Entergy

Entergy Nuclear Operations, Inc.
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Stephen J. Bethay
Director, Nuclear Assessment

December 19, 2007

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

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No. 50-293 License No. DPR-35

License Renewal Application (LRA) Amendment 21

REFERENCES:
1. Entergy letter, License Renewal Application, dated January 25, 2006 (TAC MC9669)
2. Entergy letter, License Renewal Application Annual Update, dated April 18, 2007

LETTER NUMBER: 2.07.096

Dear Sir or Madam:

In Reference 1, Entergy Nuclear Operations, Inc. (Entergy) submitted the License Renewal Application (LRA) for Pilgrim Nuclear Power Station (PNPS). In Reference 2, Entergy submitted the annual LRA update required by 10 CFR 454.21(b). In that letter Entergy concluded that no changes to the CLB had occurred that materially affected the content of the PNPS LRA, including the Safety Analysis Report (SAR) supplement.

Recently, during the process of updating license renewal basis documents to incorporate changes to the original LRA due to LRA amendments and requests for additional information (RAI) submitted to NRC, it was discovered that removal of the clean-up recirculation pump stuffing box cooler, originally identified as only affecting the applicable basis documents, also affected the LRA and SAR supplement. The affected LRA sections include 2 line items from Table 3.3.2-3 (heat exchanger tubes made of copper alloy 15% Zn in treated water (ext.)), Appendix A sections A2.1.16 and A.2.1.26, and Appendix B sections B.1.15 and B.1.24. Attachment 1 to this letter provides the changes to Table 3.3.2-3, Attachment 2 to this letter provides the changes to Appendix A, and Attachment 3 to this letter provides the changes to Appendix B.

The removal of the stuffing box cooler from the plant deletes any requirement to perform inspections of it in the periodic surveillance and preventive maintenance program, and reduces the sample population discussed in the heat exchanger monitoring program. The error is conservative and does not impact the NRC review activities for the PNPS LRA or conclusions reached in the safety evaluation report because the NRC has already reviewed the material/environment/aging effects/program combination for the removed cooler and deleting it does not impact NRC review results. This finding has been entered into the PNPS corrective action system for further evaluation.

There are no new commitments contained in this letter.

If you have any questions, or require additional information, please contact Mr. Joseph R. Lynch, Licensing Manager at (508) 830-8403.

A119
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 19th 2007.

Sincerely,

Stephen J. Bethay
Director, Nuclear Safety Assessment

MJG/dl

Attachments
1. Changes to Table 3.3.2-3
2. Changes to Appendix A
3. Changes to Appendix B

cc: with Attachments

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Attachment 1 to Letter 2.07.096

Changes to

Table 3.3.2-3
(1 page)

Table 3.3.2-3: Reactor Building Closed Cooling Water System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat exchanger (tubes)	Heat transfer	Copper alloy < 15% Zn	Treated water (ext)	Fouling	Water Chemistry Control – Closed Cooling Water	VII.C2-2 (AP-80)	3.3.1-52	B
~~Heat exchanger (tubes)~~	~~Pressure boundary~~	~~Copper alloy > 15% Zn~~	~~Treated water (ext)~~	~~Loss of material~~	~~Water Chemistry Control – Closed Cooling Water~~	~~VII.C2-4 (AP-12)~~	~~3.3.1-51~~	~~D~~
~~Heat exchanger (tubes)~~	~~Pressure boundary~~	~~Copper alloy > 15% Zn~~	~~Treated water (ext)~~	~~Loss of material~~	~~Selective Leaching~~	~~VII.C2-6 (AP-43)~~	~~3.3.1-84~~	~~G, 302~~
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Treated water (ext)	Loss of material – wear	Heat Exchanger Monitoring			H
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Lube oil (ext)	Loss of material	Oil Analysis	VII.C2-5 (AP-47)	3.3.1-26	E
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Lube oil (ext)	Loss of material – wear	Heat Exchanger Monitoring			H
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Air-indoor (ext)	None	None	V.F-3 (EP-10)	3.2.1-53	C
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Air-indoor (ext)	Loss of material - wear	Periodic Surveillance and Preventive Maintenance			H
Heat exchanger (tubes)	Pressure boundary	Copper alloy > 15% Zn	Condensation (ext)	Loss of material	Periodic Surveillance and Preventive Maintenance	VII.F1-16 (A-46)	3.3.1-25	E

Attachment 2 to Letter 2.07.096

Changes to

Appendix A
(4 pages)

A.2.1.14 Fire Water System Program

The Fire Water System Program applies to water-based fire protection systems that consist of sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, and aboveground and underground piping and components that are tested in accordance with applicable National Fire Protection Association (NFPA) codes and standards. Such testing assures functionality of systems. To determine if significant corrosion has occurred in water-based fire protection systems, periodic flushing, system performance testing and inspections are conducted. Also, many of these systems are normally maintained at required operating pressure and monitored such that leakage resulting in loss of system pressure is immediately detected and corrective actions initiated.

In addition, wall thickness evaluations of fire protection piping are periodically performed on system components using non-intrusive techniques (e.g., volumetric testing) to identify evidence of loss of material due to corrosion.

A sample of sprinkler heads will be inspected using the guidance of NFPA 25 (2002 Edition) Section 5.3.1.1.1, which states, "Where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." This sampling will be repeated every 10 years after initial field service testing.

A.2.1.15 Flow-Accelerated Corrosion Program

The Flow-Accelerated Corrosion Program applies to safety-related and nonsafety-related carbon steel components in systems containing high-energy fluids carrying two phase or single-phase high-energy fluid > 2% of plant operating time.

The program, based on EPRI recommendations for an effective flow-accelerated corrosion program, predicts, detects, and monitors FAC in plant piping and other pressure retaining components. This program includes (a) an evaluation to determine critical locations, (b) initial operational inspections to determine the extent of thinning at these locations, and (c) follow-up inspections to confirm predictions. The program specifies repair or replacement of components as necessary.

A.2.1.16 Heat Exchanger Monitoring Program

The Heat Exchanger Monitoring Program inspects heat exchangers for degradation. If degradation is found, then an evaluation is performed to evaluate its effects on the heat exchanger's design functions including its ability to withstand a seismic event.

Representative tubes within the population of heat exchangers are eddy current tested at a frequency determined by internal and external operating experience to ensure that effects of aging are identified prior to loss of intended function. Along with each eddy current test, visual inspections are performed

on accessible heat exchanger heads, covers and tube sheets to monitor surface condition for indications of loss of material. The population of heat exchangers includes the RHR heat exchangers, core spray pump motor thrust bearing lube oil coolers, HPCI gland seal condenser, HPCI turbine lube oil cooler, RCIC lube oil cooler, recirculation pump motor generator set fluid coupling oil and bearing coolers, CRD pump oil coolers, recirculation pump motor lube oil coolers, clean up recirculation pump lube oil coolers ~~and stuffing box cooler~~, and EDG lube oil coolers.

A.2.1.17 Inservice Inspection - Containment Inservice Inspection (CII) Program

The Containment Inservice Inspection Program outlines the requirements for the inspection of Class MC pressure-retaining components (primary containment) and their integral attachments in accordance with the requirements of 10 CFR 50.55a(b)(2) and the 1998 Edition of ASME Section XI with 2000 Addenda, Inspection Program B.

The primary inspection method for the primary containment and its integral attachments is visual examination. Visual examinations are performed either directly or remotely with illumination and resolution suitable for the local environment to assess general conditions that may affect either the containment structural integrity or leak tightness of the pressure retaining component. The program includes augmented ultrasonic exams to measure wall thickness of the containment drywell structure.

A.2.1.18 Inservice Inspection – Inservice Inspection (ISI) Program

The ISI Program is based on ASME Inspection Program B (Section XI, IWA-2432), which has 10-year inspection intervals. Every 10 years the program is updated to the latest ASME Section XI code edition and addendum approved in 10 CFR 50.55a. On July 1, 2005 PNPS entered the fourth ISI interval. The code edition and addenda used for the fourth interval is the 1998 Edition with 2000 Addenda.

The program consists of periodic volumetric, surface, and visual examination of components and their supports for assessment, signs of degradation, flaw evaluation, and corrective actions.

A.2.1.19 Instrument Air Quality Program

The Instrument Air Quality Program ensures that instrument air supplied to components is maintained free of water and significant contaminants, thereby preserving an environment that is not conducive to loss of material. Dewpoint, particulate contamination, and hydrocarbon concentration are periodically checked to verify the instrument air quality is maintained.

One-time inspection activities on

- internal surfaces of buried carbon steel pipe on the standby gas treatment system discharge to the stack,
- internal surfaces of compressed air and EDG system components containing untreated air,
- internal surfaces of stainless steel radioactive waste and sanitary soiled waste and vent system components containing untreated water,
- small bore piping in the reactor coolant system and associated systems that form the reactor coolant pressure boundary,
- reactor vessel flange leak-off line, and
- main steam flow restrictors

are used to confirm that loss of material, cracking, and reduction of fracture toughness, as applicable, are not occurring or are so insignificant that an aging management program is not warranted.

When evidence of an aging effect is revealed by a one-time inspection, routine evaluation of the inspection results will identify appropriate corrective actions.

A.2.1.26 Periodic Surveillance and Preventive Maintenance Program

The Periodic Surveillance and Preventive Maintenance Program includes periodic inspections and tests that manage aging effects not managed by other aging management programs. The preventive maintenance and surveillance testing activities are generally implemented through repetitive tasks or routine monitoring of plant operations.

Temperatures are monitored during periodic emergency diesel generator (EDG), station blackout diesel, and security diesel surveillance tests to verify that associated heat exchangers are capable of removing the required amount of heat, thereby managing fouling of the heat exchanger tubes.

Periodic inspections using visual or other non-destructive examination techniques verify that the following components are capable of performing their intended function.

- reactor building crane, rails, and girders
- refueling platform carbon steel components
- main stack components
- standby liquid control system discharge accumulators
- carbon steel piping in the waterline region of the torus
- HPCI gland seal condenser blower and suction piping
- RCIC steam supply and exhaust piping downstream of the strainers and steam traps
- standby gas treatment system expansion joints, demister drain valves and demister drain piping

- drain lines from each reactor building auxiliary bay passing into the water trough in the torus
- ~~clean-up recirculation pump P-204B stuffing box cooler~~
- RBCCW copper alloy cooling coils
- EDG, station blackout diesel, and security diesel intake air, air start, and exhaust components
- EDG, station blackout diesel, and security diesel jacket water radiators
- security diesel oil cooler and aftercooler
- area coolers VAC-210A/B, VAC-202A/B, and VAC-204A/B/C/D
- VSF-103A/B, VAC-202A/B, VAC-204A/B/C/D, and EDG engine driven fan duct flexible connections
- condensate storage tanks
- circulating water, potable & sanitary water, radioactive waste, sanitary soiled waste & vent, plumbing and drains and screen wash system components
- flex/expansion joints in the circulating water, HVAC/chilled water, and radioactive waste systems

A.2.1.27 Reactor Head Closure Studs Program

The Reactor Head Closure Studs Program includes inservice inspection (ISI) in conformance with the requirements of the ASME Code, Section XI, Subsection IWB, and preventive measures (e.g. rust inhibitors, stable lubricants, appropriate materials) to mitigate cracking and loss of material of reactor head closure studs, nuts, washers, and bushings.

A.2.1.28 Reactor Vessel Surveillance Program

PNPS is a participant in the BWR vessel and internals project (BWRVIP) Integrated Surveillance Program (ISP) as incorporated into the plant Technical Specifications by License Amendment 209. The Reactor Vessel Surveillance Program monitors changes in the fracture toughness properties of ferritic materials in the reactor pressure vessel (RPV) beltline region. As BWRVIP-ISP capsule test reports become available for RPV materials representative of PNPS, the actual shift in the reference temperature for nilductility transition of the vessel material may be updated. In accordance with 10 CFR 50 Appendices G and H, PNPS reviews relevant test reports to assure compliance with fracture toughness requirements and P-T limits.

BWRVIP-116, "BWR Vessel and Internals Project Integrated Surveillance Program (ISP) Implementation for License Renewal," describes the design and implementation of the ISP during the period of extended operation. BWRVIP-116 identifies additional capsules, their withdrawal schedule, and contingencies to ensure that the requirements of 10 CFR 50 Appendix H are met for the period of extended operation.

Attachment 3 to Letter 2.07.096

Changes to

Appendix B
(3 pages)

B.1.15 HEAT EXCHANGER MONITORING

Program Description

There is no corresponding NUREG-1801 program.

The Heat Exchanger Monitoring Program will inspect heat exchangers for degradation. If degradation is found, then an evaluation will be performed to evaluate its effects on the heat exchanger's design functions including its ability to withstand a seismic event.

Representative tubes within the sample population of heat exchangers will be eddy current tested at a frequency determined by internal and external operating experience to ensure that effects of aging are identified prior to loss of intended function. Along with each eddy current test, visual inspections will be performed on accessible heat exchanger heads, covers and tube sheets to monitor surface condition for indications of loss of material. The sample population of heat exchangers includes the RHR heat exchangers, core spray pump motor thrust bearing lube oil coolers, HPCI gland seal condenser, HPCI turbine lube oil cooler, RCIC lube oil cooler, recirculation pump motor generator set fluid coupling oil and bearing coolers, CRD pump oil coolers, recirculation pump motor lube oil coolers, clean up recirculation pump lube oil coolers ~~and stuffing box cooler~~, and EDG lube oil coolers.

The program will be initiated prior to the period of extended operation.

Evaluation

1. Scope of Program

The Heat Exchanger Monitoring Program will manage aging effects on selected heat exchangers in various systems as identified in aging management reviews.

2. Preventive Actions

This is an inspection program and no actions are taken as part of this program to prevent degradation.

3. Parameters Monitored/Inspected

Where practical, eddy current inspections of shell-and-tube heat exchanger tubes will be performed to determine tube wall thickness. Visual inspections will be performed on heat exchanger heads, covers and tube sheets where accessible to monitor surface condition for indications of loss of material.

B.1.24 PERIODIC SURVEILLANCE AND PREVENTIVE MAINTENANCE

Program Description

There is no corresponding NUREG-1801 program.

The PNPS Periodic Surveillance and Preventive Maintenance Program includes periodic inspections and tests that manage aging effects not managed by other aging management programs. The preventive maintenance and surveillance testing activities are generally implemented through repetitive tasks or routine monitoring of plant operations. Credit for program activities has been taken in the aging management review of the following systems and structures.

reactor building	Perform visual or other non-destructive examination to manage loss of material for the reactor building crane, rails, and girders and refueling platform carbon steel components.
process facilities	Visually inspect the main stack components to manage loss of material for carbon steel and cracking, spalling, or loss of material for concrete.
standby liquid control system	Use UT or other NDE techniques to verify remaining wall thickness to manage loss of material from internal surfaces of the carbon steel discharge accumulators.
automatic depressurization system	Use visual or other NDE techniques to inspect torus to manage loss of material for carbon steel piping in the waterline region of the torus.
high pressure coolant injection system	Use visual or other NDE techniques to inspect a representative sample of the internals of gland seal condenser blower (P-223) and suction piping to manage loss of material.
reactor core isolation cooling system	Use visual or other NDE techniques to inspect a representative sample of RCIC steam supply and exhaust piping downstream of the strainers and steam traps to manage loss of material.

standby gas treatment system	Perform a visual inspection of accessible expansion joints for cracks. Also perform manual flexing (manipulation) of the expansion joints to determine if they have become brittle. These inspections will verify the absence of significant change in material properties.
	Use visual or other NDE techniques to inspect internal surfaces of the valve bodies and piping in the demister drains to manage loss of material.
	Use visual or other NDE techniques to inspect a representative sample of the internal and external surfaces of the drain lines from each reactor building auxiliary bay passing into the water trough in the torus room to manage loss of material.
reactor building closed cooling water system	~~Use visual or other NDE techniques to inspect clean-up recirc pump P-204B stuffing box cooler to manage loss of material due to wear.~~
	Use visual or other NDE techniques to inspect a representative sample of the in-scope RBCCW copper alloy cooling coils to manage loss of material.
emergency diesel generator system	Use visual or other NDE techniques to inspect a representative sample of EDG intake air, air start, and exhaust components to manage loss of material and fouling.
	Visually inspect A/B EDG jacket water radiators to manage loss of material and fouling.
	Perform EDG surveillance test (loaded) to manage fouling for heat exchanger tubes.