. Most of the provisions of the original Case were added in the 1990 Addenda. The original Case provided an alternative to the provisions of Section XI regarding examination requirements for Class 1, 2, 3, and MC component supports as well as an alternative to the inspection program in Section XI. This case involves corrective actions of component supports and would have no impact on the aging management of the supports. NUREG-1801, XI.S03, ASME Section XI, Subsection IWF, Element 7, Corrective Actions, states, " In accordance with IWF-3122, supports containing unacceptable conditions are evaluated or tested, or corrected before returning to service. Corrective actions are delineated in IWF-3122.2. IWF-3122.3 provides an alternative for evaluation or testing, to substantiate structural integrity and/or functionality." Therefore, this alternative is considered an exception to NUREG-1801.
N-498-4	Alternate Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems. (Applicable to Class 3, Category D-B only)	XI.M01-No	This Case permits use of the system leakage test as an alternative to the system hydrostatic test during each 10-year inspection interval for Class 3, Category D-B only. This revision clarifies that the pressure test is not to be less than the pressure corresponding with 100% of the rated reactor power. The Case may be used in lieu of the test required by Table IWB-2500-1, Category B-P, and Table IWC-2500-1, Category C-H. The provisions of this Case for Class 1 and 2 Systems were added in the 1993 Addenda. The objective of ASME Section XI ISI Program is to identify conditions (e.g., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. Therefore, leakage tests alone are not completely adequate, as they would only demonstrate that the component has failed to be managed for aging. An alternative to the test pressure used in the leakage test would have no impact on aging management. In addition, the LRA does not credit the MNGP License Renewal ASME Section XI ISI Program for aging management of Class 3 components. Therefore, this is not considered an exception to NUREG-1801.
N-504-2	Alternate Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping	XI.M01-No XI.M07-No	This revision modifies and clarifies the applicability of IWX-4000 for defect removal. The changes were necessary to be consistent with recent changes to ASME Section XI. Based on interpretation XI-1-92-59, it is not necessary to use this code case as the code already allows the provisions of the code case. This case involves corrective actions and is administrative in nature; therefore, this Case would have no impact on the aging management of the stainless steel piping. This is not an exception to NUREG-1801.

Code Case	Discussion	Impact to AMP	Aging Management Discussion
N-513	Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping	XI.M01-No	This Case provides for the temporary acceptance of flaws, including through-wall (leaking) flaws in low and moderate energy Class 3 piping providing that the condition of the case is satisfied. Acceptance criteria are based on the same margins as contained in Appendices C and H and Case N-450. The LRA does not credit the MNGP License Renewal ASME Section XI ISI Program for aging management of Class 3 piping; therefore, this alternative is not considered an exception to NUREG-1801.
N-517-1	Quality Assurance Program Requirements for Owners	XI.M01-No	This revision updates paragraph references to NCA-3800 of Section III, and IWA-4000 and IWA-7000 of Section XI and uses the new Section III term, "Material Organization" instead of "Materials Suppliers" and "Material Manufacturers." The original Case permits Owners to perform some of the activities that Section III limits to Certificate Holders only. The Owner may use these provisions without possessing a Certificate of Authorization. There are no technical changes in this revision. This Case is administrative in nature and therefore there is no impact on aging management. This alternative is not considered an exception to NUREG-1801.
N-522	Pressure Testing of Containment Penetration Piping (applies to subset of Class 2 piping only)	XI.M01-No	This Case provides an alternative to the rules of Table IWC-2500-1, Category C-H, for pressure testing piping that penetrates the containment vessel, when the piping and isolation valves that are part of the containment system are Class 2 and the balance of the piping system is outside the scope of Section XI. The provisions of the Case were added to IWA-5110(c) in the 1997 Addenda to Section XI. The LRA does not credit the MNGP License Renewal ASME Section XI ISI Program for aging management of Class 2 piping, when the piping and isolation valves are part of the containment system, therefore this alternative is not considered an exception to NUREG-1801.
N-526	Alternative Requirements for Successive Inspections of Class 1 and 2 Vessels	XI.M01-Yes	This Case provides alternative requirements to be used for successive inspections required by IWB-2420 and IWC-2420, when areas of the vessel are found, by volumetric examinations, to contain subsurface flaws. The successive inspections may be waived when the flaw is found to be acceptable for continued service in accordance with IWB-3600. The vessel aging effects continue to be managed and the flaws are still required to be acceptable for continued service therefore there is no impact on aging management of the vessel. NUREG-1801, XI.M01, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD, Element 5, Monitoring and Trending, states " For Class 1, 2, or 3 components, the inspection schedule of IWB-2400, IWC-2400, or IWD-2400, respectively, and the extent and frequency of IWB-2500-1, IWC-2500-1, or IWD-2500-1, respectively, provides for timely detection of degradation. The sequence of component examinations established during the first inspection interval is repeated during each successive inspection interval, to the extent practical." Therefore, this alternative is considered an exception to NUREG-1801.

Code Case	Discussion	Impact to AMP	Aging Management Discussion
N-528-1	Purchase, Exchange, or Transfer of Material Between Nuclear Plant Sites	XI.M01-No	This revision merely changes references to be consistent with the paragraph renumbering that took place in the 1995 Addenda to Section XI. The original Case permitted transfer between Owners, of Code materials, parts, and Code-stamped items that have not been placed in service. These provisions are needed only for NA-3700/NCA-3800 applications. This is an administrative change and has no impact on aging management. This alternative is not considered an exception to NUREG-1801.
N-532-1	Alternate Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000	XI.M01-No	The Case was revised to correct paragraph references required as a result of combining IWA-4000 and IWA-7000 in the 1991 Addenda. The original Case provided an alternative to completion of NIS-1 and NIS-2 Data Reports. The alternative reports are submitted following each inspection period instead of each refueling outage. A standard format for report content is given. Class 3 systems are required to be included when this Case is used. This case only affects documentation and reporting requirements. This case is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. This alternative is not considered an exception to NUREG-1801.
N-534	Alternative Requirements for Pneumatic Pressure Testing	XI.M01-No	This Case permits use of normal operating pressure for Class 2 and 3 pneumatic tests, in lieu of the hydrostatic test pressure. The provisions of the Case were added to IWC-5230 and IWD-5222 in the 1998 Addenda to Section XI. The objective of ASME Section XI ISI Program is to identify conditions (e.g., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. Therefore, hydrostatic test tests alone are not completely adequate, as they would only demonstrate that the component has failed to be managed for aging. An alternative to the test pressure used in the leakage test would have no impact on aging management. The LRA does not credit the MNGP License Renewal ASME Section XI ISI Program for Class 2 and 3 pneumatic tests; therefore, this alternative is not considered an exception to NUREG-1801.
N-537	Location of Ultrasonic Depth Sizing Flaws	XI.M01-No	This Case permits 'regional' identification of all flaw locations in the test specimen for Appendix VIII flaw depth sizing tests, rather than 'specific' location identification for most flaws and 'regional' identification for the remainder. Use of this Case does not affect the validity of the test, because the candidate must always report his maximum measurement as the flaw depth. This case involves test specimens and therefore has no impact on the aging management of systems and components in scope for license renewal. This is not considered an exception to NUREG-1801.

Code Case	Discussion	Impact to AMP	Aging Management Discussion
N-545	Alternative Requirements for Conduct of Performance Demonstration Detection Test of Reactor Vessel	XI.M01-No	Appendix VIII, Supplements 4, 5, 6, and 7 require that, in a performance demonstration, a flaw be reported within 1/2 in. of its true location (x and y) to be considered detected. This Case provides more liberal location tolerances for the performance demonstration test. These tolerances account for location error that may be introduced by permissible calibration tolerances. This case involves performance demonstration detection tests and has no impact on the aging management of systems and components in scope for license renewal. This is not considered an exception to NUREG-1801.
N-546	Alternative Requirements for Qualification of VT-2 Examination Personnel	XI.M01-No	This Case provides alternative qualification requirements for VT-2 visual examination personnel.. These provisions permit easier qualification of plant operators and engineers to perform system leak test examinations during normal system walkdown, rather than requiring use of separate QA/QC personnel. The provisions of this Case were added to IWA-2316 in the 1998 Edition. This Case allows qualification of examination personnel by test to demonstrate knowledge of Section XI and plant specific procedures for VT-2 visual examination, and to requalify examination personnel by examination every three years. This code case is applicable only to the performance of VT-2 examinations and may not be applied to other VT-2 functions such as verifying the adequacy of procedures and training VT-2 personnel. This alternative in personnel qualification requirements has no impact on the aging management of systems and components in scope for license renewal. This is not considered an exception to NUREG-1801.
N-552	Alternative Methods—Qualification for Nozzle Inside Radius Section from the Outside Surface	XI.M01-No XI.M05-No XI.M06-No	This Case provides for use of computer models to reduce the number of required mockups and performance demonstrations for examination of the nozzle inside radius section from the outside surface. This case involves performance demonstration detection tests and has no impact on the aging management of systems and components in scope for license renewal. This alternative is not considered an exception to NUREG-1801.
N-555	Use of Section II, V, and IX Code Cases	XI.M01-No	IWA-2440 provides for use of Section XI Code Cases, but not Cases for Sections II, V, and IX. This Case identifies that the following Cases may be used for Section XI work: Cases 2143, 2142, 2141-1, 2108, 2107, 2096, 2095, 2094, 2082, 2022-1, 1870, and 1852. This case is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. This alternative is not considered an exception to NUREG-1801.
N-566-1	Correction Action for Leakage Identified at Bolted Connections (SBLC System only)	XI.M01-No XI.M18-No	This revision adds details for performing the evaluation of leakage identified at bolted connections. The original Case permitted evaluation of bolted joints with leakage, in lieu of removing one or more of the bolts for visual examination in accordance with ASME Section XI IWA-5250(a)(2). Article IWA-5250(a)(2) requires one of the bolts be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA 3100 if leakage occurs at a bolted connection. IWA-5250(a)(2) requires the bolt that is closest to the source of leakage be selected for removal. In lieu of these requirements, an attempt is made to stop the

Code Case	Discussion	Impact to AMP	Aging Management Discussion
			leakage and an evaluation of the susceptibility of the bolting to corrosion and failure is performed. ASME Code Case N-566-1 requires that the leakage be stopped and the joint integrity be reviewed. If the leakage is not stopped, the joint is evaluated in accordance with IWB-3142.4 for joint integrity, which relies on an analytical evaluation of a component containing relevant conditions for continued service. The evaluation for the specific case would consider the number and service age of the bolts, bolt and component material, corrosiveness of process fluid, leakage location and system function, leakage history at the connection or other components, and visual evidence of corrosion at the assembled connection. This allows a systematic approach and sound engineering judgment, provided that as a minimum, all of the evaluation factors listed in the code case are considered. Therefore, the use of Code Case N-566-1 provides an acceptable level of quality and safety for Class 1 , 2, and 3 pressure retaining bolted connections and the aging management of the bolts and joints is not impacted. This case involves corrective actions for leakage identified at bolted connections and has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-586	Alternative Additional Examination Requirements for Class 1, 2, and 3 Piping, Components, and Supports	XI.M01-No	This Case provides alternatives to IWB-2430(a), IWC-2430(a), IWD-2430(a), and IWF-2430(a) for additional examinations. The Case requires a root cause evaluation and additional examinations of items subject to the same root cause conditions and degradation mechanisms, rather than a sampling approach. This case varies the approach to additional examinations to better target other potential indications and therefore has no impact on aging management of systems and components in the scope of license renewal. This is not an exception to NUREG-1801.
N-592	ASNT Central Certification Program	XI.M01-No	This Case provides that the ASNT Central Certification Program (ACCP) may be used as alternative to the personnel examination requirements of IWA-2300. The ACCP certificate is applicable for Levels I, II, and III NDE personnel. The provisions of the Case were added to IWA-2310, IWA-2313, IWA-2314, and IWA-2323(i) in the 1999 Addenda to Section XI. This case is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-597-1	Requirements for Analytical Evaluation of Pipe Wall Thinning	XI.M01-No XI.M17-No	This revision permits the Case to be used for materials other than carbon and low alloy steels, and its use is no longer restricted to wall thinning caused by flow-accelerated corrosion or other corrosion phenomena. Further, -3623.1 is changed to clarify that the multiplying factor of 1.143 on allowable stresses may be used in the wall thinning evaluation only when the piping design stress analysis was based on the nominal piping wall thickness, and the stress analysis in the wall thinning evaluation is based on the predicted wall thickness t_p. The original Case addressed evaluation criteria for flow-accelerated-thinning and other corrosion phenomenon. This Case is intended to replace Case N-480, which contains programmatic

Code Case	Discussion	Impact to AMP	Aging Management Discussion
			requirements that are no longer current. The LRA does not credit the MNGP License Renewal ASME Section XI ISI program for managing loss of material or wall thinning and therefore, this is not an exception to NUREG-1801. This Code Case must be supplemented by the provisions of EPRI Nuclear Safety Analysis Center Report 202L-R2, April 1999, "Recommendations for an Effective Flow Accelerated Corrosion Program," for developing the inspection requirements, the method of predicting the rate of wall thickness loss, and the value of the predicted remaining wall thickness. Therefore, there is no impact on the Flow-Accelerated Corrosion Program.
N-598	Alternative Requirements to Required Percentages of Examinations (Applied to exam categories in Tables IWB-2412-1, IWC-2412-1, IWD-2412-1, IWE-2412-1, and IWF-2410-2 with exceptions noted in Subparagraph (a))	XI.M01-No	This Case provides an alternative to the Inspection Program B Tables in order to eliminate redundancy and provide more flexibility for scheduling inspections. This is achieved by increasing the percentages for "Maximum Examinations Credited" in the Tables. The provisions of the Case were added to Table IWB-2412-1, Table IWC-2412-1, Table IWD-2412-1, Table IWE-2412-1, and Table IWF-2410-2 in the 1998 Edition of Section XI. This is applicable to XI.M01, ASME Section XI, ISI, XI.S01, ASME Section XI, Subsection IWE, and XI.S03, ASME Section XI, Subsection IWF. This case is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-601	Extent of Frequency of VT-3 Visual Examination for Inservice Inspection of Metal Containments (Applied to IWE Program, approved for use per Relief Request MC-7)	XI.M01-No	This Case permits the VT-3 visual examination for examination Category E-A, containment surfaces, to be performed anytime during the interval, instead of at the end of the interval, provided the requirements for successive inspections in IWE-2420 are met. The provisions of this Case were added to Table IWE-2500-1, Category E-A in the 1998 Edition. This case alters the inspection schedule and therefore has no bearing on the aging management of the containment. The code cases of ASME Section XI, Subsections IWE Program will only be used during the first inspection interval, which ends prior to the period of extended operation. Therefore, this code case is not considered to be aging management related. This is not an exception to NUREG-1801.
N-606-1	Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW Temper Bead	XI.M01-No	The Case was revised by modifying the title to make it consistent with the provisions in the Case. The second change was to eliminate the surface examination of the area to be welded prior to welding. The original Case was intended to help BWR reactor vessels, which have experienced problems with leaking control rod drive housings to stub tube welds in the bottom of the reactor vessel. Roll expansion of the CRDM housing is currently being performed to remedy the leaking stub tubes, but subsequent roll

Code Case	Discussion	Impact to AMP	Aging Management Discussion
	Technique for BWR CRD Housing/Stub tube repairs.		expansion for some vessels will cause the maximum wall thinning limits to be exceeded. This case involves corrective actions and has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-623	Deferral of Inspections of Shell to Flange and Head-to-Flange Welds of a Reactor Vessel	XI.M01-No	This Case provides rules to allow deferral of inspections of the shell-to-flange and head-to-flange welds of the reactor vessel to the end of the inspection interval. The adjustment of the inspection schedule would have no bearing on the aging management of the reactor vessel flange welds. This is not an exception to NUREG-1801.
N-624	Successive Inspections	XI.M01-No	The provisions of IWA-2430 can cause hardships when trying to reduce personnel radiation exposure (ALARA). This Case provides an alternative to the requirements of Section XI to modify the sequence of examinations established during the first inspection interval, in a manner that will optimize scaffolding, radiological issues, insulation removal, and other similar ALARA (as low as reasonably achievable) considerations. There is no reduction in the number of examinations as a result of this code rather; the sequence of examinations has been changed. This case is administrative in nature and, therefore has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-638	Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW Temper Bead Technique	XI.M01-No	This Case is almost identical with the provisions of Case N-606-1, "Similar and Dissimilar Material Welding Using Ambient Temperature Machine GTAW Temper Bead Technique for BWR CRD Housing/Stub Tube Repairs, Section XI, Division 1." The primary difference is that this Case provides for the same type of welding, but on a generic, rather than specific basis. This case involves corrective actions and has no bearing on the aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-639	Alternative Calibration Block Method	XI.M01-No	Section XI requires calibration blocks to be of the same material specification, product form, and heat treatment condition. This Case provides that material of similar chemical analysis, tensile properties, and metallurgical structure may be used when material of the same specification, product form, and heat treatment is not available. The alternative calibration blocks material specification would have no impact on aging management of systems and components within the scope of license renewal. This is not an exception to NUREG-1801.
N-640	Alternative Reference Fracture Toughness for Development of P-T Limit Curves	XI.M01-No	This Case permits the reference fracture toughness KIC curve of Fig. A-4200-1 of Appendix A to be used in lieu of the KIA curve in Fig. G-2210-1 of Appendix G, for the development of P-T limit curves. The KIA curve is a lower bound for dynamic and arrest fracture toughness, while the KIC curve is the lower bound for static fracture toughness. Because the curves being developed are for heatup and cooldown, which are slow changing activities, the static KIC curve is more appropriate. The provisions of this Case were added

Code Case	Discussion	Impact to AMP	Aging Management Discussion
			to G-1000, G-2110, Fig. G-2110-1, G-2112.1, G-2215, and G-2400 in the 1999 Addenda to Section XI. The current technical specifications contain P-T curves developed using the 1989 Edition of the ASME Boiler and Pressure Vessel Code, incorporating the effects of the 1998 power rerate and Code Case N-640. This is discussed in LRA Section 4.2.5, "RPV Thermal Limit Analysis: Operating Pressure - Temperature Limits". The use of appropriate P-T limit curves improves the systems and components ability to resist loss of fracture toughness and enhances the aging management. This is not an exception to NUREG-1801.

M. **NRC Audit Item B2.1.27-04**

Are the coatings inspectors qualified to ASTM Guide D4537 or ANSI N45.2.6?

NMC Response

The inspectors who perform the periodic inspections are qualified to plant procedures and acceptance criteria. However, they are not necessarily qualified to ASTM Guide D4537 or ANSI N45.2.6. Prior to the period of extended operation, coating inspectors will meet the requirements of ANSI N45.2.6. This commitment will be documented in the first Annual LRA Supplement.

N. **NRC Audit Item B2.1.30-01**

It is stated in B2.1.30, Selective Leaching of Materials, that "The qualitative method used in lieu of the hardness test would typically be an enhanced visual inspection consistent with ASME Section XI, VT-1 requirements. This qualitative method will be augmented, as necessary, by other Non-Destructive Examination (NDE) or metallurgical methods, as appropriate."

The above statements are not very clear. The qualitative methods should be used in lieu of hardness testing and in addition to visual testing. The statements appear to suggest that visual inspection alone may be adequate. Please explain. In addition, identify the NDE or metallurgical methods.

Appendix A2.1.30 and Commitment 42 are more definitive in the use of other NDE or metallurgical methods in addition to visual testing, than the description of the AMP B2.1.30.

NMC Response

The methods to identify the presence of selective leaching are visual inspection in conjunction with mechanistic techniques such as scratch testing, hardness testing, or nondestructive examinations.

O. **NRC Audit Item B2.1.30-02**

Commitment 42: Implementation of a new selective leaching aging management program.

Please provide a status of the implementation of the above commitments including scope of work, implementing procedures, inspected and measured parameters, and acceptance criteria. Also, provide the anticipated schedule of completion of the work associated with these commitments.

NMC Response

The implementation activities for B2.1.30, "Selective Leaching of Materials," is still in the development stage. It is expected that implementing instructions/procedures will be drafted later this year. Examples of possible implementing instructions/procedures to be created are:

- An engineering work instruction for managing the overall AMP for selective leaching
- A specific NDE procedure utilizing PT for determining the presence of selective leaching
- A hardness test procedure (based on the test equipment obtained)
- A test location selection procedure using the methodology established for One-Time Inspection (see the One-Time Inspection Program Basis Document)
- A specific visual inspection procedure utilizing enhanced VT-1

Existing site procedures, that are relevant to this AMP, will be evaluated and revised if appropriate.

Research will be conducted of industry practices for applicable methods to test for selective leaching. This research may extend beyond the nuclear industry to industries that have experience with selective leaching. Research has been conducted to identify portable hardness test equipment. So far 4 testers have been identified. These will be evaluated for MNGP's specific needs. The tester and relevant test standards will be selected and ordered.

Actual performance of relative aging management of activities is expected to be accomplished in accordance with the existing work control process.

Our current goal is to have the test equipment and implementing instructions and procedures in place to begin testing for selective leaching during the 2007 refueling outage.