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10 CFR 50
10 CFR 51
10 CFR 54

RS-14-235

August 29, 2014

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

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

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

Subject: Response to NRC Request for Additional Information, Set 38, dated August 4, 2014; LRA changes from NRR Staff Feedback on July 30, 2014 telecon; and, LRA changes from NRC Region III IP-71002 Inspection, related to the Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, License Renewal Application

References:

1. Letter from Michael P. Gallagher, Exelon Generation Company LLC (Exelon) to NRC Document Control Desk, dated May 29, 2013, “Application for Renewed Operating Licenses”

2. Letter from Lindsay R. Robinson, US NRC to Michael P. Gallagher, Exelon, dated August 4, 2014, “Request for Additional Information for the Review of the Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2, License Renewal Application, Set 38 (TAC NOS. MF1879, MF1880, MF1881, and MF1882)”

3. Letter from Lindsay R. Robinson, US NRC to Michael P. Gallagher, Exelon (ADAMS Accession Number ML14238A092), “Summary of Telephone Conference Call Held on July 30, 2014, between the U.S. Nuclear Regulatory Commission and Exelon Generation Company, LLC concerning Responses for Request for Additional Information B.2.1.30-3, 3.0.3-3A, and 2.3.3.12-4, and Draft Request for Additional Information Set 38 and 39, pertaining to the Byron Station and Braidwood Station, License Renewal Application (TAC Nos. MF1879, MF1880, MF1881, MF1882)”

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted the License Renewal Application (LRA) for the Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (BBS). In Reference 2, the NRC requested additional information to support staff review of the LRA. Enclosure A contains the response to this request for additional information.

Reference 3 summarizes a teleconference discussion in which the Staff clarified the need for additional information related to several items. Enclosure B provides information explaining and addressing each of these items.

In addition, during the NRC Region III IP-71002 Inspection conducted at Byron Station between August 4, 2014 and August 22, 2014, the Staff identified several additional items that require docketed information. These items are also explained and addressed in Enclosure B.

Enclosure C contains updates to sections of the LRA (except for the License Renewal Commitment List) affected by the responses to the Set 38 RAIs contained in Enclosure A, as well as LRA updates required as a result of the information provided in Enclosure B.

Enclosure D provides an update to the License Renewal Commitment List (LRA Appendix A, Section A.5). There are no other new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Mr. Al Fulvio, Manager, Exelon License Renewal, at 610-765-5936.

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

Executed on 8-29-2014

Respectfully,

Michael P. Gallagher

Michael P. Gallagher
Vice President - License Renewal Projects
Exelon Generation Company, LLC

Enclosures:
A. Response to Request for Additional Information
B. Summary of Additional Aging Management Program Clarifications
C. Updates to Affected LRA Sections
D. License Renewal Commitment List Changes

cc: Regional Administrator – NRC Region III
NRC Project Manager (Safety Review), NRR-DLR
NRC Project Manager (Environmental Review), NRR-DLR
NRC Senior Resident Inspector, Braidwood Station
NRC Senior Resident Inspector, Byron Station
NRC Project Manager, NRR-DORL-Braidwood and Byron Stations
Illinois Emergency Management Agency - Division of Nuclear Safety

Enclosure A

Byron and Braidwood Stations (BBS), Units 1 and 2
License Renewal Application
Responses to Requests for Additional Information

RAI 3.0.3-2c
RAI B.2.1.16-1c

RAI 3.0.3-2c

Applicability:

Byron Station (Byron) and Braidwood Station (Braidwood), Units 1 and 2

Background:

By letter dated June 30, 2014, the applicant responded to the staff's request for additional information (RAI) 3.0.3-2b Request (2), which revised license renewal application (LRA) Sections B.2.1.11, B.2.1.16, and B.2.1.18 to state that:

a) the acceptance criteria for loss of coating integrity will specify that peeling, blistering, and delamination is not acceptable;
b) peeling, blistering, or delamination of the coating from the base metal will be entered into the corrective action program;
c) if the coating is not repaired or replaced, physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal;
d) if the coating is not repaired or replaced, the potential for further degradation of the coating will be minimized, "(i.e., any loose coating is removed, the edge of the remaining coating is feathered);"
e) adhesion testing using American Society for Testing and Materials (ASTM) International standards endorsed in Regulatory Guide (RG) 1.54 will be conducted at a minimum of 3 sample points adjacent to the defective area;
f) a certified coatings inspector will assess indications of blisters, cracking, flaking, or rusting and document the condition and acceptance in a post-inspection report; and
g) if coatings exhibiting signs of peeling, blistering, or delamination will be returned to service without repair or replacement, the applicant will conduct an evaluation of the potential impact on the system, including degraded performance of downstream components due to flow blockage and loss of material of the coated component.

Issue:

The staff has concluded that immersion coatings that have exhibited delamination or peeling should be repaired or replaced prior to returning the affected component(s) to service unless the degraded coating: (a) has been inspected, tested, evaluated, and partially corrected to minimize the potential for propagation, as described above; and (b) is inspected prior to 2 years from when the degraded condition was detected and then again within 2 years to ensure that the delamination or peeling is not propagating, or the degraded coating is subsequently repaired or replaced.

Request:

Revise LRA Sections B.2.1.11, B.2.1.16, and B.2.1.18 to address corrective actions associated with coatings exhibiting peeling or delamination, which will not be repaired or replaced prior to returning the affected component(s) to service.

Exelon Response:

As stated in the response to RAI 3.0.3-2b (Exelon letter RS-14-175, dated June 30, 2014), coatings with indications of peeling or delamination are generally repaired or replaced prior to returning the coated component to service but, in certain situations, coating repair or replacement prior to returning the component to service may not be feasible. In these situations, the coating is inspected, tested, evaluated, and partially corrected to minimize the potential for propagation, as further described in the response to RAI 3.0.3-2b. To ensure that peeling or delamination does not propagate, the Open-Cycle Cooling Water System (B.2.1.11), Fire Water System (B.2.1.16) and Fuel Oil Chemistry (B.2.1.18) aging management programs are revised, as shown in Enclosure C, to specify that if a coating exhibiting signs of peeling or delamination is not repaired or replaced prior to returning the coated component to service, then either, (1) repair or replacement of the coating will be performed within two years from when the degraded condition was detected or, (2) follow-up inspections of the degraded coating will be performed within two years from when the degraded condition was detected and then again by the end of the following two-year interval to verify that the delamination or peeling is not propagating.

RAI B.2.1.16-1c

Applicability:

Byron and Braidwood

Background:

The “detection of aging effects” program element of LR-ISG-2012-02 states: “ [i]nternal visual inspections used to detect loss of material are capable of detecting surface irregularities that could be indicative of wall loss below nominal pipe wall thickness due to corrosion and corrosion product deposition. Where such irregularities are detected, followup volumetric examinations are performed.”

The response to RAI B.2.1.16b states:

“[s]ince the nominal wall thickness is the design wall thickness of new piping, any indications of loss of material, no matter how trivial, would be an indication of wall loss below nominal.”

“[u]niform corrosion of steel piping in a raw water environment is expected to occur and, as such, the wall thickness of all Fire Protection System piping can be expected to be below the nominal wall thickness.”

“[i]nternal visual inspections are incapable of providing a quantitative assessment of the amount of wall loss of system components and instead provide only a qualitative assessment of the internal condition of the system.”

“[a]s such, visual inspection results will be entered into the corrective action program if unexpected levels of degradation are identified. Unexpected levels of degradation include excessive accumulation of corrosion products and appreciable localized corrosion (e.g., pitting) beyond a normal oxide layer.”

“Corrective actions may [emphasis added by NRC staff] include follow-up volumetric inspections, if appropriate.”

“[f]ollow-up volumetric inspections will be performed as determined [emphasis added by NRC staff] by the 10 CFR Part 50 Appendix B corrective action program when visual inspections identify unexpected levels of degradation.”

The staff noted that in the previous RAI response dated March 13, 2014, LRA Sections A.2.1.16 and B.2.1.16 were enhanced for Byron only to require a minimum of 30 volumetric examinations during each 3-year interval, as a result of operating experience. The staff also noted that these sections state that existing volumetric non-destructive examinations will be credited to ensure age-related degradation is identified prior to loss of system intended function.

Issue:

The RAI response outlines the justification for an exception to conducting followup wall thickness measurements when opportunistic internal visual inspections detect loss of

material that could be indicative of wall loss below nominal pipe wall thickness. The staff has concluded that the response justifies the basis for why it is impractical to base followup wall thickness measurements on internal qualitative visual inspections. However, the response does not state what indications of unexpected degradation will result in a followup wall thickness examination.

As an alternative to opportunistic followup wall thickness measurements, the staff recognizes that periodic planned volumetric examinations could be equally effective at detecting loss of material. However, LRA Sections A.2.1.16 and B.2.1.16 do not state a minimum number of volumetric inspections that will be conducted at Braidwood, nor do they state how volumetric inspection locations will be selected at either site. In addition, although the LRA states that the volumetric examinations are being conducted at Byron as a result of operating experience, it is not clear to the staff whether the number of inspections would be reduced based on changes in operating experience.

Request:

Either provide additional details regarding the periodic volumetric examinations to be performed by the Fire Water System program (e.g., number of inspections, provisions for expanding (or reducing) inspections, inspection location selection methodology), or state what indications of unexpected degradation will result in a followup wall thickness examination for opportunistic internal visual inspections.

Exelon Response:

Appendix C of EPRI TR-102063, *Guide for the Examination of Service Water System Piping*, states that in general terms, the acceptance criteria for visual inspections of raw water system piping is that any condition which would threaten the performance capability or structural integrity of the system before the next examination is unacceptable. If, due to the qualitative nature of visual inspections, this determination cannot be made based on the results of the visual inspection alone, then appropriate follow-up actions, including a quantitative assessment of wall loss if applicable, are performed. More specific acceptance criteria are difficult to define since acceptability is highly dependent on component-specific design and historic performance and inspection results. As such, the BBS Fire Water System (B.2.1.16) aging management program will rely on the 10 CFR Part 50 Appendix B corrective action program to ensure that appropriate follow-up actions are performed based on the results of internal visual inspections of Fire Protection System piping. Since it is impractical to define specific global acceptance criteria for internal visual inspections of Fire Protection System piping, the BBS Fire Water System (B.2.1.16) aging management program will rely on periodic volumetric examinations to manage loss of material in the system rather than opportunistic follow-up wall thickness measurements.

Existing Byron and Braidwood procedures do not define the minimum required number of volumetric examinations of Fire Protection System piping. In order to ensure that sufficient volumetric examinations are performed to provide reasonable assurance that loss of material of Fire Protection System piping is detected prior to loss of intended function, the Fire Water System (B.2.1.16) aging management program is revised as shown in Enclosure C to require a minimum of 25 volumetric examinations, using radiographic testing or ultrasonic testing, every ten (10) years at both Byron and

Braidwood. This minimum sample size is consistent with NRC guidance provided in GALL Report AMP XI.M38, “Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components” as modified by LR-ISG-2012-02, “Aging Management of Internal Surfaces, Fire Water Systems, Atmospheric Storage Tanks, and Corrosion Under Insulation.” GALL Report AMP XI.M38 is applicable to components with equivalent materials and environments (e.g., VII.C1.A-408, VIII.G.SP-136). This minimum inspection sample size is not based on plant-specific operating experience but is rather the minimum representative sample required to ensure that loss of material is detected prior to loss of intended function.

In addition, the Fire Water System (B.2.1.16) aging management program was enhanced in the response to RAI B.2.1.16-2 (Exelon letter RS-14-078, dated March 13, 2014) to require a minimum of 30 volumetric examinations of Fire Protection System piping at Byron, using radiographic testing or ultrasonic testing, during each three (3) year interval to address plant-specific operating experience. Since this Byron-specific minimum inspection requirement bounds the new Byron and Braidwood minimum inspection requirement defined above, this requirement governs at Byron. However, since this requirement is based on plant-specific operating experience, this enhancement is revised to identify the criteria that could be used to reduce the number of required examinations based on positive operating experience. Specifically, the enhancement is revised to state that if volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50%, then the minimum sample size identified in the enhancement is no longer required. In this case, a minimum of 25 volumetric examinations every ten (10) years would still be required since this minimum sample size is independent of plant-specific operating experience.

Existing Byron and Braidwood procedures include guidance for the selection of locations for inspection of raw water piping systems, including the Fire Protection System. Raw water system piping is risk ranked based on susceptibility of corrosion and consequences of leaks to determine locations for inspection. Corrosion susceptibility is determined based on many factors including flow conditions, material, piping size, configuration, and the results of prior inspections. The consequence of leaks considers the safety and production consequences, and considers the impact of leakage or spray on nearby safety-related and production-related equipment.

With respect to inspection sample expansion, existing Byron and Braidwood procedures for the examination of raw water piping systems include guidance for performing examinations at additional locations when piping degradation is identified as the result of planned examinations. When volumetric examinations of Fire Protection System piping are performed and degradation is identified, additional inspections are performed in accordance with the following criteria:

- at least four (4) additional locations will be examined if wall loss is greater than 50 percent of nominal wall thickness,
- two (2) additional locations will be examined if wall loss is 30 percent to 50 percent of nominal wall thickness and the calculated remaining life is less than two (2) years,
- no additional examinations are required if wall loss is less than 30 percent of nominal wall thickness.

LRA Sections A.2.1.16 and B.2.1.16 are revised as shown in Enclosure C to specify the requirements related to periodic volumetric examinations, as described above. LRA Appendix A, Table A.5 is revised as shown in Enclosure D to reflect the changes described above.

Enclosure B – Summary of Additional Aging Management Program Clarifications

Based on discussions with NRC Staff it has been determined that the following aging management programs require further detail beyond what is provided in the program descriptions provided in the LRA (Appendix A and/or Appendix B):

1. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)
2. Bolting Integrity (B.2.1.9)
3. Open-Cycle Cooling Water System (B.2.1.11)
4. One-Time Inspection (B.2.1.20)
5. ASME Section XI, Subsection IWF (B.2.1.31)

Additional information related to each of the aging management programs listed above is provided in this Enclosure. Revisions to the LRA based on the information provided in this Enclosure are included in Enclosure C. Updates to the BBS LRA Appendix A, Table A.5 License Renewal Commitment List are provided in Enclosure D, as required.

1. <u>ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1)</u>:

   During the NRC Region III IP-71002 Inspection at Byron Station, it was requested that additional information be added to the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program (LRA Sections A.2.1.1 and B.2.1.1) regarding inspections performed utilizing EPRI Maintenance Reliability Programs MRP-146, "Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant Branch Lines" and MRP-192 (Braidwood only), "Assessment of RHR Mixing Tee Thermal Fatigue in PWR Plants." Additionally, the Appendix B program description for the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1) aging management program did not identify that the program utilizes 10 CFR 50.55a to impose additional limitations, modifications, and augmentations of ISI requirements beyond those stated in ASME Code, Section XI. Exelon agreed to provide the additional detail to LRA Sections A.2.1.1 and B.2.1.1. Revisions to LRA Sections A.2.1.1 and B.2.1.1 are provided in Enclosure C.

2. <u>Bolting Integrity (B.2.1.9)</u>:

   Exelon and representatives of the NRC held a telephone conference call on July 30, 2014, to discuss and clarify the response to RAI 2.3.3.12-4 (Exelon letter RS-14-218, dated July 18, 2014). The NRC expressed uncertainty on the function of the bolting that was added to LRA Table 3.3.2-12 in the response to RAI 2.3.3.12-4. In addition, the NRC expressed uncertainty regarding the method and frequency of inspections that will be used to manage loss of material of the bolting. Based on this discussion, Exelon agreed to provide further information regarding the function of the bolting and proposed aging management activities related to the bolting in a docketed submittal. To address the NRC's concern, additional information regarding the function of the bolting and aging management activities related to the bolting is provided as follows:

   > The Braidwood Lake Screen House intake bay traveling screens consist of a series of baskets mounted to a chain which allows for online debris removal from

the basket mesh. The baskets are mounted to the chain with bolting composed of copper alloy with less than 15% zinc. Loss of preload of these bolts is prevented through the use of lock washers. Aging of this bolting is managed by the Bolting Integrity (B.2.1.9) aging management program. Each basket-to-chain mounting bolt is visually inspected at least once every six (6) years. The inspection includes verification that the tabs of the lock washers are properly oriented such that the bolt is secure. If any indication of looseness is observed, then the bolting is re-torqued and proper orientation of the lock washers is verified to ensure the bolt is secure. Opportunistic visual inspections of the bolt threads are performed when the threads are made accessible during traveling screen maintenance. In addition, the bolting is visually inspected during annual Lake Screen House diver inspections. During the diver inspections the traveling screen is jogged through a cycle and each bolt is visually inspected.

In addition, during the NRC Region III IP-71002 Inspection at Byron Station, it was requested that a clarification of the Bolting Integrity aging management program (LRA Sections A.2.1.9 and B.2.1.9) be provided to specify that aging of non-pressure retaining bolting associated with the integral reactor vessel head assembly (IHA) is managed by this program. Exelon agreed to provide the additional detail to LRA Sections A.2.1.9 and B.2.1.9. Revisions to LRA Sections A.2.1.9 and B.2.1.9 are provided in Enclosure C.

3. Open-Cycle Cooling Water System (B.2.1.11):

During the NRC Region III IP-71002 Inspection at Byron Station, it was requested that additional information be added to the Open-Cycle Cooling Water System aging management program (LRA Sections A.2.1.11 and B.2.1.11) regarding aging management of nonsafety-related components managed by the program, including nonsafety-related heat exchangers and the deep well pumps. Exelon agreed to provide the additional detail to LRA Sections A.2.1.11 and B.2.1.11. Revisions to LRA Sections A.2.1.11 and B.2.1.11 are provided in Enclosure C.

4. One-Time Inspection (B.2.1.20):

Exelon and representatives of the NRC held a telephone conference call on July 30, 2014, to discuss and clarify the update to the One-Time Inspection (B.2.1.20) aging management program submitted in Exelon letter RS-14-218, dated July 18, 2014. Based on this discussion, Exelon agreed to review the applicable LRA sections and provide revisions, as appropriate, to provide additional clarity with respect to the scope of the One-Time Inspection (B.2.1.20) aging management program and to provide additional detail in the Appendix A UFSAR supplement. Revisions to LRA Sections A.2.1.20 and B.2.1.20 are provided in Enclosure C.

5. ASME Section XI, Subsection IWF (B.2.1.31):

During the NRC Region III IP-71002 Inspection at Byron Station, discussions were held with NRC staff regarding the control rod drive mechanism (CRDM) seismic support assembly, which is not currently within the scope of the IWF program. This issue was previously identified and reported in the Corrective Action Program at Exelon as a result of industry operating experience. The integral reactor vessel head assembly (IHA) includes the CRDM seismic support assembly as a sub-element. The External Surfaces

Monitoring of Mechanical Components (B.2.1.23) and Boric Acid Corrosion (B.2.1.4) aging management programs are credited in the LRA with managing the aging of all of the elements of the IHA, including the CRDM seismic support assembly. The IHA is evaluated with the Reactor Vessel as component type "Equipment supports and foundations (Integral Reactor Vessel Head Assembly)." As a follow-up to the NRC Region III IP-71002 Inspection at Byron Station, the CRDM seismic support assembly will be included within the scope of the ASME Section XI, Subsection IWF (B.2.1.31) aging management program. The reactor head lifting lugs, which also provide restraint for the bottom of the IHA, will be examined as part of the CRDM seismic support assembly examinations. VT-3 examinations of the CRDM seismic support assembly will be performed in accordance with the ASME Section XI, Subsection IWF (B.2.1.31) aging management program requirements for Class 1 component supports during every ten (10) year ISI inspection interval. This will be a new enhancement to the ASME Section XI, Subsection IWF (B.2.1.31) aging management program. In addition, line items will be added to the Component Supports Commodity group to identify the CRDM seismic support assembly.

The revisions to LRA Section 2.4.3, Table 2.4-3, Table 3.5.2-3, Appendix A, Section A.2.1.31, and Appendix B, Section B.2.1.31 are provided in Enclosure C. Revisions to the BBS LRA Appendix A, Table A.5 License Renewal Commitment List, Item No. 31 are provided in Enclosure D.

Enclosure C

Byron and Braidwood Stations, Units 1 and 2
License Renewal Application (LRA) updates resulting from the responses to the following RAIs:

RAI 3.0.3-2c
RAI B.2.1.16-1c

In addition, this Enclosure includes updates to the LRA as described in Enclosure B.

Note: To facilitate understanding, the original LRA pages have been repeated in this Enclosure, with revisions indicated. Existing LRA text, as modified by subsequent submittals, is shown in normal font. Changes are highlighted with ***bolded italics*** for inserted text and ~~strikethroughs~~ for deleted text.

LRA Section 2.4.3, on page 2.4-15, is revised as shown below to provide additional detail for the Component Support Commodity Group as described in Item 5 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

2.4.3 Component Supports Commodity Group

Description

The Components Support Commodity Group consists of structural elements and specialty components designed to transfer the load applied from a system, structure, or component (SSC) to the building structural element or directly to the building foundation. Supports include bolted connections, seismic anchors or restraints, support members, constant and variable spring hangers, rod hangers, guides, stops, straps, clamps, and clevis pins. Specialty components include snubbers, sliding support bearings and surfaces, vibration isolation elements, and high strength bolting.

The commodity group is comprised of the following supports:

- Supports for ASME Class 1, 2 and 3, and MC piping and components, including reactor pressure vessel support shoes, steam generator supports, pressurizer supports, and reactor coolant pump supports.

- Supports for cable trays, conduits, HVAC ducts, tube tracks, instrument tubing and non-ASME piping and components.

- Supports for emergency diesel generators (EDG), HVAC system components, and other miscellaneous mechanical equipment.

- Supports for platforms, pipe whip restraints, jet impingement shields, masonry walls, and other miscellaneous structures.

- Supports for racks, panels, cabinets, and enclosures for electrical equipment and instrumentation.

- Seismic support assembly for the control rod drive mechanisms.

LRA Table 2.4-3, on page 2.4-18, is revised as shown below to provide additional detail for the Component Support Commodity Group as described in Item 5 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

Table 2.4-3 Component Supports Commodity Group
Components Subject to Aging Management Review

Component Type	Intended Function
Control rod drive mechanism seismic support assembly	***Structural Support***

LRA Table 3.5.2-3, on page 3.4-107, is revised as shown below and on page 3.5-130, where plant specific note #8 is added, to provide additional detail for the Component Support Commodity Group as described in Item 5 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

Table 3.5.2-3 Component Supports Commodity Group

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Item	Table 1 Item	Notes
Control rod drive mechanism seismic support assembly	***Structural Support***	***Carbon Steel***	***Air with Borated Water Leakage***	***Loss of Material***	***Boric Acid Corrosion (B.2.1.4)***	***III.B1.1.T-25***	***3.5.1-89***	***A, 8***
					ASME Section XI, Subsection IWF (B.2.1.31)	***III.B1.1.T-24***	***3.5.1-91***	***B, 8***
				Loss of Mechanical Function	***ASME Section XI, Subsection IWF (B.2.1.31)***	***III.B1.1.T-28***	***3.5.1-57***	***B, 8***
Control rod drive mechanism seismic support assembly	***Structural Support***	***Carbon and Low Alloy Steel Bolting***	***Air with Borated Water Leakage***	***Loss of Material***	***Boric Acid Corrosion (B.2.1.4)***	***III.B1.1.T-25***	***3.5.1-89***	***A, 8***
					ASME Section XI, Subsection IWF (B.2.1.31)	***III.B1.1.TP-226***	***3.5.1-81***	***B, 8***
				Loss of Preload	***ASME Section XI, Subsection IWF (B.2.1.31)***	***III.B1.1.TP-229***	***3.5.1-87***	***B, 8***

Plant Specific Notes:

8. The control rod drive mechanism seismic support assembly (which is considered to include the reactor head lifting lugs) is a sub-element of the integral reactor vessel head assembly. All of the elements of the integral reactor vessel head assembly are evaluated as part of the Reactor Vessel as component type "Equipment supports and foundations (Integral Reactor Vessel Head Assembly)".

LRA Appendix A, Section A.2.1.1, on page A-10, is revised as shown below to provide additional detail regarding the aging management activities provided by the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program, as described in Item 1 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program is an existing condition-monitoring program that consists of periodic volumetric, surface, and/or visual examinations of ASME Class 1, 2, and 3 pressure-retaining components, including welds, pump casings, valve bodies, integral attachments, and pressure-retaining bolting for assessment, identification of signs of age-related degradation, and establishment of corrective actions. The program includes examinations and tests performed to identify and manage cracking, loss of fracture toughness, and loss of material in Class 1, 2, and 3 piping and components. This ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program is implemented in accordance with 10 CFR 50.55a and ASME Code, Section XI***, and is supplemented by EPRI Maintenance Reliability Programs MRP-146, "Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant Branch Lines" and MRP-192 (Braidwood only), "Assessment of RHR Mixing Tee Thermal Fatigue in PWR Plants."*** These activities include examinations, testing, detection, monitoring and trending, and evaluation of results to confirm that aging effects are managed during the period of extended operation.

The control rod drive mechanism (CRDM) thermal sleeves are examined under an augmented ISI inspection program. The scope of examination is to ultrasonically test (UT) the five (5) thermal sleeves with the worst wear on each unit. The plan for managing thermal sleeve wear is to obtain measured (UT) wear data points on each unit at the five (5) designated thermal sleeve reactor core locations during three (3) different outages. The frequency for inspection of the reactor vessel head thermal sleeve for loss of material due to wear will be re-evaluated after the accumulation of the three (3) data points on each of the five (5) designated thermal sleeves. The three (3) series of examinations will be performed prior to the period of extended operation. Subsequently, the required frequency for further inspections, if required, will be determined using the guidance provided in WCAP-16911-P, "Reactor Vessel Head Thermal Sleeve Wear Evaluation for Westinghouse Domestic Plants."

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program will be enhanced to:

1. Conduct a visual inspection of the accessible portions of the ASME Class 2 reactor vessel flange leakage monitoring tube every other refueling outage.

This enhancement will be implemented prior to the period of extended operation.

LRA Appendix A, Section A.2.1.9, on page A-14, is revised as shown below to provide additional detail regarding the aging management activities provided by the Bolting Integrity aging management program, as described in Item 2 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.9 Bolting Integrity

The Bolting Integrity aging management program is an existing condition monitoring program. The program provides for aging management for loss of preload, cracking, and loss of material due to corrosion of closure bolting on pressure retaining joints within the scope of license renewal. The Bolting Integrity program incorporates NRC and industry recommendations delineated in NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants," EPRI NP-5769, "Degradation and Failure of Bolting in Nuclear Power Plants," and EPRI TR-104213, "Bolted Joint Maintenance & Applications Guide."

The program credits visual inspection of pressure retaining bolted joints in ASME Class 1, 2, and 3 systems for leakage and age-related degradation during system pressure tests performed in accordance with ASME Section XI, 2001 Edition through the 2003 Addenda. In addition, the Bolting Integrity aging management program credits volumetric, surface, and visual inspections of ASME Class 1, 2, and 3 bolts, nuts, washers, and associated bolting components performed in accordance with ASME Section XI, Subsections IWB, IWC, and IWD. The integrity of non-ASME (nonsafety-related) pressure retaining bolted joints (in non-ASME Class 1, 2, 3 and MC systems) is monitored by detection of visible leakage, evidence of past leakage, or other age-related degradation during maintenance activities and walkdowns in plant areas that contain systems within scope of license renewal. Inspection activities of closure bolting on pressure retaining joints within the scope of license renewal in submerged environments will be performed in conjunction with associated component maintenance activities. ***Additionally, the integral reactor vessel head assembly bolting is managed by this program.***

The Bolting Integrity aging management program is supplemented by ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program, as described in A.2.1.1, for inspection of safety-related closure bolting on pressure retaining joints. Inspection activities for closure bolting on pressure retaining joints in buried and underground environments are performed by the Buried and Underground Piping (A.2.1.28) program when closure bolting on pressure retaining joints are exposed by excavation.

The Primary Containment (MC) pressure bolting is managed as part of ASME Section XI, Subsection IWE (A.2.1.29) program. The ASME Section XI, Subsection IWF (A.2.1.31) program manages ASME Class 1, 2, 3 and MC piping and component supports bolting. Structural bolting, other than ASME Class 1, 2, 3, and MC piping and component supports is managed as part of the Structures Monitoring (A.2.1.34) program and R.G. 1.127, Inspection of Water Control Structures Associated With Nuclear Power Plants (A.2.1.35) program. Crane and hoist bolting is managed by the Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (A.2.1.13) program. The heating and ventilation system bolting is managed by the External Surfaces Monitoring of Mechanical Components (A.2.1.23) program. Reactor head closure bolting is managed by the Reactor Head Closure Stud Bolting (A.2.1.3)

program. The above bolting is not included in the Bolting Integrity Program.

The Bolting Integrity aging management program will be enhanced to:

1. Prohibit the use of lubricants containing molybdenum disulfide on pressure retaining bolted joints.

2. Prohibit the use of high strength bolting (actual measured yield strength equal to or greater than 150 ksi) for pressure retaining bolted joints in portions of systems within the scope of the Bolting Integrity program.

3. Perform visual inspection of submerged bolting on fire protection system pumps (Byron only) and well water system deep well pumps (Byron only) when submerged portions of the pumps are overhauled or replaced during maintenance activities.

These enhancements will be implemented prior to the period of extended operation.

LRA Appendix A, Section A.2.1.11, on page A-17, is revised as shown below to provide additional detail regarding the aging management activities provided by the Open-Cycle Cooling Water System aging management program, as described in Item 3 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Deleted text is highlighted by ~~strikethroughs~~. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.11 Open-Cycle Cooling Water System

The Open-Cycle Cooling Water System (OCCWS) aging management program is an existing preventive, mitigative, condition monitoring, and performance monitoring program based on the implementation of NRC GL 89-13, which includes (a) surveillance and control of bio-fouling, (b) tests to verify heat transfer, (c) routine inspection and maintenance program, (d) system walkdown inspection, and (e) review of maintenance, operating, and training practices and procedures. The Open-Cycle Cooling Water System program applies to components constructed of various materials, including steel, stainless steel, gray cast iron, copper alloys, nickel alloys, titanium, and polymeric materials.

The Open-Cycle Cooling Water System (OCCWS) aging management program manages heat exchangers, piping, piping elements, and piping components in safety-related and nonsafety-related raw water systems that are exposed to a raw water environment for loss of material, loss of coating integrity, and reduction of heat transfer. The guidelines of NRC Generic Letter 89-13 are implemented through the site GL 89-13 activities for heat exchangers and the Raw Water Corrosion program for piping segments. System and component testing, visual inspections, non-destructive examination (NDE) (i.e., ultrasonic testing and eddy current testing), and chemical injection are conducted to ensure that identified aging effects are managed such that system and component intended functions and integrity are maintained.

The OCCWS aging management program includes those systems that transfer heat from safety-related systems, structures, and components to the ultimate heat sink as defined in GL 89-13. Periodic heat transfer testing, visual inspection, and cleaning of safety-related heat exchangers with a heat transfer intended function is performed in accordance with the sites' commitments to GL 89-13 to verify heat transfer capabilities. Additionally, safety-related piping segments are NDE tested periodically to ensure that there is no significant loss of material, which could cause a loss of intended function.

Safety-related and nonsafety-related piping inspections are performed using a 100% scan ultrasonic testing method, where possible, to ensure that localized corrosion indicative of microbiologically influenced corrosion (MIC) is detected. The inspections required by this program are performed at locations that are chosen to be leading indicators of the material condition of the internal surface of components within the scope of the program. The specific locations for inspections are chosen based on commitments made in the Byron and Braidwood responses to NRC GL 89-13, piping configuration, flow conditions (e.g., stagnant or low flow areas), and operating history (e.g., prior inspection results). The maximum interval for re-inspection is based on the calculated remaining life of the component. If required, piping replacement is performed prior to the development of through-wall leakage.

Periodic inspections of nonsafety-related heat exchangers, piping and piping components (including deep well pumps at Byron only) are being performed to manage aging effects. In scope, nonsafety-related heat exchangers do not have heat transfer intended functions, therefore, no heat transfer testing is performed. Nonsafety-related piping segments which have the potential for spatial interactions with safety-related equipment will be NDE tested periodically as delineated in Enhancement 1.

In addition, the internal coatings of components within the scope of this program are periodically visually inspected to ensure that loss of coating integrity is detected prior to (1) loss of component intended function, including loss of function due to accelerated degradation caused by localized coating failures, and (2) degradation of downstream component performance due to flow blockage. Inspections of internal coatings will be performed by qualified coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. If peeling, blistering, or delamination is detected and the coating is not repaired, then physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal and the as-left condition of the coating will be such that the potential for further degradation of the coating is minimized (i.e., any loose coating is removed, the edge of the remaining coating is feathered). The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677 07). Evidence of unacceptable coating degradation is entered into the corrective action program. The results of inspections of internal coatings are trended and used to adjust inspection frequencies as determined by the ASTM D7108 qualified Site Coating Coordinator.

~~Nonsafety-related piping segments which have the potential for spatial interactions with safety-related equipment will be NDE tested periodically as delineated in the enhancement described below.~~

The Open-Cycle Cooling Water system aging management program will be enhanced to:

1. Perform periodic volumetric inspections for loss of material in the non-essential service water system piping at a minimum of two (2) locations on each unit in both the auxiliary building and the turbine building for a total of four (4) periodic inspections per unit every refueling cycle.

2. Require inspections of internal coatings be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54.

3. Specify that signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program.

4. Require physical testing of internal coatings, where physically possible, to ensure that remaining coating is tightly bonded to the base metal when peeling, blistering, or delamination is detected and the coating is not repaired or replaced. The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07).

5. Require that evaluations utilized to return a coated component exhibiting signs of peeling, blistering, or delamination to service without repairing or replacing the coating shall consider the potential impact on the intended function of the system. This evaluation shall include consideration of the potential for degraded performance of downstream components due to flow blockage and loss of material of the coated component.

6. Require the as-left condition of a coating that exhibited signs of peeling, blistering, or delamination and that is not repaired or replaced is such that the potential for further degradation of the coating is minimized.

These enhancements will be implemented prior to the period of extended operation.

As a result of the response to RAI B.2.1.16-1c provided in Enclosure A of this letter, LRA Appendix A, Section A.2.1.16, on page A-21, is revised as shown below. Text inserted as a result of the response to RAI B.2.1.16-1c is highlighted by ***bolded italics***. Deleted text is highlighted by ~~strikethroughs~~. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.16 Fire Water System

The Fire Water System aging management program is an existing condition monitoring program that provides for system pressure monitoring, system header flushing, buried ring header flow testing, pump performance testing, hydrant full flow flushing and full flow verification, sprinkler and deluge system flushing and flow testing, hydrostatic testing, and inspection activities. Major component types managed by this program include sprinklers, fittings, valves, hydrants, hose stations, standpipes, tanks, pumps, and aboveground and buried piping and components. There are no underground (i.e., below grade but contained within a tunnel or vault) piping and components within the scope of the Fire Water System aging management program. This program manages aging effects of loss of material due to corrosion (including MIC), reduction in heat transfer due to fouling, and flow blockage due to fouling.

Opportunistic visual inspections, performed when the internal surface of the system is made accessible due to normal plant maintenance activities, and ~~existing~~ volumetric non-destructive examinations (i.e., guided wave***, radiographic testing,*** and ultrasonic inspections) will be credited to ensure age related degradation is identified prior to loss of system intended function. ***Fire Protection System piping is risk ranked based on susceptibility to corrosion and consequences of leaks to determine locations for inspection. When volumetric examinations of Fire Protection System piping are performed and degradation is identified, additional inspections are performed in accordance with the following criteria:***

- ***at least four (4) additional locations will be examined if wall loss is greater than 50 percent of nominal wall thickness,***
- ***two (2) additional locations will be examined if wall loss is 30 percent to 50 percent of nominal wall thickness and the calculated remaining life is less than two (2) years,***
- ***no additional examinations are required if wall loss is less than 30 percent of nominal wall thickness.***

To ensure that sufficient volumetric examinations are performed such that age-related degradation is identified prior to loss of intended function, the Fire Water System program will be enhanced to require a minimum of 25 volumetric examinations, using radiographic testing or ultrasonic testing, every ten (10) years at both Byron and Braidwood independent of plant-specific operating experience. At Byron only, the program will be enhanced to require a minimum of 30 volumetric examinations***, using radiographic testing or ultrasonic testing,*** during each three year interval ***to address recurring internal corrosion (RIC) due to MIC***. ***If volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50 percent, then RIC is no longer occurring and this minimum sample size is no longer required.***

In addition, the program will be enhanced to perform additional inspections as described in the Enhancements below. Internal visual inspections or radiographic testing will be performed at the end of one (1) fire main and the end of one (1) branch line on half of the wet pipe sprinkler system every five (5) years. The wet pipe sprinkler systems that are not inspected during a five (5) year period will be inspected during the subsequent five (5) year period. Internal visual inspections are primarily relied upon for detection of flow blockage. Internal visual inspections are only capable of providing qualitative assessments of the internal condition of system piping with respect to loss of material. If unexpected levels of degradation are identified then the condition is entered into the corrective action program for evaluation. Unexpected levels of degradation include excessive accumulation of corrosion products and appreciable localized corrosion (e.g., pitting) beyond a normal oxide layer.

At Braidwood only, periodic visual inspections of the traveling screens located upstream of the fire pumps are performed during diver inspections of 1A and 2A intake bays.

Buried ring header flow tests measure hydraulic resistance and compare results with previous testing as a means of evaluating the internal piping conditions. Monitoring system piping flow characteristics ensures that signs of loss of material will be detected in a timely manner.

System functional tests, flow tests (including air flow tests), flushes, and inspections are performed in accordance with the applicable guidance from National Fire Protection Association (NFPA) codes and standards. The program will be enhanced to include annual main drain testing in accordance with NFPA 25, Section 13.2.5. These activities are performed periodically to ensure that the loss of material due to corrosion aging effect is managed such that the system and component intended functions are maintained.

In addition, the program will be enhanced to require portions of the water-based fire protection system that are: (a) normally dry but periodically subjected to flow and (b) cannot be drained or allow water to collect be subjected to augmented testing beyond that specified in NFPA 25. The augmented testing will include: (1) periodic full flow tests at the design pressure and flow rate or internal visual inspections and (2) volumetric wall-thickness examinations. Inspections and testing will commence five (5) years prior to the period of extended operation and will be conducted on a five (5) year frequency thereafter.

In addition, the internal coatings of components within the scope of this program are periodically visually inspected to ensure that loss of coating integrity is detected prior to (1) loss of component intended function, including loss of function due to accelerated degradation caused by localized coating failures, and (2) degradation of downstream component performance due to flow blockage. Inspections of internal coatings will be performed by qualified coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. If peeling, blistering, or delamination is detected and the coating is not repaired, then physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal and the as-left condition of the coating will be such that the potential for further degradation of the coating is minimized (i.e., any loose coating is removed, the edge of the remaining coating is feathered). The testing will consist of adhesion testing

using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). Evidence of unacceptable coating degradation is entered into the corrective action program. The results of inspections of internal coatings are trended and used to adjust inspection frequencies as determined by the ASTM D7108 qualified Site Coating Coordinator.

The Fire Water System aging management program will be enhanced to:

1. Replace sprinkler heads or perform 50-year sprinkler head testing using the guidance of NFPA 25 “Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems” (2002 Edition), Section 5.3.1.1.1. This testing will be performed at the 50-year in-service date and every 10 years thereafter.

2. Provide for chemical addition, accompanied with system flushing to allow for adequate dispersal of the chemicals throughout the system, to prevent or minimize microbiologically induced corrosion (Byron only).

3. Perform main drain testing annually, in accordance with NFPA 25, “Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems,” Section 13.2.5.

4. Perform air flow testing of deluge systems that are not subject to periodic full flow testing on a three (3) year frequency to verify that internal flow blockage is not occurring (Byron only).

5. Perform inspections of Fire Protection System strainers when the system is reset after automatic actuation for signs of internal flow blockage (e.g., buildup of corrosion particles) (Braidwood only).

6. Increase the frequency of visual inspections of the internal surface of the foam concentrate tanks to at least once every ten (10) years. At least one (1) inspection will be performed within the ten (10) year period prior to entry into the period of extended operation, with subsequent inspections performed every ten (10) years thereafter.

7. Perform radiographic testing or internal visual inspections every five (5) years at the end of one (1) fire main and the end of one (1) sprinkler system branch line in half of the wet pipe sprinkler system within the scope of license renewal. If internal flow blockage that could result in failure of the system to deliver the required flow is identified, then perform an obstruction investigation.

8. Perform augmented testing beyond that specified in NFPA 25 on those portions of the water-based fire protection system that are: (a) normally dry but periodically subjected to flow and (b) cannot be drained or allow water to collect. The augmented testing will include: (1) periodic full flow tests at the design pressure and flow rate or internal visual inspections and (2) volumetric wall-thickness examinations. Inspections and testing will commence five (5) years prior to the period of extended operation and will be conducted on a five (5) year frequency thereafter.

9. Perform a minimum of 30 volumetric examinations of Fire Protection System piping***, using radiographic testing or ultrasonic testing,*** during each three year interval***. If volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50 percent, then this minimum sample size is no longer required.*** (Byron only)~~.~~

10. Require inspections of internal coatings be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54.

11. Specify that signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program.

12. Require physical testing of internal coatings, where physically possible, to ensure that remaining coating is tightly bonded to the base metal when peeling, blistering, or delamination is detected and the coating is not repaired or replaced. The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07).

13. Require that evaluations utilized to return a coated component exhibiting signs of peeling, blistering, or delamination to service without repairing or replacing the coating shall consider the potential impact on the intended function of the system. This evaluation shall include consideration of the potential for degraded performance of downstream components due to flow blockage and loss of material of the coated component.

14. Require the as-left condition of a coating that exhibited signs of peeling, blistering, or delamination and that is not repaired or replaced is such that the potential for further degradation of the coating is minimized.

15. Perform a minimum of 25 volumetric examinations of Fire Protection System piping using, radiographic testing or ultrasonic testing, during each 10-year interval.

These enhancements will be implemented prior to the period of extended operation, with the testing and inspections performed in accordance with the schedule described above.

LRA Appendix A, Section A.2.1.20, on page A-25, is revised as shown below to provide additional detail regarding the aging management activities provided by the One-Time Inspection aging management program, as described in Item 4 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.20 One-Time Inspection

The One-Time Inspection aging management program is a new condition monitoring program that will be used to verify the system-wide effectiveness of the Water Chemistry (A.2.1.2) program, Fuel Oil Chemistry (A.2.1.18) program, and Lubricating Oil Analysis (A.2.1.26) program which are designed to prevent or minimize age-related degradation so that there will not be a loss of intended function during the period of extended operation. The program manages loss of material, cracking, and reduction of heat transfer in piping, piping components, piping elements, tanks, pump casings, heat exchangers, and other components within the scope of license renewal. The program identifies inspections focused on locations that are isolated from the flow stream, that are stagnant, or that have low flow for extended periods and are susceptible to the gradual accumulation or concentration of agents that promote certain aging effects. A representative sample size of 20 percent of the population (up to a maximum of 25 component inspections) will be established for each of the sample groups and will focus on the bounding or lead components most susceptible to aging due to time in service and severity of operating conditions. The program verifies either no unacceptable age-related degradation is occurring or triggers additional actions that will assure the intended function of affected components will be maintained during the period of extended operation.

The One-Time Inspection aging management program will also be utilized, in specific cases where existing data is insufficient:

a) to validate that a particular aging effect is not occurring, or
b) to verify that the aging effect is occurring slowly enough to not affect a components intended function during the period of extended operation.

In these cases, the components will not require additional aging management. ***The One-Time Inspection aging management program will include inspections of insulated and uninsulated stainless steel or aluminum alloy piping and components located outdoors to verify that stress corrosion cracking is not occurring or is occurring slowly enough to not affect a components intended function during the period of extended operation.***

The elements of the program include (a) determination of the sample size of components to be inspected based on an assessment of materials of fabrication, environment, plausible aging effects, and plant-specific and industry operating experience, (b) identification of the inspection locations in the system or component based on the potential for the aging effect to occur, (c) determination of the examination technique, including acceptance criteria that would be effective in managing the aging effect for which the component is examined, and (d) an evaluation of the need for follow-up examinations to monitor the progression of aging if age-related degradation is found that could adversely impact an intended function before the end of the period of extended operation.

This program is not used for systems or components with known age-related

degradation or when the environment in the period of extended operation is not expected to be equivalent to that in the prior 40 years. Periodic inspections will be used in these cases.

The One-Time Inspection program will be implemented prior to the period of extended operation. The one-time inspections will be performed within the 10 year period prior to the period of extended operation.

LRA Appendix A, Section A.2.1.31, on page A-34, is revised to add Enhancement 6 as shown below. The new enhancement provides additional information regarding the aging management activities provided by the ASME Section XI, Subsection IWF aging management program, as described in Item 5 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.2.1.31 ASME Section XI, Subsection IWF

The ASME Section XI, Subsection IWF aging management program is an existing program that consists of periodic visual examinations of component supports, evaluation, and corrective actions. The scope of the program includes ASME Class 1, 2, 3, and MC piping and component supports and high-strength structural bolting. The supports are examined for signs of degradation such as loss of material, loss of mechanical function, and loss of pre-load. The program is implemented through corporate and station procedures, which provide inspection and acceptance criteria consistent with the requirements of the ASME Code, Section XI, Subsection IWF as approved in 10 CFR 50.55a. This program is in accordance with ASME Section XI, Subsection IWF, 2001 Edition through the 2003 Addenda. The monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant degradation.

The ASME Section XI, Subsection IWF aging management program will be enhanced to:

6. Add the control rod drive mechanism seismic support assembly to the scope of the program to implement additional examinations.

The program description of LRA Appendix B, Section B.2.1.1, on page B-14, is revised as shown below to provide additional detail regarding the aging management activities provided by the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program, as described in Item 1 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD

Program Description

The existing ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program manages the aging effects of cracking, loss of fracture toughness, and loss of material in Class 1, 2, and 3 piping and components exposed to air with borated water leakage, reactor coolant, reactor coolant and neutron flux, treated borated water, steam, and treated water environments. ***10 CFR 50.55a imposes additional limitations, modifications, and augmentations of ISI requirements specified in ASME Code, Section XI, and those limitations, modifications, or augmentations described in 10 CFR 50.55a are included as part of this program.*** This condition monitoring program includes periodic visual, surface, and volumetric examination and leakage testing of Class 1, 2, and 3 pressure-retaining components including welds, pump casings, valve bodies, integral attachments, and pressure-retaining bolting for assessment, identification of signs of age-related degradation, and establishment of corrective actions. The program includes examinations and tests performed to identify and manage cracking, loss of fracture toughness, and loss of material in Class 1, 2, and 3 piping and components. Inspection of these components is in accordance with Subsections IWB, IWC, and IWD, respectively.

The control rod drive mechanism (CRDM) thermal sleeves are examined under an augmented ISI inspection program. The scope of examination is to ultrasonically test (UT) the five (5) thermal sleeves with the worst wear on each unit. The plan for managing thermal sleeve wear is to obtain measured (UT) wear data points on each unit at the five (5) designated thermal sleeve reactor core locations during three (3) different outages. The frequency for inspection of the reactor vessel head thermal sleeve for loss of material due to wear will be re-evaluated after the accumulation of the three (3) data points on each of the five (5) designated thermal sleeves. The three (3) series of examinations will be performed prior to the period of extended operation. Subsequently, the required frequency for further inspections, if required, will be determined using the guidance provided in WCAP-16911-P, “Reactor Vessel Head Thermal Sleeve Wear Evaluation for Westinghouse Domestic Plants.

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program implements the required component examination schedule in accordance with ASME Section XI, Subsection IWB-2400, IWC-2400 or IWD-2400 and examination categories, applicable components, examination methods, acceptance standards, and frequency of examination as specified in Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1. The examination methods specified in Tables IWB-2500-1, IWC-2500-1 and IWD-2500-1 are based on approved industry standards for detecting age-related degradation of components. The program requires that indications and relevant conditions detected during examinations be evaluated in accordance with ASME Section XI, Articles IWB-3000 for Class 1, IWC-3000 for Class 2, and IWD-3000 for Class 3. The program directs that repair and replacement

activities be performed in conformance with IWA-4000. This condition-monitoring program provides adequate monitoring methods that are effective in detecting the relevant aging effects and the frequency of monitoring is adequate to prevent significant age-related degradation.

In accordance with 10 CFR 50.55a(g)(4)(ii), the ISI program is updated each successive 120-month inspection interval to comply with the requirements of the latest edition of the ASME Code specified twelve months before the start of the inspection interval.

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program includes all component inspection activities required by ***10 CFR 50.55a and*** ASME Code, Section XI, Subsections IWB, IWC, and IWD, ***and is supplemented by EPRI Maintenance Reliability Programs MRP-146, "Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant Branch Lines" and MRP-192 (Braidwood only), "Assessment of RHR Mixing Tee Thermal Fatigue in PWR Plants,"*** in conjunction with component types that are covered by the following license renewal aging management programs as described within the referenced aging management program bases documents listed below:

- Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components, B.2.1.5
- Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS), B.2.1.6
- PWR Vessel Internals, B.2.1.7
- Steam Generators, B.2.1.10
- One-Time Inspection of ASME Code Class 1 Small-Bore Piping, B.2.1.22

The program description of LRA Appendix B, Section B.2.1.9, on page B-67, is revised as shown below to provide additional detail regarding the aging management activities provided by the Bolting Integrity aging management program, as described in Item 2 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.9 Bolting Integrity

Program Description

The Bolting Integrity aging management program is an existing condition monitoring program. The program provides for aging management for loss of preload, cracking, and loss of material due to corrosion of closure bolting on pressure retaining joints within the scope of license renewal. The program includes closure bolting on pressure retaining joints in indoor air, outdoor air, air with borated water leakage, condensation, raw water, and soil. The Bolting Integrity program incorporates NRC and industry recommendations delineated in NUREG-1339, “Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants,” EPRI TR-104213, “Bolted Joint Maintenance & Applications Guide,” and EPRI NP-5769, “Degradation and Failure of Bolting in Nuclear Power Plants.”

The program generally includes periodic inspection of closure bolting, at least once per refueling cycle, for indications of loss of preload, cracking, and loss of material. The program credits visual inspection of pressure retaining bolted joints in ASME Class 1, 2, and 3 systems for leakage and age-related degradation during system pressure tests performed in accordance with ASME Section XI, 2001 Edition through the 2003 Addenda. In addition, the Bolting Integrity aging management program credits volumetric, surface, and visual inspections of ASME Class 1, 2, and 3 bolts, nuts, washers, and other associated bolting components performed in accordance with ASME Section XI, Subsections IWB, IWC, and IWD. The integrity of non-ASME (nonsafety-related) pressure retaining bolted joints (in non-ASME Class 1, 2, 3 and MC systems) is monitored by detection of visible leakage, evidence of past leakage, or other age-related degradation during maintenance activities and walkdowns in plant areas that contain systems within scope of license renewal. This program also includes visual inspections for loose or missing nuts and bolts and other conditions indicative of loss of preload and rust, corrosion byproducts, or other conditions indicative of loss of material. Inspection activities of closure bolting on pressure retaining joints within the scope of license renewal in submerged environments will be performed in conjunction with associated component maintenance activities. ***Additionally, the integral reactor vessel head assembly bolting is managed by this program.*** These monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant age-related degradation.

When pressure retaining bolted joint leakage or other age-related degradation is identified the condition is evaluated and entered into the corrective action program. The corrective action program is used to document and manage those components where leakage or age-related degradation is identified during routine observations, including walkdowns and maintenance activities. The leakage may be monitored for a change, repaired immediately or scheduled for repair based on the severity of the leak, the potential impact on plant operations, nuclear safety, or industrial safety. If leakage monitoring is required, the frequency will be based on the severity of the leak,

personnel safety, impact on plant operations, nuclear safety, radiation exposure, and other factors. If the leak rate changes, the monitoring frequency is re-evaluated and may be revised.

ASME Class 1, 2 and 3 pressure retaining bolted joint repairs are performed in accordance with the Exelon ASME Section XI Repair/Replacement Program. Flanged joint welding repairs and closure bolting replacements on pressure retaining joints are implemented in accordance with IWA-4000. Non-ASME pressure retaining bolting replacements and repairs follow the EPRI bolting guidelines (EPRI TR-104213), which includes proper bolt torquing and checking for uniformity of gasket compression after assembly.

High strength bolts (actual measured yield strength equal to or greater than 150 ksi) are not used on pressure retaining bolted joints within the scope of the Bolting Integrity program. The Bolting Integrity aging management program will be enhanced to include preventive measures to preclude or minimize stress corrosion cracking, by prohibiting the use of lubricants that contain molybdenum disulfide (MoS2) and prohibiting use of bolting material that has an actual measured yield strength of 150 ksi or greater in portions of systems that are within the scope of the Bolting Integrity program.

The Bolting Integrity aging management program is supplemented by the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.2.1.1) program, for inspection of safety-related closure bolting on pressure retaining joints. Inspection activities for closure bolting on pressure retaining joints in buried and underground environments are performed by the Buried and Underground Piping (B.2.1.28) program when closure bolting on pressure retaining joints are exposed by excavation.

The Primary Containment (MC) pressure bolting is managed as part of the ASME Section XI, Subsection IWE (B.2.1.29) program. The ASME Section XI, Subsection IWF (B.2.1.31) program manages ASME Class 1, 2, 3 and MC piping and component supports bolting. Structural bolting, other than ASME Class 1, 2, 3, and MC piping and component supports is managed as part of the Structures Monitoring (B.2.1.34) program and R.G. 1.127, Inspection of Water Control Structures Associated With Nuclear Power Plants (B.2.1.35) program. Crane and hoist bolting is managed by the Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.2.1.13) program. The heating and ventilation system bolting is managed by the External Surfaces Monitoring of Mechanical Components (B.2.1.23) program. Reactor head closure bolting is managed by the Reactor Head Closure Stud Bolting (B.2.1.3) program. The above bolting is not included in the Bolting Integrity Program.

As a result of the response to RAI 3.0.3-2c provided in Enclosure A of this letter and to provide additional detail regarding the aging management activities provided by the Open-Cycle Cooling Water System aging management program, as described in Item 3 of Enclosure B, the Program Description section of LRA Appendix B, Section B.2.1.11, on page B-82, is revised as shown below. Inserted text is highlighted by ***bolded italics***. Deleted text is highlighted by ~~strikethroughs~~. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.11 Open-Cycle Cooling Water System

Program Description

The Open-Cycle Cooling Water System (OCCWS) aging management program is an existing preventive, mitigative, condition monitoring, and performance monitoring program that manages heat exchangers, piping, piping elements, and piping components in safety-related and nonsafety-related raw water systems that are exposed to a raw water environment for loss of material, loss of coating integrity, and reduction of heat transfer. The activities for this program are consistent with the site commitments to the requirements of GL 89-13 and provide for management of aging effects in raw water cooling systems through tests, inspections, and component cleaning. System and component testing, visual inspections, non-destructive examination (NDE) (i.e., ultrasonic testing and eddy current testing), and biocide and chemical treatment are conducted to ensure that identified aging effects are managed such that system and component intended functions are maintained.

The OCCWS includes those systems that transfer heat from safety-related systems, structures, and components to the ultimate heat sink as defined in GL 89-13 as well as those raw water systems which are in scope for license renewal for potential spatial interaction but have no safety-related heat transfer function.

The guidelines of GL 89-13 are utilized for the surveillance and control of bio-fouling for the OCCWS aging management program. Procedures provide instructions and controls for chemical and biocide injection. Periodic inspections are performed for the presence of Asiatic clams, bryozoa (Braidwood only), and mollusks and biocide treatments are applied as necessary.

Periodic heat transfer testing, visual inspection and cleaning of safety-related heat exchangers with a heat transfer intended function is performed in accordance with the site commitments to GL 89-13 to verify heat transfer capabilities. Additionally, safety-related piping segments are tested periodically to ensure that there is no significant loss of material, which could cause a loss of intended function. ~~Nonsafety-related piping segments have potential for spatial interactions with safety-related equipment, and will be NDE tested periodically as delineated in the enhancement described below.~~

Safety-related and nonsafety-related piping inspections are performed using a 100% scan ultrasonic testing method, where possible, to ensure that localized corrosion indicative of microbiologically influenced corrosion (MIC) is detected. The inspections required by this program are performed at locations that are chosen to be leading indicators of the material condition of the internal surface of components within the scope of the program. The specific locations for inspections are chosen based on

commitments made in the Byron and Braidwood responses to NRC GL 89-13, piping configuration, flow conditions (e.g., stagnant or low flow areas), and operating history (e.g., prior inspection results). The maximum interval for re-inspection is based on the calculated remaining life of the component. If required, piping replacement is performed prior to the development of through-wall leakage.

Periodic inspections of nonsafety-related heat exchangers, piping and piping components (including deep well pumps at Byron only) are performed to manage aging effects. In scope, nonsafety-related heat exchangers do not have heat transfer intended functions, therefore, no heat transfer testing is performed. Nonsafety-related piping segments which have the potential for spatial interaction with safety-related equipment will be NDE tested periodically as delineated in Enhancement 1.

Routine inspections and maintenance ensure that corrosion, erosion, sediment deposition (silting), scaling (Braidwood only), and bio-fouling do not degrade the performance of safety-related systems serviced by OCCWS aging management program.

No credit is taken for protective coatings on safety-related components in the OCCWS aging management program in determining potential aging effects. However, this program is used to assure the lining/coating integrity. At Byron and Braidwood, protective coatings are utilized on selected safety-related and nonsafety-related heat exchangers within the scope of this program and are periodically inspected and repaired, as necessary. Periodic visual inspections of the internal coatings of components within the scope of this program are performed every one to six years, depending on the heat exchanger. The visual inspections ensure that loss of coating integrity is detected prior to (1) loss of component intended function, including loss of function due to accelerated degradation caused by localized coating failures, and (2) degradation of downstream component performance due to flow blockage.

Inspections of internal coatings will be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. The as found condition of the coating is documented in inspection reports and the results of prior inspections are reviewed to determine changes in the condition of the coating over time. The program provides for inspections for signs of coating failures and precursors to coating failures including erosion, cracking, flaking, peeling, blistering, delamination, rusting, and mechanical damage. Evidence of unacceptable coating degradation is entered into the corrective action program. Coating inspection acceptance criteria will specify that peeling, blistering, and delamination is not acceptable. Signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program. If peeling, blistering, or delamination is detected and the coating is not repaired or replaced, then physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal and the as-left condition of the coating will be such that the potential for further degradation of the coating is minimized (i.e., any loose coating is removed, the edge of the remaining coating is feathered). The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). A minimum of three (3) sample points adjacent to the defective area will be tested. Indications of blisters, cracking, flaking, or rusting will be assessed by a certified coatings inspector and documented in a post-inspection report. Areas or

items exhibiting coating degradation will be documented, photographed, and reported to the ASTM D7108 qualified Site Coating Coordinator in a post-inspection report. Recommendations for immediate coating repair or replacement prior to returning the system to service or postponement of coating repair or replacement to the next inspection window will be provided in the post-inspection report. The results of the inspection contained in the post-inspection report will be evaluated by the ASTM D7108 qualified Site Coating Coordinator. Evaluations used to determine whether repair or replacement of coatings exhibiting signs of peeling, blistering, or delamination are required prior to returning the component to service will consider the potential impact on the system, including degraded performance of downstream components due to flow blockage and loss of material of the coated component. ***Furthermore, if peeling or delamination is identified and the component is returned to service without repair or replacement of the coating, then either, (1) repair or replacement of the coating will be performed within two years from when the degraded condition was detected or, (2) follow-up inspections of the degraded coating will be performed within two years from when the degraded condition was detected and then again by the end of the following two-year interval to verify that the peeling or delamination is not propagating.*** The results of inspections of internal coatings are trended and used to adjust inspection frequencies as determined by the ASTM D7108 qualified Site Coating Coordinator. 100% of the coated surfaces that are accessible upon component disassembly or entry are inspected. At least one inspection of each of the coated heat exchangers within the scope of this program will be performed during the ten (10) years prior to the period of extended operation to establish a baseline. Evaluations are performed for inspections that do not satisfy established criteria and the conditions are entered into the 10 CFR 50 Appendix B corrective action program. The corrective action program ensures that conditions adverse to quality are promptly corrected. Corrective actions may include performing coating repairs or replacements prior to the component being returned to service.

The Buried and Underground Piping (B.2.1.28) aging management program activities are adequate for managing the aging effects of external surfaces of buried and underground piping and components. The external surface of the aboveground raw water piping and heat exchangers is managed by the External Surfaces Monitoring of Mechanical Components (B.2.1.23) aging management program. However, the internal and external surfaces of the piping exposed to raw water in the Essential Service Water Cooling Tower (Byron only) will be managed by the Open-Cycle Cooling Water System program.

Examination of polymeric materials in systems serviced by the Open-Cycle Cooling Water System program will be consistent with examinations described in the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.25) aging management program.

As a result of the responses to RAI 3.0.3-2c and RAI B.2.1.16-1c provided in Enclosure A of this letter, LRA Appendix B, Section B.2.1.16, B-109, is revised as shown below. Text inserted as a result of the responses to RAI 3.0.3-2c and RAI B.2.1.16-1c is highlighted by ***bolded italics***. Deleted text is highlighted by ~~strikethroughs~~. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.16 Fire Water System

Program Description

The Fire Water System aging management program is an existing condition monitoring program that manages the loss of material aging effect for the water-based fire protection system and associated components, through the use of system pressure monitoring, system header flushing, buried ring header flow testing, pump performance testing, hydrant full flow flushing and full flow verification, sprinkler and deluge system flushing and flow testing, hydrostatic testing, and inspection activities. This program manages aging effects of loss of material due to corrosion (including MIC), reduction in heat transfer due to fouling, and flow blockage due to fouling. In addition, the Fire Water System aging management program manages the loss of coating integrity aging effect for the components with internal coatings within the scope of the program.

The program applies to water-based fire protection systems that consist of sprinklers, fittings, valves, hydrants, hose stations, standpipes, tanks, pumps, and aboveground and buried piping and components. The program manages aging of fire protection components exposed to outdoor air and raw water. There are no underground (i.e., below grade but contained within a tunnel or vault) piping and components within the scope of the Fire Water System aging management program at Byron and Braidwood Stations. Aging of the external surfaces of buried fire main piping is managed as described in the Buried and Underground Piping (B.2.1.28) aging management program.

The fire water system is maintained at the required normal operating pressure and monitored such that a loss of system pressure is immediately detected and corrective actions initiated. The program ensures that testing and inspection activities are performed and the results are documented and reviewed by the Fire Protection system manager for analysis and trending. These monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant age-related degradation.

Opportunistic visual inspections, performed when the internal surface is made accessible due to normal plant maintenance activities, and ~~existing~~ volumetric non-destructive examinations (i.e., guided wave***, radiographic testing,*** and ultrasonic inspection) of piping will be credited to ensure age related degradation is identified prior to loss of system intended function. Selected portions of the fire protection system piping located aboveground and exposed to water will be inspected by non-intrusive volumetric examinations, to ensure that aging effects are managed and that pipe wall thickness is within acceptable limits. ~~Pipe wall thickness inspections will be performed before the end of the current operating term and continued at a frequency of at least once every 3 years during the period of extended operation.~~ ***Fire Protection System piping is risk ranked based on susceptibility to corrosion and consequences of leaks to determine locations for inspection. When volumetric examinations of Fire Protection System piping are performed and***

degradation is identified, additional inspections are performed in accordance with the following criteria:

- ***at least four (4) additional locations will be examined if wall loss is greater than 50 percent of nominal wall thickness,***
- ***two (2) additional locations will be examined if wall loss is 30 percent to 50 percent of nominal wall thickness and the calculated remaining life is less than two (2) years,***
- ***no additional examinations are required if wall loss is less than 30 percent of nominal wall thickness.***

Existing pipe wall thickness measurements are performed at least once every three (3) years. However, the program does not define a minimum number of volumetric examinations. Therefore, to ensure that sufficient volumetric examinations are performed such that age-related degradation is identified prior to loss of intended function, the Fire Water System program will be enhanced to require a minimum of 25 volumetric examinations, using radiographic testing or ultrasonic testing, every ten (10) years at both Byron and Braidwood independent of plant-specific operating experience. At Byron only, as a result of operating experience, the program will be enhanced to require a minimum of 30 volumetric examinations***, using radiographic testing or ultrasonic testing,*** during each three year interval ***to address recurring internal corrosion (RIC) due to MIC***. ***If volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50 percent, then RIC is no longer occurring and this minimum sample size is no longer required.***

~~These~~ ***The*** inspections ***described above*** will be capable of evaluating pipe wall thickness to ensure against loss of system intended function. Wall thickness evaluations will not be used in lieu of conducting flow tests or inspections for flow blockage. The program will be enhanced to perform additional inspections as described in the Enhancements below. Internal visual inspections or radiographic testing will be performed at the end of one (1) fire main and the end of one (1) branch line on half of the wet pipe sprinkler system every five (5) years. The wet pipe sprinkler systems that are not inspected during a five (5) year period will be inspected during the subsequent five (5) year period. Internal visual inspections are primarily relied upon for detection of flow blockage. Internal visual inspections are only capable of providing qualitative assessments of the internal condition of system piping with respect to loss of material. If unexpected levels of degradation are identified then the condition is entered into the corrective action program for evaluation. Unexpected levels of degradation include excessive accumulation of corrosion products and appreciable localized corrosion (e.g., pitting) beyond a normal oxide layer.

In addition, periodic visual inspections of components with internal coatings are performed. The visual inspections ensure that loss of coating integrity is detected prior to (1) loss of component intended function, including loss of function due to accelerated degradation caused by localized coating failures, and (2) degradation of downstream component performance due to flow blockage. Inspections of internal coatings will be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. The as found condition of the coating is documented in inspection reports and the results of prior inspections are reviewed to determine changes in the condition of the coating over time. The program provides for

inspections for signs of coating failures and precursors to coating failures including erosion, cracking, flaking, peeling, blistering, delamination, rusting, and mechanical damage. Evidence of unacceptable coating degradation is entered into the corrective action program. Coating inspection acceptance criteria will specify that peeling, blistering, and delamination is not acceptable. Signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program. If peeling, blistering, or delamination is detected and the coating is not repaired or replaced, then physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal and the as-left condition of the coating will be such that the potential for further degradation of the coating is minimized (i.e., any loose coating is removed, the edge of the remaining coating is feathered). The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). A minimum of three (3) sample points adjacent to the defective area will be tested. Indications of blisters, cracking, flaking, or rusting will be assessed by a certified coatings inspector and documented in a post-inspection report. Areas or items exhibiting coating degradation will be documented, photographed, and reported to the ASTM D7108 qualified Site Coating Coordinator in a post-inspection report. Recommendations for immediate coating repair or replacement prior to returning the system to service or postponement of coating repair or replacement to the next inspection window will be provided in the post-inspection report. The results of the inspection contained in the post-inspection report will be evaluated by the ASTM D7108 qualified Site Coating Coordinator. Evaluations used to determine whether repair or replacement of coatings exhibiting signs of peeling, blistering, or delamination are required prior to returning the component to service will consider the potential impact on the system, including degraded performance of downstream components due to flow blockage and loss of material of the coated component. ***Furthermore, if peeling or delamination is identified and the component is returned to service without repair or replacement of the coating, then either, (1) repair or replacement of the coating will be performed within two years from when the degraded condition was detected or, (2) follow-up inspections of the degraded coating will be performed within two years from when the degraded condition was detected and then again by the end of the following two-year interval to verify that the peeling or delamination is not propagating.*** The results of inspections of internal coatings are trended and used to adjust inspection frequencies as determined by the ASTM D7108 qualified Site Coating Coordinator. 100% of the coated surfaces that are accessible upon component disassembly or entry are inspected. At least one inspection of each of the coated foam concentrate tanks within the scope of this program will be performed during the ten (10) years prior to the period of extended operation to establish a baseline. Evaluations are performed for inspections that do not satisfy established criteria and the conditions are entered into the 10 CFR 50 Appendix B corrective action program. The corrective action program ensures that conditions adverse to quality are promptly corrected. Corrective actions may include performing coating repairs or replacements prior to the component being returned to service.

At Braidwood only, periodic visual inspections of the traveling screens located upstream of the fire pumps are performed during diver inspections of 1A and 2A intake bays.

Buried ring header flow tests measure hydraulic resistance and compare results with previous testing as a means of evaluating the internal piping conditions. Monitoring

system piping flow characteristics ensures that signs of loss of material will be detected in a timely manner.

50-year sprinkler head testing will be conducted using the guidance provided in NFPA 25. Performance of the initial 50-year tests will be determined based on the date of the sprinkler system installation. Subsequent inspections will be performed every 10 years after the initial 50-year testing.

At Byron only, as a result of operating experience, an enhancement to allow for chemical addition, accompanied with system flushing to allow for adequate dispersal of the chemicals throughout the system, to prevent or minimize microbiologically induced corrosion has been included in the Fire Water System aging management program. In addition, the program is enhanced to require a minimum of 30 volumetric examinations during each three year interval to address Byron operating experience.

System functional tests, flow tests (including air flow tests), flushes, and inspections are performed in accordance with the applicable guidance from National Fire Protection Association (NFPA) codes and standards. The program will be enhanced to include annual main drain testing in accordance with NFPA 25, Section 13.2.5. These activities are performed periodically to ensure that the loss of material due to corrosion aging effect is managed such that the system and component intended functions are maintained.

For portions of the water-based fire protection system that are: (a) normally dry but periodically subjected to flow and (b) cannot be drained or allow water to collect the Fire Water System (B.2.1.16) aging management program will be enhanced to require augmented testing beyond that specified in NFPA 25. Augmented testing of these portions of the water-based fire protection system will be performed as follows:

a. Full flow testing at the design pressure and flow rate or internal visual inspections of the internal surface of portions of the system that meet the above criteria will be periodically performed to ensure flow blockage is not occurring. In addition, volumetric examinations will be performed to verify that significant loss of material is not occurring.
b. Flow testing and visual inspections will be capable of detecting flow blockage. Volumetric examinations will measure wall thickness and detect age-related loss of material.
c. Inspections and testing will commence five (5) years prior to the period of extended operation and will be conducted on a five (5) year frequency thereafter.
d. Flow testing and visual inspections will monitor for flow blockage in 100% of the applicable portions of the water-based fire protection system. Volumetric examinations will be performed on 20% of the applicable portions of the water-based fire protection system. The 20% of piping that is inspected in each five year interval will be in different locations than previously inspected.
e. Reduction in flow such that the system is not capable of performing its intended function will be entered into the corrective action program. Wall thickness measurements below nominal wall thickness will be entered into the corrective action program.

NUREG-1801 Consistency

The Fire Water System aging management program will be consistent with the ten

elements of aging management program XI.M27, “Fire Water System,” specified in NUREG-1801.

Exceptions to NUREG-1801

None.

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

1. Replace sprinkler heads or perform 50-year sprinkler head testing using the guidance of NFPA 25 “Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems” (2002 Edition), Section 5.3.1.1.1. This testing will be performed at the 50- year in-service date and every 10 years thereafter. **Program Elements Effected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**

2. Provide for chemical addition, accompanied with system flushing to allow for adequate dispersal of the chemicals throughout the system, to prevent or minimize microbiologically induced corrosion (Byron only). **Program Elements Effected: Preventive Actions (Element 2)**

3. Perform main drain testing annually, in accordance with NFPA 25, “Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems,” Section 13.2.5. **Program Elements Effected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**

4. Perform air flow testing of deluge systems that are not subject to periodic full flow testing on a three (3) year frequency to verify that internal flow blockage is not occurring (Byron only). **Program Elements Effected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**

5. Perform inspections of Fire Protection System strainers when the system is reset after automatic actuation for signs of internal flow blockage (e.g., buildup of corrosion particles) (Braidwood only). **Program Elements Effected: Detection of Aging Effects (Element 4)**

6. Increase the frequency of visual inspections of the internal surface of the foam concentrate tanks to at least once every ten (10) years. At least one (1) inspection will be performed within the ten (10) year period prior to entry into the period of extended operation, with subsequent inspections performed every ten (10) years thereafter. **Program Elements Effected: Detection of Aging Effects (Element 4)**

7. Perform radiographic testing or internal visual inspections every five (5) years at the end of one (1) fire main and the end of one (1) sprinkler system branch line in half of the wet pipe sprinkler system within the scope of license renewal. If internal flow blockage that could result in failure of the system to deliver the required flow is identified, then perform an obstruction investigation. **Program Elements Effected: Detection of Aging Effects**

(Element 4)

8. Perform augmented testing beyond that specified in NFPA 25 on those portions of the water-based fire protection system that are: (a) normally dry but periodically subjected to flow and (b) cannot be drained or allow water to collect. The augmented testing will include: (1) periodic full flow tests at the design pressure and flow rate or internal visual inspections and (2) volumetric wall-thickness examinations. Inspections and testing will commence five (5) years prior to the period of extended operation and will be conducted on a five (5) year frequency thereafter. **Program Elements Effected: Scope of Program (Element 1), Detection of Aging Effects (Element 4)**

9. Perform a minimum of 30 volumetric examinations of Fire Protection System piping***, using radiographic testing or ultrasonic testing,*** during each three year interval***. If volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50 percent, then this minimum sample size is no longer required.*** (Byron only)~~.~~ **Program Elements Effected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**

10. Require inspections of internal coatings be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. **Program Elements Affected: Detection of Aging Effects (Element 4)**

11. Specify that signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program. **Program Elements Affected: Acceptance Criteria (Element 6)**

12. Require physical testing of internal coatings, where physically possible, to ensure that remaining coating is tightly bonded to the base metal when peeling, blistering or delamination is detected and the coating is not repaired or replaced. The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). **Program Elements Affected: Acceptance Criteria (Element 6)**

13. Require that evaluations utilized to return a coated component exhibiting signs of peeling, blistering, or delamination to service without repairing or replacing the coating shall consider the potential impact on the intended function of the system. This evaluation shall include consideration of the potential for degraded performance of downstream components due to flow blockage and loss of material of the coated component. **Program Elements Affected: Monitoring and Trending (Element 5), Acceptance Criteria (Element 6), Corrective Actions (Element 7)**

14. Require the as-left condition of a coating that exhibited signs of peeling, blistering, or delamination and that is not repaired or replaced is such that the potential for further degradation of the coating is minimized. **Program Elements Affected: Monitoring and Trending (Element 5), Corrective Actions (Element 7)**

15. ***Perform a minimum of 25 volumetric examinations of Fire Protection System piping, using radiographic testing or ultrasonic testing, during each 10-year interval. Program Elements Effected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)***

As a result of the response to RAI 3.0.3-2c provided in Enclosure A of this letter, the Program Description section of LRA Appendix B, Section B.2.1.18, on page B-121, is revised as shown below. Text inserted as a result of the response to RAI 3.0.3-2c is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.18 Fuel Oil Chemistry

Program Description

The Fuel Oil Chemistry program is an existing mitigative and condition monitoring program that manages loss of material, loss of coating integrity, and reduction in heat transfer in piping, piping elements, piping components, tanks, and heat exchangers in a fuel oil environment. The Fuel Oil Chemistry aging management program relies on a combination of surveillance procedures and maintenance activities being implemented to provide assurance that contaminants are monitored and controlled in fuel oil for systems and components within the scope of license renewal. The program requires fuel oil parameters to be maintained at acceptable levels in accordance with Technical Specifications, Technical Requirement Manual, and ASTM Standards (ASTM D 0975-98/-06b, D 2709-96e, D 4057-95, and D 5452-98). Fuel oil sampling and analysis is performed in accordance with approved procedures for new and stored fuel oil. Monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant age-related degradation. Fuel oil tanks are periodically drained of accumulated water, cleaned, and internally inspected to minimize exposure to fuel oil contaminants. During these inspections, the internal coatings of the tanks are visually inspected to ensure that loss of coating integrity is detected prior to (1) loss of component intended function, including loss of function due to accelerated degradation caused by localized coating failures, and (2) degradation of downstream component performance due to flow blockage. These activities effectively manage the effects of aging by maintaining contaminants at acceptably low concentrations.

Inspections of internal coatings will be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. The as found condition of the coating is documented in inspection reports and the results of prior inspections are reviewed to determine changes in the condition of the coating over time. The program provides for inspections for signs of coating failures and precursors to coating failures including erosion, cracking, flaking, peeling, blistering, delamination, rusting, and mechanical damage. Evidence of unacceptable coating degradation is entered into the corrective action program. Coating inspection acceptance criteria will specify that peeling, blistering, and delamination is not acceptable. Signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program. If peeling, blistering, or delamination is detected and the coating is not repaired or replaced, then physical testing will be conducted to ensure that the remaining coating is tightly bonded to the base metal and the as-left condition of the coating will be such that the potential for further degradation of the coating is minimized (i.e., any loose coating is removed, the edge of the remaining coating is feathered). The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). A minimum of three (3) sample points adjacent to the defective area will be tested. Indications of blisters, cracking, flaking, or rusting will be assessed by a

certified coatings inspector and documented in a post-inspection report. Areas or items exhibiting coating degradation will be documented, photographed, and reported to the ASTM D7108 qualified Site Coating Coordinator in a post-inspection report. Recommendations for immediate coating repair or replacement prior to returning the system to service or postponement of coating repair or replacement to the next inspection window will be provided in the post-inspection report. The results of the inspection contained in the post-inspection report will be evaluated by the ASTM D7108 qualified Site Coating Coordinator. Evaluations used to determine whether repair or replacement of coatings exhibiting signs of peeling, blistering, or delamination are required prior to returning the component to service will consider the potential impact on the system, including degraded performance of downstream components due to flow blockage and loss of material of the coated component. ***Furthermore, if peeling or delamination is identified and the component is returned to service without repair or replacement of the coating, then either, (1) repair or replacement of the coating will be performed within two years from when the degraded condition was detected or, (2) follow-up inspections of the degraded coating will be performed within two years from when the degraded condition was detected and then again by the end of the following two-year interval to verify that the peeling or delamination is not propagating.*** The results of inspections of internal coatings are trended and used to adjust inspection frequencies as determined by the ASTM D7108 qualified Site Coating Coordinator. 100% of the coated surfaces that are accessible upon component disassembly or entry are inspected. At least one inspection of each of the coated fuel oil storage tanks within the scope of this program will be performed during the ten (10) years prior to the period of extended operation to establish a baseline. Evaluations are performed for inspections that do not satisfy established criteria and the conditions are entered into the 10 CFR 50 Appendix B corrective action program. The corrective action program ensures that conditions adverse to quality are promptly corrected. Corrective actions may include performing coating repairs or replacements prior to the component being returned to service. In addition, the instrumentation and alarms related to emergency diesel generator fuel oil storage tank level and fuel oil transfer pump suction strainer differential pressure are monitored. Monitoring of instrumentation related to the emergency diesel generator fuel oil storage tank ensures that an adequate fuel oil supply is available such that the intended functions of the emergency diesel generators are maintained. High differential pressure across the fuel oil transfer pump suction strainer would provide indication if any significant degradation of the coating were to occur and cause coating debris to enter the fuel oil transfer system.

The Program Description section of LRA Appendix B, Section B.2.1.20, on page B-132, is revised as shown below to provide additional detail regarding the aging management activities provided by the One-Time Inspection aging management program, as described in Item 4 of Enclosure B. Deleted text is highlighted by ~~strikethroughs~~. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.20 One-Time Inspection

Program Description

The One-Time Inspection aging management program is a new condition monitoring program that will be used to verify the system-wide effectiveness of the Water Chemistry (B.2.1.2), Fuel Oil Chemistry (B.2.1.18), and Lubricating Oil Analysis (B.2.1.26) aging management programs which are designed to prevent or minimize age-related degradation so that there will not be a loss of intended function during the period of extended operation. The program manages loss of material, cracking, and reduction of heat transfer in piping, piping components, piping elements, tanks, pump casings, heat exchangers, and other components within the scope of license renewal for air-outdoor, fuel oil, lubricating oil, reactor coolant, steam, treated water, and treated borated water environments. The program identifies inspections focused on locations that are isolated from the flow stream, that are stagnant, or have low flow for extended periods and are susceptible to the gradual accumulation or concentration of agents that promote certain aging effects. A representative sample size of 20 percent of the population (up to a maximum of 25 component inspections) will be established for each of the sample groups and will focus on the bounding or lead components most susceptible to aging due to time in service, and severity of operating conditions. The program verifies either no unacceptable age-related degradation is occurring or triggers additional actions that will assure the intended function of affected components will be maintained during the period of extended operation. Technical justification of the methodology and sample size used for selecting components for one-time inspection is documented in the One-Time Inspection Sample Basis Document.

The One-Time Inspection aging management program will also be utilized, in specific cases where existing data is insufficient:

a) to validate that a particular aging effect is not occurring, or
b) to verify that the aging effect is occurring slowly enough to not affect a components intended function during the period of extended operation.

In these cases, the components will not require additional aging management. The One-Time Inspection aging management program will include inspections of insulated and uninsulated ~~air-filled or gas-filled~~ stainless steel or aluminum alloy piping and components located outdoors to verify that stress corrosion cracking is not occurring or is occurring slowly enough to not affect a components intended function during the period of extended operation.

The elements of the program include (a) determination of the sample size of components to be inspected based on an assessment of materials of fabrication, environment, plausible aging effects, and plant-specific and industry operating experience, (b) identification of the inspection locations in the system or component based on the potential for the aging effect to occur, (c) determination of the examination technique, including acceptance criteria that would be effective in

managing the aging effect for which the component is examined, and (d) an evaluation of the need for follow-up examinations to monitor the progression of aging if age-related degradation is found that could adversely impact an intended function before the end of the period of extended operation. The monitoring methods will be effective in detecting the applicable aging effects and the frequency of monitoring will be adequate to prevent significant age-related degradation.

This program is not used for systems or components with known age-related degradation or when the environment in the period of extended operation is not expected to be equivalent to that in the prior 40 years. Periodic inspections will be used in these cases.

The One-Time Inspection program will be implemented prior to the period of extended operation. The one-time inspections will be performed within the 10 year period prior to the period of extended operation.

The Enhancements section of LRA Appendix B, Section B.2.1.31, on page B-209, is revised to add Enhancement 6 as shown below. The new enhancement provides additional information regarding the aging management activities provided by the ASME Section XI, Subsection IWF aging management program, as described in Item 5 of Enclosure B. Inserted text is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

B.2.1.31 ASME Section XI, Subsection IWF

Enhancements

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

6. ***Add the control rod drive mechanism seismic support assembly to the scope of the program to implement additional examinations. Program Elements Affected: Scope of Program (Element 1)***

Enclosure D

Byron and Braidwood Stations (BBS) Units 1 and 2 License Renewal Commitment List Changes

This Enclosure identifies commitments made or revised in this document and is an update to the Byron and Braidwood Station (BBS) LRA Appendix A, Table A.5 License Renewal Commitment List. Any other actions discussed in the submittal represent intended or planned actions and are described to the NRC for the NRC's information and are not regulatory commitments. Changes to the BBS LRA Appendix A, Table A.5 License Renewal Commitment List are as a result of the Exelon response to the following RAI:

RAI B.2.1.16-1c

In addition, this Enclosure includes updates to the BBS LRA Appendix A, Table A.5 License Renewal Commitment List as indicated in Enclosure B.

Notes:

- To facilitate understanding, portions of the original License Renewal Commitment List have been repeated in this Enclosure, with revisions indicated.
- Existing LRA text, as modified by previous RAI responses, is shown in normal font. Additions are highlighted with ***bolded italics***.

As a result of the response to RAI B.2.1.16-1c provided in Enclosure A of this letter, LRA Appendix A, Table A.5 License Renewal Commitment List, line item 16, on page A-76, is revised as shown below. Text inserted as a result of the response to RAI B.2.1.16-1c is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.5 LICENSE RENEWAL COMMITMENT LIST

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
16	Fire Water System	Fire Water System is an existing program that will be enhanced to: 1. Replace sprinkler heads or perform 50-year sprinkler head testing using the guidance of NFPA 25 "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems" (2002 Edition), Section 5.3.1.1.1. This testing will be performed at the 50-year in-service date and every 10 years thereafter. 2. Provide for chemical addition accompanied with system flushing to allow for adequate dispersal of the chemicals throughout the system, to prevent or minimize microbiologically induced corrosion (Byron only) [Note 3]. 3. Perform main drain testing annually, in accordance with NFPA 25, "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems," Section 13.2.5. 4. Perform air flow testing of deluge systems that are not subject to periodic full flow testing on a three (3) year frequency to verify that internal flow blockage is not occurring (Byron only)[Note 1]. 5. Perform inspections of Fire Protection System strainers when the system is reset after automatic actuation for signs of internal flow blockage (e.g., buildup of corrosion particles) (Braidwood only)[Note 1]. 6. Increase the frequency of visual inspections of the internal surface of the foam concentrate tanks to at least once every ten (10) years. At least one (1) inspection will be performed within the ten (10) year period prior to entry into the period of extended operation, with subsequent inspections performed every ten (10) years thereafter.	Program to be enhanced prior to the period of extended operation. Inspection schedule identified in commitment.	Section A.2.1.16 Exelon letter RS-14-078 03/13/2014 RAI B.2.1.16-1 RAI B.2.1.16-2 Exelon letter RS-14-169 06/16/2014 RAI B.2.1.16-1a Exelon letter RS-14-175 06/30/2014 RAI 3.0.3-2b ***Exelon letter RS-14-235 08/29/2014*** ***RAI B.2.1.16-1c***

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
		7. Perform radiographic testing or internal visual inspections every five (5) years at the end of one (1) fire main and the end of one (1) sprinkler system branch line in half of the wet pipe sprinkler system within the scope of license renewal. If internal flow blockage that could result in failure of the system to deliver the required flow is identified, then perform an obstruction investigation. 8. Perform augmented testing beyond that specified in NFPA 25 on those portions of the water-based fire protection system that are: (a) normally dry but periodically subjected to flow and (b) cannot be drained or allow water to collect. The augmented testing will include: (1) periodic full flow tests at the design pressure and flow rate or internal visual inspections and (2) volumetric wall-thickness examinations. Inspections and testing will commence five (5) years prior to the period of extended operation and will be conducted on a five (5) year frequency thereafter. 9. Perform a minimum of 30 volumetric examinations of Fire Protection System piping***, using radiographic testing or ultrasonic testing,*** during each three year interval***. If volumetric examinations over a 10-year interval do not identify three (3) or more areas exhibiting reduction in wall thickness greater than 50 percent, then this minimum sample size is no longer required.*** (Byron only)[Note 3]. 10. Require inspections of internal coatings be performed by coating inspectors certified to ANSI N45.2.6 or ASTM Standards endorsed in Regulatory Guide 1.54. 11. Specify that signs of peeling, blistering, or delamination of the coating from the base metal, if identified, shall be entered into the corrective action program. 12. Require physical testing of internal coatings, where physically possible, to ensure that remaining coating is tightly bonded to the base metal when peeling, blistering, or delamination is detected and the coating is not repaired or replaced. The testing will consist of adhesion testing using ASTM International standards endorsed in RG 1.54 (e.g., ASTM D4541-09 or ASTM D6677-07). 13. Require that evaluations utilized to return a coated component		

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
		exhibiting signs of peeling, blistering, or delamination to service without repairing or replacing the coating shall consider the potential impact on the intended function of the system. This evaluation shall include consideration of the potential for degraded performance of downstream components due to flow blockage and loss of material of the coated component. 14. Require the as-left condition of a coating that exhibited signs of peeling, blistering, or delamination and that is not repaired or replaced is such that the potential for further degradation of the coating is minimized. ***15. Perform a minimum of 25 volumetric examinations of Fire Protection System piping, using radiographic testing or ultrasonic testing, during each 10-year interval.***		

As a result of the revision described in Item 5 of Enclosure B of this letter, LRA Appendix A, Table A.5 License Renewal Commitment List, line item 31, on page A-84, is revised to add Enhancement 6 as shown below. Text inserted as a result of this revision is highlighted by ***bolded italics***. Existing text from the LRA, as modified by subsequent submittals, is shown in normal font.

A.5 LICENSE RENEWAL COMMITMENT LIST

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
31	ASME Section XI, Subsection IWF	ASME Section XI, Subsection IWF is an existing program that will be enhanced to: ***6. Add the control rod drive mechanism seismic support assembly to the scope of the program to implement additional examinations.***	Program to be enhanced and one-time volumetric examinations to be performed prior to the period of extended operation.	Section A.2.1.31 Exelon Letter RS-14-052 03/04/2014 RAIs B.2.1.31-1 B.2.1.31-2 B.2.1.31-3 Exelon Letter RS-14-170 06/16/2014 RAI B.2.1.31-1a ***Exelon Letter RS-14-235 08/29/2014***