



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

June 16, 2017

Mr. Joel P. Gebbie  
Senior VP and Chief Nuclear Officer  
Indiana Michigan Power Company  
Nuclear Generation Group  
One Cook Place  
Bridgman, MI 49106

**SUBJECT: DONALD C. COOK NUCLEAR POWER PLANT, UNIT 2 – NRC POST-APPROVAL  
SITE INSPECTION FOR LICENSE RENEWAL 05000316/2017009**

Dear Mr. Gebbie:

On May 19, 2017, the U.S. Nuclear Regulatory Commission completed a Post-Approval Site Inspection for License Renewal at your Donald C. Cook Nuclear Power Plant, Unit 2. The enclosed report documents the results of this inspection as discussed on May 19, 2017, with you, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, performed walkdowns, and interviewed personnel.

Based on the sample selected for review, there were no findings of significance identified during this inspection.

We reviewed implementation of all 42 Commitment Items. The inspectors concluded that the actions associated with all 42 Commitment Items were properly identified, implemented, and completed.

The inspectors determined that you have adequately followed your commitment change process and have tracking mechanisms in place to ensure all actions are completed before the period of extended operation. On these bases and in consultation with the Division of License Renewal in the Office of Nuclear Reactor Regulation, operation into the period of extended operation is acceptable.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Mark T. Jeffers, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket No. 50-316  
License No. DPR-74

Enclosure:  
IR 05000316/2017009

cc: Distribution via LISTSERV®

Letter to Joel P. Gebbie from Mark T. Jeffers dated June 16, 2017

SUBJECT: DONALD C. COOK NUCLEAR POWER PLANT, UNIT 2 – NRC POST-APPROVAL  
SITE INSPECTION FOR LICENSE RENEWAL 05000316/2017009

DISTRIBUTION:

Jeremy Bowen  
RidsNrrDorLpl3  
RidsNrrPMDCCook Resource  
RidsNrrDirslrib Resource  
Cynthia Pederson  
Darrell Roberts  
Richard Skokowski  
Allan Barker  
Carole Ariano  
Linda Linn  
DRPIII  
DRSIII  
[ROPreports.Resource@nrc.gov](mailto:ROPreports.Resource@nrc.gov)

ADAMS Accession Number ML17170A326

OFFICE	RIII	RIII	RIII	RIII
NAME	BJose:cl	MJeffers		
DATE	06/15/17	06/16/17		

**OFFICIAL RECORD COPY**

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 05000316  
License No: DPR-74

Report No: 05000316/2017009

Licensee: Indiana Michigan Power Company

Facility: Donald C. Cook Nuclear Power Plant, Unit 2

Location: Bridgman, MI

Dates: May 1–5, 2017, and May 15–19, 2017

Inspectors: B. Jose, Senior Reactor Engineer (Lead)  
J. Bishop, Reactor Engineer  
J. Bozga, Senior Reactor Engineer  
M. Jones, Reactor Engineer  
J. Gilliam, Reactor Engineer  
M. Domke, Reactor Engineer

Approved by: Mark T. Jeffers, Chief  
Engineering Branch 2  
Division of Reactor Safety

Enclosure

## Table of Contents

SUMMARY .....	2
REPORT DETAILS .....	3
4.    OTHER ACTIVITIES .....	3
4OA5    Other Activities .....	3
4OA6    Management Meetings.....	24
SUPPLEMENTAL INFORMATION.....	1
Key Points of Contact .....	1
List of Items Opened, Closed and Discussed .....	1
List of Documents Reviewed .....	2
List of Acronyms Used.....	12

## **SUMMARY**

Inspection Report 05000316/2017009; 05/01/2017 – 05/19/2017; Donald C. Cook Nuclear Power Plant, Unit 2; Post-Approval Site Inspection for License Renewal.

The report covers a team inspection conducted by region-based engineering inspectors. The inspectors concluded commitments, license conditions, and regulatory requirements associated with the issuance of the renewed operating license are being met. The NRC's program for overseeing the Safe Operation of Commercial Nuclear Power Reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

### **NRC-Identified and Self-Revealed Findings**

No findings were identified.

### **Licensee-Identified Violations**

No violations were identified.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities

##### .1 Post-Approval Site Inspection for License Renewal (Phase II) – Inspection Procedure 71003

##### a. Inspection Scope

##### (1) Review of Newly Identified Structures, Systems, and Components

The inspectors discussed the identification of newly identified Structures, System, and Components (SSCs) under the purview of Title 10 of the *Code of Federal Regulations* (CFR), Part 54.37(b), with the licensee staff. The licensee added several components associated with the condensate system to various Aging management Programs (AMPs).

##### (2) Review of Updated Final Safety Analysis Report and Commitment Change Process

As part of reviewing the AMPs associated with the commitments, the inspectors reviewed the associated Updated Final Safety Analysis Report (UFSAR) sections to confirm the implemented programs were consistent with the UFSAR descriptions.

The inspectors reviewed the licensee's procedures to ensure commitment revisions followed guidance provided in the Nuclear Energy Institute Document 99-04, "Guidelines for Managing [U.S. Nuclear Regulatory Commission] NRC Commitment Changes." The review included verifying the licensee appropriately eliminated commitments and properly evaluated, approved, and reported changes to license renewal commitments listed in the UFSAR, in accordance with 10 CFR 50.59. The inspectors reviewed each Commitment change and no disparities were identified with respect to implementation of the commitment change process. The inspectors concluded the licensee's commitment change actions were acceptable.

##### (3) Review of Commitment Items

The inspectors reviewed supporting documents including completed surveillance records, conducted interviews, and performed walkdowns to verify the licensee completed the necessary actions to comply with the license conditions that are a part of renewed operating license. The inspectors verified the licensee implemented the AMPs and time-limited aging analyses included in NUREG-1831, "Safety Evaluation Report (SER) Related to the License Renewal of the D. C. Cook Nuclear Power Plant, Unit 1 and Unit 2," ML052230442, in accordance with 10 CFR Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants."

When changes to the commitments were identified, the inspectors reviewed the commitment change evaluation to verify the licensee followed the guidance in Nuclear Energy Institute Document 99-04 for license renewal commitment change process, including the elimination of commitments, and properly evaluated, reported, and approved where necessary, changes to license renewal commitments listed in the UFSAR, in accordance with 10 CFR 50.59.

The inspectors reviewed the commitments listed below, which are referenced in Appendix A of the SER. All 42 Commitment Items were selected for review. The inspectors concluded the licensee completed actions to allow closure of all 42 commitments.

Specific documents reviewed are listed in the Attachment to this report.

1. Alloy 600 Aging Management Program, Commitment Items 1, 2 and 3:

The Alloy 600 AMP is a new, plant-specific program that will manage aging effects of Alloy 600/690 components and Alloy 52/152 and 82/182 welds in the reactor coolant system (RCS) that are not addressed by other AMPs. This program will detect primary water stress corrosion cracking prior to loss of component intended function by using the examination and inspection requirements specified in American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI.

Commitment Item 1 specified the Alloy 600 AMP will be implemented prior to the period of extended operation. This program will manage aging effects of Alloy 600/690 components and Alloy 52/152 and 82/182 welds in the RCS that are not addressed by other AMPs. This program will detect primary water stress corrosion cracking prior to the loss of component intended function by using the examination and inspection requirements specified in ASME B&PV Code, Section XI.

Commitment Item 2 specified the Alloy 600 AMP commitment will also be revised to indicate that an inspection plan will be submitted for staff review and approval 3 years prior to the period of extended operation to determine if the program demonstrates an ability to manage the effects of aging per 10 CFR 54.21(a)(3).

Commitment Item 3 specified the licensee will continue to participate in industry initiatives, such as the Westinghouse Owners Group and the Electric Power Research Institute (EPRI) Materials Reliability Program (MRP). Susceptibility rankings and program inspection requirements regarding Alloy 82/182 pipe butt welds will be consistent with the later version of the EPRI MRP safety-assessment or its successors.

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 1, 2, and 3.

2. Boric Acid Corrosion Prevention Program, Commitment Item 4:

The Boric Acid Corrosion Prevention Program is an existing program, which relies on implementation of recommendations in NRC Generic Letter (GL) 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in [Pressurized Water Reactor] PWR Plants," (Reference B.3-6) to monitor the condition of ferritic steel components on which borated reactor water may leak. Periodic visual inspection of adjacent structures, components, and supports for evidence of leakage and corrosion is an element of the GL 88-05 Monitoring Program.



Commitment Item 4 specified the Boric Acid Corrosion Prevention Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.M10. The program will be enhanced to include the attributes documented in License Renewal Application (LRA), Section B.1.4, page B-26. The following enhancements to the Boric Acid Corrosion Prevention Program will be implemented prior to the period of extended operation:

- The program scope will be revised to address electrical components in addition to ferrite steel; and
- The program acceptance criteria will be revised to address electrical components in addition to ferrite steel.

The inspectors reviewed program basis documents, implementing procedures, work orders, and interviewed the program owner. Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 4.

### 3. Buried Piping Inspection Program, Commitment Items 5 and 42:

The Buried Piping Inspection Program is a new program, which will manage the effects of corrosion on the pressure-retaining capability of buried carbon steel piping and tanks.

Commitment Item 5 specified the Buried Piping Inspection Program will be implemented prior to the period of extended operation. The program will include preventive measures to mitigate corrosion, periodic inspections to manage the effects of corrosion on the pressure-retaining capability of buried carbon steel, copper alloy, copper, and iron piping and tanks. Preventive measures will be in accordance with standard industry practice for maintaining external coatings and wrappings. Buried piping and tanks, including buried piping and tanks constructed from carbon steel, copper alloy, copper, and iron that are not within the scope of license renewal, will be inspected when they are excavated during maintenance. Deficiencies associated with out-of-scope piping and tanks, will be evaluated for extent of condition, as applicable to in-scope buried piping and tanks.

Commitment Item 42, specified in response to the Advisory Committee on Reactor Safeguards, License Renewal Subcommittee comment regarding scheduling of buried piping inspections, the new Buried Piping Inspection Program will be enhanced to require performance of an inspection of buried piping included in the scope of this program. This inspection would occur within 10 years after entering the period of extended operation, unless an opportunistic inspection of similar underground piping has occurred within this 10-year period. Before the end of the 10 year of extended operation, the licensee will perform an engineering evaluation to determine whether sufficient inspections have been conducted to draw a conclusion regarding the ability of the underground coatings to protect the underground piping from degradation. If not, the licensee will conduct an inspection of a sample of buried piping to allow that conclusion to be reached.

The inspectors reviewed program basis documents, implementing procedures, and work orders. In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with Inspection Procedure (IP) 71002 to determine the adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 5 and 42.

4. Cast Austenitic Stainless Steel Evaluation Program, Commitment Item 6:

The Cast Austenitic Stainless Steel (CASS) Evaluation Program is a new program, which will augment the inspection of RCS components in accordance with ASME Section XI. The CASS Evaluation Program will manage the effects of loss of fracture toughness in RCS CASS components susceptible to thermal aging embrittlement using volumetric inspections or a component-specific flaw tolerance evaluation. This program will not include CASS components within reactor vessel internals as these are evaluated and inspected in the Reactor Vessel Internals CASS Program.

Commitment Item 6 specified the CASS Evaluation Program will be implemented prior to the period of extended operation. The program will include a determination of the susceptibility of the CASS components to thermal aging embrittlement based on casting method, molybdenum content, and percent ferrite. In DIT-B-03509-00, "Provide the potentially susceptible RCS primary loop (hot leg, cold leg, cross-over leg) material heats to thermal aging embrittlement," provides the results of a determination of the susceptibility of the reactor coolant CASS piping material heats to thermal aging embrittlement based on casting method, molybdenum content and percent ferrite. In EHI-5070-CASS, "Cast Austenitic Stainless Steel Program," describes how the program is implemented.

Prior to the period of extended operation, the licensee will develop AMP details (for example, plans for additional volumetric inspections or flaw tolerance evaluations) for the RCS piping heats of material that are susceptible to reduction of fracture toughness. The licensee contracted Westinghouse to perform the required flaw tolerance evaluation for the CASS reactor coolant loop piping. This evaluation, WCAP-17538-P, is complete and provides the results of a determination of susceptibility of reactor coolant CASS pipe material heats to thermal aging embrittlement based on casting method, molybdenum content, and percent ferrite. The CASS Evaluation Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.M12, as documented in LRA, Section B.1.7, page B-33.

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 6.

5. Fire Protection Program, Commitment Item 7:

The Fire Protection Program is an existing program and is consistent with, and includes exceptions to, the program as described in NUREG-1801, July 2001, Section XI.M26.

Commitment Item 7 specified the Fire Protection Program will be enhanced to include the attributes documented in LRA, Section B.1.11.1, pages B-45 and B-46. The following enhancements to the Fire Protection Program will be implemented prior to the period of extended operation:

- In the carbon dioxide (CO<sub>2</sub>) and halon procedures, ensure that conditions that may affect the performance of the system (such as corrosion, mechanical damage, or damage to dampers) are observed and degraded conditions are addressed via the Corrective Action Program; and
- Enhance procedures to ensure the diesel fuel supply line is monitored for degradation during performance testing.

The inspectors reviewed program basis documents, implementing procedures, and work orders. In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine the adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 7.

#### 6. Fire Water System Program, Commitment Item 8:

The Fire Water System Program is an existing program, consistent with, and includes exceptions to, the program as described in NUREG-1801, July 2001, Section XI.M27.

Commitment Item 8 specified that the program will be enhanced to include the attributes documented in LRA, Section B.1.11.2, Page B-49. The following enhancements will be implemented prior to the period of extended operation:

- A sample of sprinkler heads were inspected using the guidance of National Fire Protection Association 25, Section 2.3.3.1; and
- The Fire Water System Program was enhanced to perform nonintrusive measurement of pipe wall thickness per the NRC Interim Staff Guidance (ISG) (ISG-04 [ML023440137]).

The inspectors reviewed program basis documents, implementing procedures, and work orders. In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP. In accordance with IP 71002 to determine that the adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 8.

#### 7. Heat Exchanger Monitoring Program, Commitment Item 9:

The Heat Exchanger Monitoring Program is a new plant-specific program, which includes measures to verify heat exchanger degradation is not occurring in heat exchangers susceptible to loss of material and cracking.

Commitment Item 9 specified the licensee would implement the Heat Exchanger Monitoring Program prior to the period of extended operation. Furthermore, the licensee committed to inspect heat exchangers for degradation using non-destructive examinations (NDE), such as eddy current inspections or visual inspections or, if appropriate, the heat exchanger will be replaced. If degradation is found, an evaluation will be performed to determine its effects on the heat exchanger design functions.

The Heat Exchanger Monitoring Program Procedure states eddy current inspection of heat exchanger tubes will be performed every 10 years or more frequently, if inspection results indicate a need for more frequent inspections per the Program Basis Document, LR-HXMP-001.

The inspectors reviewed program basis documents, implementing procedures, scheduled and completed work orders, and commitment change documents.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine that the adequacy of the program in detecting and monitoring aging effects. Specifically, the inspectors reviewed visual and eddy current inspection results, action requests generated, heat exchanger program procedures, and tube plugging basis calculations.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined that the licensee met Commitment Item 9.

#### 8. Inservice Inspection Augmented Inspection Program, Commitment Item 10:

The ASME Section XI, Augmented Inspections Program will manage the effects of aging on selected components outside the jurisdiction of ASME Section XI. To the extent practical, augmented inspections will be consistent with the applicable ASME requirements of ASME Section XI (i.e., selection of inspection methods, inspection frequency, percentage of components examined within a population, and acceptance criteria). This program requires enhancements that will be implemented prior to the period of extended operation.

Commitment Item 10 specified the following enhancements to the Inservice Inspection (ISI) –ASME Section XI, Augmented Inspection Program will be implemented prior to the period of extended operation:

- An augmented ISI volumetric inspection of the spray additive tanks and the portions of the containment spray system that are wetted by sodium hydroxide; and
- An augmented ISI volumetric inspection of the portions of the discharge header in containment that may contain water with concentrated contaminants.

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 10.

#### 9. Instrument Air Quality Program, Commitment Item 11:

The Instrument Air Quality Program is an existing program, which periodically documents the control air system quality for maximum dew point, particulate size, and dryer condition. The program ensures the control air supplied to components within the scope of license renewal is maintained free of water and significant contaminants.

Commitment Item 11 specified the licensee would enhance the Instrument Air Quality Program procedure prior to the period of extended operation to clearly specify frequencies for the dew point and dryer tours.

The inspectors interviewed the program owner and reviewed the implementing procedures, completed work orders, scheduled recurring tasks for the program, and available trending data for applicable components.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects. Specifically, the inspectors reviewed the license renewal application, the Donald C. Cook SER, implementing documents and the licensee's evaluation of AMP document for the Instrument Air Quality Program.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 11.

10. Non-Environmental Qualification Inaccessible Medium-Voltage Cable Program Extended Period, Commitment Item 12:

The Non-Environmental Qualification (EQ) Inaccessible Medium-Voltage Cable Program is a new program that will be implemented prior to the operation.

Commitment Item 12 specified the Non-EQ Inaccessible Medium-Voltage Cable Program applies to inaccessible (e.g., in conduit or direct-buried) medium-voltage cables within the scope of license renewal that are exposed to significant moisture simultaneously with applied voltage. This program will test these cables to provide an indication of the condition of the conductor insulation. The specific type of test performed will be determined prior to the initial test. The Non-EQ Inaccessible Medium Voltage Cable Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.E3, as documented in LRA, Section B.1.20, page B-71.

The inspectors reviewed program basis documents, implementing procedures, work orders, and interviewed the program owner. Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 12.

11. Non-Environmental Qualification Instrumentation Circuits Test Review Program, Commitment Items 13 and 38:

The Non-EQ Instrumentation Circuits Test Review Program is a new program that will be implemented prior to the period of extended operation. The licensee's program will be comparable to the program described in NUREG-1801, Section XI.E2, Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits. Commitment Item 13 specified the Non-EQ Instrumentation Circuits Test Review Program will be implemented prior to the period of extended operation. The electrical cables included in the scope of this program meet all of the following criteria:

- Not subject to the EQ requirements of 10 CFR 50.49;
- Used in instrumentation circuits with sensitive, high voltage, low-level signals; and
- Exposed to adverse localized environments caused by heat, radiation, or moisture.

This program will be consistent with the program described in NUREG-1801, Section XI.E2, with the exception noted in the LRA, Section B.1.21, pages B-72 and B-73.

Commitment Item 38 specified an insulation resistance test method, such as time-domain reflectometry, will be continued through the period of extended operation, as part of the Non-EQ Instrumentation Circuits Test Review Program. The test frequency of instrumentation cables that are in the scope of this program, but are disconnected during calibration, shall be determined by the licensee based on engineering evaluation, but will not be less than once every ten years.

The inspectors reviewed program basis documents, implementing procedures, work orders, and interviewed the program owner. Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 13 and 38.

12. Non-Environmental Qualification Insulated Cables and Connections Program, Commitment Item 14:

The Non-EQ Insulated Cables and Connections Program is a new program, which will be implemented prior to the period of extended operation. The licensee's program will be comparable to the program described in NUREG-1801, Section XI.EI, Electrical Cables and Connections Not Subject to 10 CFR 50.49 EQ Requirements.

Commitment Item 14 specified the Non-EQ Insulated Cables and Connections Program will be implemented prior to the period of extended operation. The Non-EQ Insulated Cables and Connections Program will apply to accessible insulated cables and connections installed in structures within the scope of license renewal and prone to adverse localized environments. The Non-EQ Insulated Cables and Connections Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.E1, as documented in LRA, Section B.1.22, page B-74.

The inspectors reviewed program basis documents, implementing procedures, work orders, and interviewed the program owner. Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 14.

13. Pressurizer Examinations Program, Commitment Item 15:

The Pressurizer Examinations Program is an existing plant-specific program. There is no comparable NUREG-1801 Program. As discussed in WCAP-14574-A, "License Renewal Evaluation: Aging Management for Pressurizers," (Reference B.3-18), cracking of the pressurizer cladding (and items attached to the cladding) may propagate into the underlying ferritic steel. In addition, the pressurizer spray head is susceptible to cracking and reduction of fracture toughness. The purpose of the pressurizer examinations is to identify degradation that could potentially cause loss of intended function of these pressurizer components.

Commitment Item 15 specified the following enhancements to the Pressurizer Examinations Program, which will be implemented prior to the period of extended operation:

- The condition of the internal spray head, spray head-locking bar, and coupling will be determined by a one-time visual examination of these components in one unit. This examination will be performed to accepted ASME Section XI methods and standards to ensure that degradation of these items has not occurred; and
- If flaws are detected in the spray head, spray head locking bar, or coupling, engineering analysis will be completed to determine corrective actions, which could include replacement of the spray head. The need for subsequent inspections will be determined after the results of the initial inspection is evaluated.

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 15.

14. Preventative Maintenance Program, Commitment Items 16 and 37:

Commitment Item 16 specified the existing Preventative Maintenance (PM) Program will be enhanced to include attributes documented in LRA Section 8.1.25, Pages B-86 and B-87, and as amended in the supplemental response to Request for Additional Information 2.3.3.8-6. The PM activities provide for periodic equipment inspections and testing to detect the various aging effects applicable to those components included in the scope of the PM Program for license renewal.

Commitment Item 16 specified that the following enhancements to the PM Program would be implemented prior to the period of extended operation: Revise PM tasks for the emergency diesel generator ventilation system to include inspection of the flex joints, for the control room ventilation air handler packages to include inspection of the heat exchanger tubes and flex joints, and for the auxiliary feedwater pump room cooling units to include inspection of the internal evaporator tubes, valves, and tubing.

The PM program will manage the aging effects for the emergency diesel engine elastomer flex hoses or tubing, reactor coolant pump lube oil leakage collection components, rubber hoses in the compressed air system, rubber hoses in the Post-Accident Containment Hydrogen Monitoring System reagent gas supply, and elastomer condensate storage tanks floating head seals.

Commitment Item 16 specified that the PM program will manage loss of material for the Emergency Diesel Generator (EDG) Exhaust internals. Visual inspections of the EDG exhaust silencer internals will be performed before the period of extended operation as part of the PM Program. The frequency of future inspections will be based on the initial inspection results.

The inspectors reviewed implementing procedures, samples of completed work orders, and scheduled recurring tasks for the program. In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects.

The licensee submitted a commitment revision to the NRC on March 1, 2013, (ML13073A110), related to Commitment Item 16. This Commitment 16 revision was reviewed and it was determined that the revision did not have any impact on the finding of acceptability in NUREG-1831 of Indiana Michigan Power Company's AMP for extended operation of the Cook Nuclear Plant units. The NRC staff acknowledged the changed commitments but took no action to revise NUREG-1831 or the Renewed Facility Operating Licenses.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 16 and 37.

15. Reactor Vessel Integrity Program, Commitment Item 17:

The Reactor Vessel Integrity Program is an existing program. The purpose of the Reactor Vessel Integrity Program is the manage reduction of fracture toughness of reactor vessel beltline materials to ensure the pressure boundary function of the reactor vessel beltline is maintained for the period of extended operation. The program is based on ASTM E-185-82, "Standard Recommended Practice for Surveillance Tests for Nuclear Reactor Vessels," and includes an evaluation of radiation damage based on pre-irradiation and post-irradiation testing of Charpy V-notch and tensile specimens. Eight specimen capsules were inserted into each reactor vessel prior to initial startup. The capsules contain reactor vessel steel specimens from the limiting shell plate surrounding the core region of the reactor and associated weld metal and heat-affected zone metal. The capsules also contain dosimeters and thermal monitors.

Commitment Item 17 specified the Reactor Vessel Integrity Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.M31. The program will be enhanced to include the attributes documented in LRA, section B.1.26, page B-89. The following enhancements to the Reactor Vessel Integrity Program will be implemented prior to the period of extended operation:

- The licensee will pull and test one additional standby capsule for each unit between 32 effective full-power years (EFPY) and 48 EFPY to cover the peak fluence expected at 60 years. A fluence update will be performed at approximately 32 EFPY when Capsules W (Unit 1) and S (Unit 2) are pulled and tested. A subsequent fluence update will be performed when the standby capsules are pulled and tested between 32 EFPY and 48 EFPY.
- Modifications to design and operation that result in changes to the neutron energy spectrum or operating temperatures will be compared to the original environment in which the capsules were irradiated.

The inspectors interviewed the program owner, reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 17.



16. Reactor Vessel Internals Plates, Forgings, Welds, and Bolting Program, Commitment Items 18, 19, and 36:

The Reactor Vessel Internals Plates, Forgings, Welds, and Bolting Program is a new program, which manages aging effects of reactor vessel internals plates, forgings, welds, and bolting. This program supplements the reactor vessel internals inspections required by the ASME Section XI ISI Programs.

Commitment Item 18 specified the Reactor Vessel Internals Plates, Forgings, Weld, and Bolting Program commitment will be revised to indicate that the program to manage void swelling will be submitted for staff review and approval 3 years prior to the period of extended operation. Commitment Item 18 was superseded by Commitment Item 36.

Commitment Item 19 specified the Reactor Vessel Internals Plates, Forgings, Welds, and Bolting Program is a new program that will be implemented prior to the period of extended operation. This program will include visual inspections and non-destructive examinations of the reactor vessel internals during the period of extended operation. A visual inspection will be performed on plates, forgings, and welds to detect and monitor cracking caused by Irradiation Assisted Stress Corrosion Cracking enhanced by reduction of fracture toughness by irradiation embrittlement and distortion due to swelling. For baffle bolts, a volumetric inspection of critical locations will be performed to assess cracking. The licensee will participate in industry-wide programs designed by the PWR Materials Reliability Project Issues Task Group for investigating the impacts of aging on PWR vessel internal components.

Commitment Item 36 states the licensee will submit the Reactor Vessel Internals Plates, Forgings, Welds, and Bolting Program for NRC staff review and approval 3 years prior to the period of extended operation for Unit 2 and no later than October 1, 2012, for Unit 1. The Reactor Vessel Internals Plates, Forgings, Welds and Bolting Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.M16, as documented in LRA, Section B.1.27, page B-92.

The licensee submitted the Reactor Vessel Internals Plates, Forgings, Welds, and Bolting Program to NRC staff on October 1, 2012, (ML1284A320). On September 8, 2016, the NRC submitted a letter to the licensee (ML16063A434) stating that the staff completed their assessment of the program and concluded that it was acceptable because it was consistent with the inspection and evaluation guidelines of MRP-227-A, "Material Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines."

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 19 and 36.

17. Reactor Vessel Internals Cast Austenitic Stainless Steel Program, Commitment Item 20:

The Reactor Vessel Internals (RVI) CASS Program is a new program to manage aging effects of CASS RVI components.

Commitment Item 20 specified the RVIs CASS Program will be implemented prior to the period of extended operation. This program will provide visual inspections and NDE of the RVIs during the period of extended operation. The program will monitor propagation of cracks from existing flaws. In addition to the features of the program described in NUREG-1801, Section XI.M13, the program will manage the aging effects of distortion due to void swelling of the RVIs. Applicable components will be determined based on the neutron fluence and thermal embrittlement susceptibility of the component. The commitment further specified that the licensee will participate in industry-wide programs designed by the PWR Materials Reliability Project Issues Task Group for investigating the impacts of aging on PWR vessel internal components.

In the letter AEP-NRC-2012-82 (ML12284A320) dated October 1, 2012, the licensee submitted the new RVIs AMP to the NRC. Letter AEP-NRC-2012-82 addresses visual and volumetric inspections of the CASS components during the period of extended operation. In EHI-5054-RVI, "Reactor Vessel Internals Inspections," describes how the program is implemented.

The letter AEP-NRC-2012-82 also identifies licensee commitments to perform a plant specific evaluation of RVI CASS material. The licensee is participating in Pressurized Water Reactor Owners Group Project PA-MS-0983, "Support for Applicant Action Items 1, 2, and 7 from the Final Safety Evaluation on MRP-227, Revision 0," to address this issue. In EHI-5054-RVI describes how the aging effects of distortion due to void swelling are managed.

The inspectors interviewed the program owner and reviewed program basis documents, implementing procedures, and scheduled and completed work orders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 20.

#### 18. Service Water System Reliability Program, Commitment Items 21 and 41:

The Service Water System Reliability Program is an existing program. Commitment Item 21 specified the program will be consistent with, but include exceptions to, the program described in NUREG-1801, Section XI.M20, "Open-Cycle Cooling Water Systems," as documented in LRA, Section 8.1.29, Pages B-95 and B-96, with enhancements. This program relies on implementation of the recommendations of GL 89-13, "Service Water System Problems Affecting Safety Related Equipment," to ensure the effects of aging on the essential service water (ESW) system will be managed for the period of extended operation. The program includes surveillance and control techniques to manage aging effects caused by bio-fouling, corrosion, erosion, protective coating failures, and silting in the ESW system or structures and components serviced by the ESW system.

The program takes exception to the program described in NUREG-1801, Section XI.M20, in that:

- Program heat exchangers may receive a thorough visual inspection and cleaning in lieu of thermal performance testing;
- NUREG-1801 states that system components are constructed of appropriate materials and lined or coated to protect the underlying metal surfaces from being exposed to aggressive cooling water environments. Not all of the licensee's

- system components are lined or coated. They are lined or coated only where necessary to protect the underlying metal surfaces; and
- NUREG-1801 requires that testing and inspections be performed annually and during refueling outages. The licensee's program performs tests and inspections on a refueling outage frequency.

Commitment Item 21 specified the Service Water Reliability Program will be enhanced to check for selective leaching during visual inspections.

The licensee submitted a UFSAR update per the guidance of 10 CFR 50.71(e) to remove the commitment to develop a new PM activity or revise an existing PM activity to ensure the 8-inch expansion joints in the ESW supply lines to the EDG heat exchangers are inspected for evidence of loss of material, change in material properties, and cracking. The licensee determined that because the required PM activity is currently being implemented that ensures the 8-inch expansion joints are replaced on a 5R frequency, these components are not subject to the license renewal rules.

Commitment Item 41 specified the Service Water Reliability Program will be enhanced to manage the loss of material due to selective leaching of susceptible materials by visual inspections and hardness testing, or an equivalent method.

The inspectors reviewed the program basis document, implementing procedures, scheduled and completed work orders, commitment change documents, and applicable Action Requests (ARs). The inspectors reviewed vendor recommendations and operating experience related to expansion joint replacements.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects. Specifically, the inspectors reviewed visual inspection results, action requests generated, and program procedures; inspectors also interviewed the Service Water Reliability Program owner.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 21 and 41.

#### 19. Small Bore Piping Program, Commitment Item 22:

The Small Bore Piping Program is a new program for managing cracking of small bore Class 1 RCS piping, comparable to the program described in NUREG-1801, Section XI.M32, One-Time Inspection.

Commitment Item 22 specified the Small Bore Piping Program will be implemented prior to the period of extended operation. The small bore piping inspections will involve a one-time volumetric examination of susceptible items in selected locations of Class 1 small bore piping. These inspections will occur at or near the end of the initial operating period for Units 1 and 2.

The inspectors reviewed the licensing and program basis documents, implementing procedures, work orders, ARs and interviewed the plant personnel responsible for the program.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 22.

20. Structures Monitoring - Structures Monitoring Program, Commitment Item 23:

The Structural Monitoring Program is an existing program comparable to the program described in NUREG-1801, Section XI.S6 implemented to monitor the condition of structures and structural components within the scope of the Maintenance Rule. The program was expanded to encompass structures and structural components within the scope of license renewal.

Commitment Item 23 specified the Structures Monitoring Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.S6. The program will be enhanced to include the attributes documented in LRA, Section B.1.32, pages B-101 and B-102. The program will be enhanced to include the following in the Structures Monitoring Program:

- equipment supports;
- instrument panels;
- racks; cable trays;
- conduits;
- cable tray supports;
- conduit supports;
- elastomers;
- pipe hangers/supports;
- fire protection pump house superstructure and walls;
- gas bottle storage tank rack and foundation;
- security diesel generator room;
- switchyard control house;
- fire protection water storage tank foundation;
- primary water storage tank foundation; and
- the roadway west of the greenhouse.

The licensee also identified three newly-identified SSCs to include within the scope of the Structures Monitoring Program. These include:

- turbine sump emergency overflow sump;
- ramp curbs at the turbine room entrance to passageway between the diesel generator rooms; and
- the reinforced concrete grade beam wall and tops of the ramps on the west side of the Turbine Building.

The inspectors reviewed the licensing and program basis documents, implementing procedures, work orders, ARs, performed a walkdown, and interviewed the plant personnel responsible for the program.

The inspectors noted the last three items noted above (turbine emergency overflow sump, ramp curbs at turbine room entrance, and grade beam wall and top of the rams) were added to the scope after issuance of the NRC SER per NUREG-1831, based on a new flooding report performed by the licensee in 2007. The licensee communicated this change to the NRC through letter AEP-NRC-2010-61 (ML102930151), dated October 8, 2010.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 23.

#### 21. Structures Monitoring – Crane Inspection Program, Commitment Item 24:

The Crane Inspection Program is an existing program comparable to the program described in NUREG-1801, Section XI.M23, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems.

Commitment Item 24 specified the Structures Monitoring - Crane Inspection Program will be consistent, but with some exceptions to, the program described in NUREG-1801, July 2001, Section XI.M23, as documented in LRA, Section B.1.33, Page B-104. The program will be enhanced to include the attributes documented in LRA, Section B.1.33, page B-105. The following enhancements to the Crane Inspection Program will be implemented prior to the period of extended operation:

- Develop procedures or recurring tasks to: evaluate the effectiveness of the Maintenance Monitoring Program and the effects of past and future usage on the structural reliability of in-scope cranes, verify in-scope crane rails and structural components are visually inspected on a routine basis for loss of material, and verify significant visual indications of loss of material due to corrosion or wear are evaluated according to applicable industry standards and good industry practice.

The inspectors reviewed the licensing and program basis documents, implementing procedures, work orders, ARs and interviewed the plant personnel responsible for the program.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 24.

#### 22. Structures Monitoring – Masonry Wall Program, Commitment Item 25:

The Masonry Wall Program is an existing program comparable to the program described in NUREG-1801, Section XI.S5, Masonry Wall Program.

Commitment Item 25 specified the Structures Monitoring - Masonry Wall Program will be consistent with the program described in NUREG-1801, July 2001, Section XI.S5. The program will be enhanced to include the attributes documented in LRA, Section B.1.36, page B-112. The following enhancements to the Masonry Wall Program will be implemented prior to the period of extended operation:

- Include the 4-hour fire-rated masonry block in the turbine building and greenhouse; and Masonry block in the auxiliary building; and
- Enhance the Plant Structures Performance Evaluation and Monitoring Program procedure to specify the masonry walls in the auxiliary building that perform a license renewal intended function and fire-rated masonry walls in the turbine building and greenhouse are within the scope of this procedure.

The inspectors reviewed the licensing and program basis documents, implementing procedures, work orders, ARs and interviewed the plant personnel responsible for the program.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 25.

### 23. System Testing Program, Commitment Item 26:

The System Testing Program is an existing program, which encompasses a number of miscellaneous system and component testing activities credited for managing the effects of aging. These activities are typically surveillance activities required by the Technical Specifications or normal monitoring of plant operation (for example, plant log readings or other normal monitoring techniques).

Commitment Item 26 specified the following enhancements would be implemented prior to the period of extended operation:

- Develop periodic surveillance for the centrifugal charging pumps minimum flow orifices to detect internal erosion; and
- Ensure procedures for engineered safety features ventilation unit, the fuel handling area exhaust unit, and control room ventilation unit surveillance testing include visual verification that the drain valves and drain piping have not experienced loss of material to the extent that their pressure boundary function is compromised. The procedures will include inspection of the external surfaces of ventilation drain valves and drain piping for any through-wall degradation (e.g., pinholes, etc.) or any general corrosion.

The inspectors interviewed the program owner and reviewed implementing procedures, completed work orders, scheduled recurring tasks for the program, and available trending data for applicable components.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects. Specifically, the inspectors reviewed the LRA, the Donald C. Cook SER, implementing documents, and the licensee's evaluation of the AMP document for the System Testing Program.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 26.

#### 24. System Walkdown Program, Commitment Item 27:

The System Walkdown Program is an existing program, which manages loss of material, loss of mechanical closure integrity and cracking, as applicable, for systems and components within the scope of license renewal. The program uses general visual inspections of readily accessible system and component surfaces during system walkdowns.

Commitment Item 27 specified the System Walkdown Program would be enhanced prior to the period of extended operation to:

- Ensure balance of plant systems are adequately addressed with regard to license renewal considerations;
- Enhance the program description to emphasize management expectations that the entire system, where accessible, is walked down once a refueling cycle;
- Enhance the program description to emphasize the accessibility of aspects of the system during refueling and maintenance outages;
- Ensure evidence of corrosion is monitored adequately;
- Enhance the program description to emphasize the need to walkdown existing aging concerns, and to provide feedback to management regarding their condition (i.e., in system health reports or corrective action program). If the condition declines significantly, initiate a condition report for further evaluation;
- Enhance acceptance criteria to ensure adequate detection of aging effects, including:
  - The impact of nonsafety-related SSCs on safety-related components with emphasis that preventive measures will be taken prior to loss of an SSC's license renewal intended function;
  - Extrapolation of conditions found in accessible structures or components to inaccessible structures or components;
  - Ensuring changes in material/environment combinations are addressed. Examples include: soil or water covering a pipe that was previously uncovered and excessive moisture in the area where previously not present; and
- Develop and implement enhanced administrative controls.

The inspectors interviewed the program owner and reviewed implementing procedures, completed work orders, scheduled recurring tasks for the program, and a sample of completed system walkdown reports. The inspectors also accompanied the licensee staff on a partial walkdown of the auxiliary feedwater and non-essential service water systems. Additionally, the inspectors reviewed generated ARs to review the disposition of items identified during walkdowns.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 27.

25. Wall Thinning Monitoring Program, Commitment Item 28:

The Wall Thinning Monitoring Program is a new program that will include inspections of carbon steel piping and valves in the containment isolation system and the auxiliary feedwater system to ensure piping wall thickness is above the minimum required.

Commitment Item 28 specified the Wall Thinning Monitoring Program will be implemented before the period of extended operation. The wall thinning inspections will be performed to ensure piping wall thickness is above the minimum required to avoid failures under normal conditions and postulated transient and accident conditions, including seismic events.

The inspectors reviewed program basis documents, implementing procedures, and work orders. In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine the adequacy of the program in detecting and monitoring aging effects.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 28.

26. Water Chemistry Control – Primary and Secondary Water Chemistry Control Program, Commitment Item 29:

The Water Chemistry Control – Primary and Secondary Water Chemistry Control Program is an existing program. The program mitigates damage caused by corrosion and stress corrosion cracking. This Water Chemistry Program relies on monitoring and control of water chemistry based on EPRI Guidelines.

Commitment Item 29 specified the licensee would enhance the program by the period of extended operation by implementing the following changes:

- Revise the program controlling procedures to require individual implementing procedures to identify and prescribe any special collection and preservation needs of a sample;
- Bring the parameters monitored/inspected and acceptance criteria into clear alignment with the EPRI water chemistry guidelines and
- Include sulfate monitoring criteria for the refueling water storage tank that are consistent with the EPRI Guidelines and the sulfate criteria for other systems impacted by refueling water storage tank chemistry.

The inspectors interviewed the program owner, reviewed individual implementing procedures, program-implementing procedures, program basis documents, and EPRI Topical Reports for primary and secondary water chemistry control.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 29.



27. Water Chemistry Control – Chemistry One-Time Inspection Program, Commitment Item 30 and 39:

The Water Chemistry Control – Chemistry One-Time Inspection Program is a new program that the licensee committed to implement and complete prior to the period of extended operation. The program will verify the effectiveness of the Water Chemistry Control Program to ensure aging effects are effectively managed during the period of extended operation.

Commitment Item 30 specified the Chemistry One-Time Inspection Program would be implemented and completed prior to the period of extended operation. Combinations of NDE, including visual, ultrasonic, and surface techniques, a representative sample of components that credit the Water Chemistry Control Program will be inspected.

Commitment Item 39 specified the following:

- The licensee will include auxiliary steam system copper heater coils, cast iron strainer housings, and carbon steel traps exposed to an internal steam environment in the Chemistry One-Time Inspection Program, which is described in LRA Section B.1.41;
- The licensee will include these 10 CFR 54.4(a)(2) components (i.e., components in systems that are subject to aging management review, and may be pressurized and contain raw or untreated water) in the Chemistry One-Time Inspection Program; and
- This one-time inspection will be performed near the end of the current operating term. The visual inspections will identify indications of loss of material. If loss of material is identified, an evaluation will be performed to confirm that the rate is sufficiently slow and that loss of intended function will not occur during the period of extended operation. For material and environment combinations with no evidence of loss of material or with very gradual loss of material, no further actions will be taken. For material and environment combinations with loss of material rates such that loss of intended function could occur during the period of extended operation, corrective actions will be taken in accordance with the CAP. Appropriate corrective actions may consist of component replacement or additional inspections for components with the material and environment combination in which the excessive loss of material is found.

The inspectors reviewed program basis document, implementing procedures, scheduled and completed work orders, and applicable ARs. Additionally, the inspectors interviewed the Chemistry One-Time Inspection Program owner.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Items 30 and 39.

28. Fatigue Monitoring Program, Commitment Items 31, 33, 35 and 40:

Fatigue Monitoring Program is an existing program comparable to the program described in NUREG-1801, Section X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary.

The Fatigue Monitoring Program monitors and tracks the number of critical thermal and pressure transients for selected RCS components in order not to exceed the design limit on fatigue usage. The program maintains the basis for component analyses containing explicit thermal cycle count assumptions. Components managed by this program are those shown to be acceptable by analyses that explicitly addressed thermal and pressure fatigue transient limits.

Commitment Item 31 specified the licensee would enhance the Fatigue Monitoring Program by performing one or more of the following prior to the period of extended operation for the pressurizer surge line:

- Further refine the fatigue analysis to lower the pressurizer surge line cumulative usage factors to below 1.0;
- Repair the affected locations;
- Replace the affected locations;
- Manage the effects of fatigue of the pressurizer surge line by an NRC-approved inspection program; and/or
- Review changes to ASME B&PV Code actions relating to environmental fatigue. Any refined analysis will use the methodology approved by the ASME Committee and the NRC.

Commitment Item 33 specified the licensee would enhance the Fatigue Monitoring Program by performing one or more of the following prior to the period of extended operation for the Class 1 charging and safety injection nozzles:

- Perform a plant-specific fatigue analysis of the Class 1 charging and safety injection nozzles, which includes environmental effects, to ensure that cumulative usage factors are below 1.0;
- Manage the effects of fatigue of the Class 1 charging and safety injection nozzles by an NRC-approved inspection program (e.g., periodic NDE of the affected locations at inspection intervals to be determined by a method accepted by the NRC). The inspections are expected to be able to detect cracking due to thermal fatigue prior to loss of function. Replacement or repair will then be implemented such that the intended function will be maintained for the period of extended operation;
- Repair portions of the Class 1 charging and safety injection nozzles at the affected locations, as necessary to ensure the intended function will be maintained for the period of extended operation;
- Replace portions of the Class 1 charging and safety injection nozzles at the affected locations, as necessary to ensure the intended function will be maintained for the period of extended operation; and/or
- Monitor ASME Code activities to use the environmental fatigue methodology approved by the ASME Code Committee and the NRC.

Commitment Item 35 specified the licensee would enhance the Fatigue Monitoring Program by performing one or more of the following prior to the period of extended operation for the residual heat removal (RHR) piping:

- A plant-specific fatigue analysis of Class 1 portions of RHR piping, which includes environmental effects, will be performed to ensure that cumulative usage factors remain below 1.0;

- Repair the Class 1 portions of RHR piping at the affected locations;
- Replace the Class 1 portions of RHR piping at the affected locations;
- Manage the effects of fatigue of the Class 1 portions of RHR piping by an NRC-approved inspection program (e.g., periodic NDE of the affected locations at inspection intervals to be determined by a method accepted by the NRC). The inspections are expected to be able to detect cracking due to thermal fatigue prior to loss of function. Replacement or repair will then be implemented such that the intended function will be maintained for the period of extended operation; and/or
- Monitor ASME Code activities to use the environmental fatigue methodology approved by the ASME Code committee and NRC.

Commitment Item 40 specified the frequency noted on page 6-3 of WCAP-14070 for valve leakage is assumed to occur for each of the reactor years of operation for the plant. The cycles are assumed to be for 40 years of operation. Therefore, this frequency is time-dependent and constitutes a time-limited aging analysis. The licensee will perform one or more of the following activities to address fatigue of the auxiliary spray line piping evaluated in WCAP-14070:

- Perform a plant-specific fatigue reanalysis of the auxiliary spray line piping prior to entering the period of extended operation to ensure that cumulative usage factors are below 1.0;
- Repair piping at the affected locations; and/or
- Replace piping at the affected locations.

Manage the effects of fatigue of the auxiliary spray line piping by an NRC-approved inspection program (e.g., periodic NDE of the affected locations at inspection intervals to be determined by a method accepted by the NRC). It is expected that the inspections will be able to detect cracking due to thermal fatigue prior to loss of function. Replacement or repair, if necessary, will then be implemented such that the intended function will be maintained for the period of extended operation.”

For Commitment Items 31, 33, 35 and 40, the licensee elected to perform plant-specific fatigue analyses. These analyses demonstrated that the cumulative usage factor for all components will remain below 1.0 during the period of extended operation. The inspectors also reviewed the licensing and program basis documents, work orders, ARs and interviewed the plant personnel responsible for the program.

Based on the timeliness and adequacy of the licensee’s actions, the inspectors determined the licensee met Commitment Item 31, 33, 35 and 40.

29. Evaluate Fuse Holders, Commitment Item 32:

Commitment Item 32 referenced Interim Staff Guidance Document ISG-5, which addresses fuse holders not part of a larger assembly, but support safety-related and nonsafety-related functions in which a failure of a fuse precludes a safety function from being accomplished. Fuse holders that meet these requirements will be evaluated before the beginning of the period of extended operation for possible aging effects. These fuses will either be replaced, modified to remove the aging effects, or a program will be implemented to manage the aging effects. The AMP (if needed) for fuse holders will consider the aging stressors for the metallic clips

The inspectors reviewed the evaluation related to Commitment Item 32 which concluded that all fuse holders are included in an active component or do not perform a license renewal intended function. Since all fuse holders screened out, Unit 2 does not require an AMP for fuse holders.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 32.

30. Fatigue Monitoring Program, Commitment Item 34:

Fatigue Monitoring Program is an existing program comparable to the program described in NUREG-1801, Section X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary.

The Fatigue Monitoring Program monitors and tracks the number of critical thermal and pressure transients for selected RCS components in order not to exceed the design limit on fatigue usage. The program maintains the basis for component analyses containing explicit thermal cycle count assumptions. Components managed by this program are those shown to be acceptable by analyses that explicitly addressed thermal and pressure fatigue transient limits.

Commitment Item 34 specified the licensee will review the piping loads on the remaining hot penetrations to establish the base loads for the fatigue exemption provisions of ASME Section III, N-415.1. The licensee will group the penetrations based on their duty cycle during normal operations including inservice testing duty. The cycle loads and stresses will be added to the piping analysis loads as appropriate and the resultant loads will be compared to the fatigue exemption provisions of ASME Section III, N-415.1. Any penetration group that does not meet the exemption provisions will be analyzed for fatigue using the most limiting penetration to represent the group. This evaluation will be completed prior to entering the period of extended operation, and will be projected to the end of the period of extended operation.

The inspectors interviewed the program owner, reviewed implementing procedures, containment penetration fatigue analyses, and trending data for applicable components.

In addition to the commitment implementation review, the inspectors reviewed attributes of the AMP in accordance with IP 71002 to determine adequacy of the program in detecting and monitoring aging effects. Specifically, the inspectors reviewed the license renewal application, the Donald C. Cook SER, implementing documents and the licensee's evaluation of AMP document for the Fatigue Monitoring Program.

Based on the timeliness and adequacy of the licensee's actions, the inspectors determined the licensee met Commitment Item 34.

4OA6 Management Meetings

.1 Exit Meeting Summary

On May 19, 2017, the inspectors presented the inspection results to Mr. Joel Gebbie and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

J. Gebbie, Chief Nuclear Officer  
S. Lies, Site Vice President  
M. Lloyd, Engineering Vice President  
M. Scarpello, Manager, Regulatory Assurance  
B. Kalinowski, Aging Management Coordinator  
K. Anderson, ENU Acting Manager  
R. Wynegar, Regulatory Affairs

#### U.S. Nuclear Regulatory Commission

J. Ellegood, Senior Resident Inspector  
T. Taylor, Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

#### Opened, Closed, and Discussed

None

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 4OA5 Other Activities

#### **Condition Reports Generated as a Result of this Inspection**

<u>Number</u>	<u>Description or Title</u>	<u>Date</u>
AR 2017-4521	U2 CD Diesel Fuel Return Line Mounting Brackets not Attached	05/04/17
AR 2017-4481	Sprinkler Pipe Vibrating	05/02/17
AR 2017-4496	NRC Identified – White Residue Ice Machine Bin	05/02/17
AR 2017-4497	NRC Identified – White-ish Buildup on Glycol Piping	05/02/17
AR 2017-4499	Oil Leak Below the Inboard Bearing of 2-PP-10E	05/02/17

#### **Action Requests Reviewed During the Inspection**

<u>Number</u>	<u>Description or Title</u>	<u>Date</u>
CR-2012-5755	Aging Management of Buried EDG Copper Tubing Not in LRA	05/01/12
CR 2014-6020	NRC position on Small Bore Piping	05/16/14
AR 2016-12844	Packing Leak 2-ICM-111	11/05/16
AR 2017-4055	Boric Acid Leak 2-ICM-111	04/20/17

#### **Commitment Nos. 1, 2 and 3**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
EHI-5070-ALLOY600	Alloy 600 Material Management Program	7
PMP-5070-ISI-002	Inservice Inspection Program Implementation	14
WCAP-16198-P	PWSCC Susceptibility Assessment of the Alloy 600 and Alloy 82/182 Components in D.C. Cook Units 1 and 2	1
DCC01.G03	Donald C. Cook Nuclear Plant Units 1 and 2 ISI Program Plan Fourth Ten Year Interval	8
12-EHP-5037-SGP-007	Steam Generator Management Program –Steam Generator Inspection Requirements	10
ISI Program Plan	ISI Program Plan, 4th Ten-Year Inspection Interval, Alloy 600 Related Inspections	8
WO 55462921	Perform Direct Visual Examination of the Lower Vessel BMI Penetrations IAW 12-QHP-5050-027	10/04/16
WO 55377959	Inspect U2 RV Supports and Nozzles	01/10/12
WO 55464565	NQQS: Inner & Outer Head Seal Leak Off Line Leak Inspection	10/04/16
WO 55470710	EISI Vendor Examinations on ISI ISO#A-4/AEP DWG, 2-5436 (Section M-7) 2-OME-4 Pressurizer Nozzles Weld Overlays	07/29/16
WO 55443878	ESGP, 2-OME-3-1, Perform SG Primary Side Activities	09/28/16

**Commitment Nos. 1, 2 and 3**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
WO 55310580	ENPW, 2-OME-3-1, Perform Bowl Scan via Pan, Tilt, Zoom Cam	06/08/11
AEP-NRC-2011-39	Donald C. Cook Nuclear Plant Units 1 and 2 License Renewal Submittal –Alloy 600 Aging Management Program	08/17/11
AEP-NRC-2012-4	Donald C. Cook Nuclear Plant Units 1 and 2 Alloy 600 Aging Management Program Response to Request for Additional Information	01/31/12

**Commitment No. 4**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
GT 2011-14985	Assessment of Boric Acid Program	12/29/11
PMI-5032	Boric Acid Corrosion Control Program	5
PMP-5030-001	Boric Acid Corrosion Control	19

**Commitment No. 5**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-EHP-5070-UPTI-001	Underground Piping and Tank Integrity Program	6
EHI-5070-UPTI	Underground Piping and Tanks Integrity Program	9
PMP-5020-001-001	Maintenance Permits	42
WO 55440839	Evaluate Buried Piping Inspection Program	02/06/14

**Commitment No. 6**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
DIT-B-03509-00	Provide the Potential Susceptible RCS Primary Loop (Hot Leg, Cold Leg, Cross-over Leg) Material Heats to Thermal Aging Embrittlement	10/05/12
EHI-5070-CASS	Cast Austenitic Stainless Steel Evaluation Program	1
WCAP-17538-P	Flaw Tolerance Evaluation for Susceptible Reactor Coolant Loop CASS Piping Components for D.C. Cook Units 1 and 2	1

**Commitment No. 7**

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
12-EHP-4030-066-001	Fire Pump Performance and Starting Sequence Tests	2
12-FPP-4030-066-007	Control Room Cable Vault Halon Bottle Surveillance	7
12-FPP-4030-066-017	Inspection of Fire Barrier Penetration Seals	5
12-OHP-4030-066-121FD	Diesel Fire Pump Operability Test	14
2-EHP-4030-166-010	Unit 2 Control Room Cable Vault Low Pressure CO2 Fire Suppression System Surveillance	8
2-EHP-4030-166-020	Unit 2 Auxiliary Cable Vault CO2 Fire Suppression Test	7
2-EHP-4030-166-224	Unit 2 Control Room Cable Vault Halon Fire Protection System Test	4

**Commitment No. 7**

<u>Number</u>	<u>Description or Title</u>	<u>Date</u>
GT 00860170	OE 29697 Conduits have Insufficient Fire Qualification Documentation	11/06/09
GT 00861371	NRC IN 2009-29; Potential Failure of Fire Water Supply Pumps to Automatically Start due to a Fire	02/14/10
WO 55377237	Perform Unit 2 Control Room Cable Vault Halon System Test	02/03/12
WO 55408271	Perform Unit 2 Control Room Cable Vault Low Pressure CO2 Fire Suppression System Surveillance.	12/16/13
WO 55416850	Perform Unit 2 Control Room Cable Vault Halon Weighing Surveillance	07/12/13

**Commitment No. 8**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-FPP-4030-066-005	FP Water System Unobstructed Flow Test	2
12-PPP-4030-066-006	Three Year FP Water System Unobstructed Flow Test	5
2-EHP-4030-166-004	FP Water System Open Head Deluge Air Flow Tests	2
AR 2012-9629	FP Piping Wall Thickness Degraded	08/07/12
AR 2013-7845	FP Piping Plugged	05/28/13
EHI-5054-FPP	Fire Piping UT Inspection	1
GT 2011-12576	OE Intake Sprinkler Piping Plugged with Clay like Debris (Monticello)	10/25/11
GT 2012-9419	License Renewal Implementation Readiness	08/01/12
WO 55369539	UT Inspect FP Piping in the East Diesel Driven Fire Pump Room	01/08/13
WO 55396113	Perform Plant Yard FP Water System Unobstructed Flow Test	02/10/12
WO 55414449	UT Inspect FP Piping Near Unit 1 Auxiliary Building 609 Elevation	04/16/14
WO 55414452	UT Inspect FP Piping in Electric Fire Pump Room	04/16/14

**Commitment No. 9**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-EHP-8913-001-001	Program for Implementing GL 89-13 Inspections	5
12-EHP-8913-001-002	Heat Exchanger Inspection	11
2-QT-506	Perform UT Inspection on Piping Upstream	10/09/16
EHI-5054-HXM	Heat Exchanger Monitoring	7
LR-EAMP-01	Heat Exchanger Monitoring Program	5
LR-HXMP-001	Heat Exchanger Monitoring Program Basis Document	1
WO 55236503	AB Emergency Diesel Lube Oil Cooler	10/06/13
WO 55447321	CD Emergency Diesel Lube Oil Cooler	10/30/16
WO 55449537	RCP Seal Water Cooler	04/10/15
WO 55426923	Heat Exchanger Inspection	09/23/14
WO 55422879	Control Room Air Conditioning North Liquid Chiller	08/15/14



**Commitment No. 10**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date</u></b>
WO 55419027	Perform Online CTS LR Examinations	09/25/13
U2-VE-13-001	Spray Additive Tank Lower Head to Shell Weld	10/14/13
U2-VE-13-002	Tank (TK-36) Elbow to Pipe Weld	10/14/13
U2-VE-13-003	Pipe to Valve (CTS-116) Weld	10/14/13
U2-VE-13-004	Valve (CTS-116) to Tee Weld	10/14/13
U2-VE-13-005	Tee to Pipe (IMO-204) Weld	10/14/13
U2-VE-13-006	Upstream Pipe to Tee (IMO-202) Weld	10/14/13
U2-VE-13-007	Tee to Reducer (CTS-117)	10/14/13
WO 55365738	NQQS, License Renewal Examination on U2 CTS Piping (Completed U2C21)	08/19/13
U2-VE-13-011	Valve (2-CTS-127E) to Downstream Elbow	10/19/13
U2-VE-13-013	Elbow to Pipe Downstream of CTS-127E	10/19/13
WO 55365738	2-CTS-127W, Vendor License Renewal Exam of CTS HDR	08/19/13
U2-VE-13-015	Valve (CTS-127W) to Downstream Elbow	10/19/13
U2-VE-13-016	Elbow to Pipe Downstream of CTS-127W	10/18/13

**Commitment No. 11**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
	License Renewal Application: B.1.19 Instrument Air Quality	10/3
	Control Air Dew Point Trending Results Graph	1/1/12-1/1/14
02-OHL-4030-SOM-048	Unit 2 Tours – U2 Turbine Tech Spec Tour	12
12-THP-6040-PER-005	Control Air Performance Monitoring	14
GT-2011-1619-7	Document a review of NUREG 1801 Generic Aging Lessons Learned (GALL) Revision 2	1/30/12
ISA-S7.3-1975	Quality Standard for Instrument Air	11/16/81
LRP-EAMP-01	Evaluation of Aging Management Program: Instrument Air Quality Program	4
NUREG-1831	Safety Evaluation Report: License Renewal Application for the D. C. Cook Nuclear Plant, Units 1 and 2	0
PMP-2350-CMS-001	Control Air Performance Monitoring Commitment Program Management Implementation/Closure Form	04/08/14
WO-55440269	12-THP-6040-PER-005 Weekly Control Air EPDM	02/05/14
WO-55440819	12-THP-6040-PER-005 Weekly Control Air EPDM	02/12/14
WO-55441218	12-THP-6040-PER-005 Weekly Control Air EPDM	02/19/14
WO-55441624	12-THP-6040-PER-005 Weekly Control Air EPDM	02/21/14
WO-55443230	12-THP-6040-PER-005 Weekly Control Air Dew Points	03/20/14
WO-55443502	12-THP-6040-PER-005 Weekly Control Air Dew Points	03/27/14
WO-555438170	12-THP-6040-PER-005 Weekly Control Air Dew Points	12/26/13

**Commitment No. 12**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
EHI-5054-IMV	Non-EQ Inaccessible Medium-Voltage Cable Program	3
MHI-5097	Medium Voltage Cable Testing	7
LR-CAMP-TanDelta-U2C20	Tangent Delta Cable Testing Report Unit 2 Cycle 20 Refueling Outage	May 2012
WO 55382663-16	Tan Delta Testing on 4kV Buses 2A & 2B Reserve Fed Aux	12/19/11
WO 55404224-01	U2: Cables H1100 Thru H1117 Tan Delta Testing	10/20/16

**Commitment Nos. 13 and 38**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
EHI-5054-ICT	Non-EQ Instrumentation Circuits Test Review Program	1
12-EHP-5030-CAR-001	Characterization Testing Program	7
WO 55433968-01	Non-EQ Instrumentation Circuits Test Review	01/20/14

**Commitment No.14**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Revision</u></b>
12-EHP-5040-ICC-001	Non-EQ Insulated Cables and Connections Program Implementation	4
EHI-5040-ICC	Non-EQ Insulated Cables and Connections Program	1

**Commitment No. 15**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
PMP-2350-CMS-001	Commitment Management Data Sheet 2, Commitment Implementation/Closure Form	12/19/11
WO 55321182	1-OME-4 –Perform ISI Examinations on Pressurizer Spray Nozzle	09/20/11
EHI-5070-PRZ	Pressurizer Examination	0
WO 55378339	EISI: Vendor Examinations on Pressurizer	01/09/12

**Commitment Nos. 16 and 37**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Revision</u></b>
PMP 5030-001-003	Preventive Maintenance	38
MWO 55229937	Perform Inservice Expansion Joint Inspection	NA
MWO 55250359	Replace hoses to support License Renewal Inspection	NA
MWO 55271533	Inspect/Clean/Lube Ventilation Unit	NA
MWO 55263692	Inspect Tank for Degradation per TIP/License Renewal Program	NA
MWO 55349558	Inspect Elastomers (Rubber) of Expansion Joint	NA

**Commitment No. 17**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
EHI-5054-RPV	Reactor Vessel Integrity	1
WO 55386034	Work Request for Unit 2 Standby Surveillance Capsule Testing	06/17/11

**Commitment Nos. 18, 19 and 36**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
PMP-2350-CMS-001	Commitment Change for Reactor Vessel Internals Program	08/11/11
AEP-NRC-2011-38	Donald C. Cook Nuclear Plant Units 1 and 2, Revision to Regulatory Commitments Associated with Application for Renewed Operating Licenses	09/01/11
AEP-NRC-2012-82	Donald C. Cook Nuclear Plant Units 1 and 2, Transmittal of Reactor Vessel Internals Aging Management Program	10/01/12
EHI-5054-RVI	Reactor Vessel Internals Inspection	1

**Commitment No. 20**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
EHI-5054-RVI	Reactor Vessel Internals Inspection	1
AEP-NRC-2014-60	Donald C. Cook Nuclear Plant Units 1 and 2, Final Response to Request for Additional Information Concerning the Reactor Vessel Internals Aging Management Program	10/22/14
AEP-NRC-2012-82	Donald C. Cook Nuclear Plant Units 1 and 2, Transmittal of Reactor Vessel Internals Aging Management Program	10/01/12

**Commitment No. 21 & 41**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
PMP-5030-001-005	Essential Service Water System Inspection	3
12-EHP-8913-001-002	Program for Implementing 89-13 Inspection	11
EHI-5054-HXM	Heat Exchanger Monitoring	7
PMP-5030-001-005	Essential Service Water System Inspection	3
WO 55447321	2-QT-131-CD Disassemble and Inspect	10/30/16
WO 55457780	2-OME-34W Perform VT &Hardness Test of Strainer Body	03/26/16

**Commitment No. 22**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
EHI-5070-SBP	Small Bore Piping	2
WO 55245741	Perform ISI NDE on Welds	10/08/13
WO 55289188	2-CS-119-09, Perform NDE for ISI Examination	04/16/07
WO 55310069	Perform ISI Examinations on FW Components, Line 2-SI-566	02/20/09

**Commitment No. 23**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-EHP-5035-SMP-001	Plant Structure Performance Evaluation And Monitoring Program	15
8263	Commitment Evaluation/Change	09/26/13

**Commitment No. 24**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-EHP-5035-SMP-001	Plant Structure Performance Evaluation and Monitoring Program	15
12-IHP-5021-EMP-060	Auxiliary Building Crane East (12-QM-3E) Inspection and Maintenance	15
12-IHP-5021-EMP-061	Auxiliary Building Crane East (12-QM-3W) Inspection and Maintenance	15
WO 55207015	2-01.1-85, (R2P) INSPECT AND LUBRICATE CRANE	02/28/15
WO 55202276	2-QM-24, INSPECT AND LUBE ELECTRIC HOIST	07/09/14

**Commitment No. 25**

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
12-EHP-5035-SMP-001	Plant Structure Performance Evaluation and Monitoring Program	15
ES-FIRE-0601-QCF	Fire Rated Seals	4

**Commitment No. 26**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
EHI-5054-SYS	System Testing Program	3
2-OHP-4030-203-052E	East Centrifugal Charging Pump Operability Test	19
2-OHP-4030-203-052W	West Centrifugal Charging Pump Operability Test	25
LR-EAMP-01	System Testing Program	5
GT 2013-2037-2	License Renewal GT to Perform Attachment 2 of EHI-5054 5 Year Frequency	03/14/13
AR 2015-16170	Increase in Data Scatter in IST test for CCP mini-flow	12/16/15
OP-2-5129-54	Flow Diagram CVCS – Reactor Letdown and Charging	54
MD-02-ECCS-024-N	Allowable Degradation of the Unit 2 Centrifugal Charging Pump Mini-Flow Orifices	10/29/16
DIT B-00606-00	CVCS Mini Flow Orifice	01/10/00
AR 2014-5950	System Testing Program for License Renewal	04/15/14

**Commitment No. 27**

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
LRP-EAMP-01	Evaluation of Aging Management Program: System Walkdown Program	4
NUREG-1831	Safety Evaluation Report; License Renewal Application for the D. C. Cook Nuclear Plant, Units 1 and 2	0

**Commitment No. 27**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
AEP-NRC-2013-60	10 CFR 50.71 (e) Update and Related Site Changes Report	10/30/13
PMP-2350-CMS-001	System Walkdown Program Enhancement Commitment Management Implementation/Closure Form	08/19/13
EHI-5054-SWD-001	System Walkdowns	10
GT 2015-3016	ACIT-General Action Item Tracking [No Specific Procedure or Program]	03/04/15
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Main Steam and Unit 2 Feedwater	12/29/16
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Fire Protection	11/14/16
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Emergency Diesel Generators	04/21/17
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Residual Heat Removal	04/18/17
AR 2016-11062	U2 RHR Pump and HX Rooms Degraded Paint	10/05/16
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Essential Service Water System	10/26/16
AR 2016-11965	Strainer 2-OME-34E Covers/Auto Vent Piping Needs Painting	10/19/16
AR 2016-11967	Unit 2 East ESW Supply Header Piping Needs Painting	10/19/16
EHI-5054-SWD-001; Att. 1	System Walkdown Report; Unit 2 Non-Essential Service Water System	01/03/17
AR 2016-8940	AR Not Written When Insulation Removal Revealed Corrosion	08/04/16

**Commitment No. 28**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
EHI-5054	Wall Thinning Monitoring Program	0
LR-WTMPB-001	Wall Thinning Monitoring Program Basis Document	2
WO 55441761	Perform UT Inspection on Piping Near 2-WCR-924	03/25/15
WO 55459580	NQQS, 2-WCR-914 UT Inspection for NESW Wall Thinning	03/26/15
WO 55459585	NQQS, 2-WCR-941 UT Inspection for NESW Wall Thinning	03/27/15
AR 2015 4074	NESW Piping Below Operability Limit	03/26/15
AR 2015 4237	NESW Pipe Wall Below Design Limit for 2-WCR-941	03/28/15
AR-2015 4226	NESW Pipe Wall Below Design Limit for 2-WCR-943	03/28/15
AR 2015-4417	NESW Pipe Wall Below Design Limit for 2-WCR-958	03/31/15
AR 2015-4449	NESW Pipe Wall Below Design Limit for 2-WCR-966;	03/31/15

**Commitment No. 29**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
LRP-EAMP-01	Evaluation of Aging Management Program: Water Chemistry Control – Primary and Secondary Water Chemistry Control	4
NUREG-1831	Safety Evaluation Report; License Renewal Application for the D. C. Cook Nuclear Plant, Units 1 and 2	0
THI-6020-ADM-001	Quality Control	6
12-THP-6020-CHM-101	Reactor Coolant System	42
12-THP-6020-CHM-104	Refueling Water Storage Tank	14
12-THP-6020-CHM-201	Steam Generator Chemistry Specifications	33
12-THP-6020-CHM-210	Condensate	10
12-THP-6020-CHM-111	Primary Water Storage Tank and CVCS Monitor Tank #1 & 2	11
CLG-101	Chemistry Lab Guide for Optima 4300 DV ICP-OES	4
GT 2016-0435-4	QHSA Secondary Water Chemistry Control Program	01/12/16
AR 2014-5978	Revise Procedure to Incorporate NRC Commitment	05/15/14
AR 2014-14159	Unit 2 High Feedwater Dissolved Oxygen on Startup	11/11/14
AR 2015-8658	Spike in SG Sodium on U2 From Normal Flash Tank	07/02/15
AR 2015-15828	Elevated Feedwater Iron Transport in U2	12/09/15
DIT-S-06293-00	Input for the 2015 Renewed License UFSAR Update	02/21/15

**Commitment No. 30 and No. 39**

<b><u>Number</u></b>	<b><u>Description or Title</u></b>	<b><u>Date/Revision</u></b>
12-EHP-5070-COT-001-Basis	Chemistry One Time Inspection Program Basis Document	2
12-EHP-5070-COT-001	Chemistry One-Time Inspection Program	3
LRP-EAMP-01	Evaluation of Aging Management Program: Water Chemistry Control – One-Time Inspection Program	4
NUREG-1831	Safety Evaluation Report; License Renewal Application for the D. C. Cook Nuclear Plant, Units 1 and 2	
AR 2012-5827	Glycol Piping Exterior Degradation (Corrosion)	05/02/12
AR 2013-11608	Failure to Perform Inspection Due to System Conditions	08/09/13
AR 2014-1281	Small Amount of Corrosion in the EDG Jacket Water System	01/26/14
GT 00846698	License Renewal Implementation (Y10) for OTI and WTM Program	04/18/12
WO 55432479-02	Replace Mechanical Seal Heat Exchanger	05/06/16
WO 55432479-10	Receive Old Cooler/Perform Inspection	05/15/17
WO 55403404	Install New Glycol Piping	04/06/13
WO 55431894	Replace Capital Cooler	04/04/14
AR 2015-13501	Minor Interior Corrosion in Adjacent Piping	10/16/15

**Commitment No. 30 and No. 39**

<u>Number</u>	<u>Description or Title</u>	<u>Date</u>
AR 2016-10190	Loose and Broken Glycol Piping Insulation Canning/Banding	09/09/16
AR 2017-4225	Damaged Insulation Cause Housekeeping and Slipping Hazard	04/25/17

**Commitment Nos. 31, 33, 35 and 40**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
12-EHP-5040- TCM-001	Transient and Thermal Cycle Monitoring	5
12-THP-5054-FMP	Fatigue Monitoring Program	0
WCAP-16525	Environmental Fatigue Evaluation for D. C. Cook Nuclear Plant	2
LRP-EAMP-01	Evaluation of Aging Management Program: Fatigue Monitoring Program	5
NUREG-1831	Safety Evaluation Report; License Renewal Application for the D. C. Cook Nuclear Plant, Units 1 and 2	0
PMP-2350-CMS-001	Commitment Program Management Implementation/Closure Form for Commitment 8271	05/13/14
PMP-2350-CMS-001	Commitment Program Management Implementation/Closure Form for Commitment 8283	01/24/14
PMP-2350-CMS-001	Commitment Program Management Implementation/Closure Form for Commitment 8293	02/25/14
TACDS-1-017	Total Accumulated Cycle Data Sheet	0
AR 2017-4902	12-EHP-5040-TCM-001 Requirement Not Met	05/12/17

**Commitment No. 32**

<u>Number</u>	<u>Description or Title</u>	<u>Date/Revision</u>
ISG-05, Enc. 1	Interim Staff Guidance on the Identification and Treatment of Electrical Fuse Holders for License Renewal	03/10/03
LRP-EAMR-01, Attachment 2	Aging Management Review for Electrical Systems. Electrical; Holder Review Logic for License Renewal	3

<u>Number</u>	<u>Description or Title</u>	<u>Revision</u>
MD-12-CONT -004-N	Fatigue Analysis of Containment Penetrations	1
SD-011120-001	Design Basis Analysis of Containment Penetrations CPN-2, CPN-3, CPN-4, and CPN-5.	0

## LIST OF ACRONYMS USED

AMP	Aging Management Program
AR	Action Request
ASME	American Society of Mechanical Engineers
B&PV	Boiler and Pressure Vessel
CASS	Cast Austenitic Stainless Steel
CFR	Code of Federal Regulations
EFPY	Effective Full Power Years
ESW	Emergency Service Water
EPRI	Electric Power Research Institute
EQ	Environmental Qualification
GL	Generic Letter
IP	Inspection Procedure
ISI	Inservice Inspection
LRA	License Renewal Application
MRP	Materials Reliability Program
NDE	Non-Destructive Examination
NRC	Nuclear Regulatory Commission
PM	Preventative Maintenance
PWR	Pressurized Water Reactor
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RVI	Reactor Vessel Internals
SER	Safety Evaluation Report
SSC	Structures, System, and Components
UFSAR	Updated Final Safety Analysis Report