



Entergy Nuclear Operations, Inc.  
Pilgrim Station  
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Plymouth, MA 02360

Stephen J. Bethay  
Director, Nuclear Assessment

August 22, 2006

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 Amendment 6

REFERENCE: Entergy letter, License Renewal Application,  
dated January 25, 2006 (2.06.003)

LETTER NUMBER: 2.06.074

Dear Sir or Madam:

In the referenced letter, Entergy Nuclear Operations, Inc. applied for renewal of the Pilgrim Station operating license. NRC TAC NO. MC9669 was assigned to the application.

This amendment to the License Renewal Application (LRA) consists of four attachments. Attachment A contains the response to the request for additional information (RAI) on LRA Section 2.1 (Scoping and Screening Methodology) conveyed in NRC letter dated July 25, 2006. Attachment B contains the response to the RAIs on LRA Sections 2.3.3.9 (Fire Protection System – Water) and 2.3.3.10 (Fire Protection System – Halon) conveyed in NRC letter dated July 26, 2006. Attachment C contains the response to the RAIs on LRA Section 2.5 (Scoping and Screening Results: Electrical and Instrumentation and Control Systems) conveyed in NRC letter dated July 31, 2006. Attachment D contains a replacement of LRA Appendix E (Environmental Report) Section 2.6.2 (Minority and Low-Income Populations) and new Tables 2-3a, 2-3b, and 2-3c and Figures 2-13 through 2-21.

This letter contains no new or revised commitments.

Please contact Mr. Bryan Ford, at (508) 830-8403, if you have any questions regarding this subject.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 22, 2006.

Sincerely,

A handwritten signature in black ink that reads "Stephen J. Bethay".

Stephen J. Bethay  
Director, Nuclear Safety Assessment

DWE/dm

Attachments: (as stated)

cc: see next page

A119

Entergy Nuclear Operations, Inc.  
Pilgrim Nuclear Power Station

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**ATTACHMENT A to Letter 2.06.074**

(5 pages)

Response to Request for Additional Information (RAI) on  
LRA Section 2.1 (Scoping and Screening Methodology)

## **RAI 2.1-1: Review Methodology for Non-Accident Design Basis Events**

10 CFR 54.4(a)(1) states, in part, that systems, structures, and components (SSCs) within the scope of license renewal include safety-related SSCs which are those relied upon to remain functional during and following design basis events (as defined in 10 CFR 50.49(b)(1)).

10 CFR 50.49, states that design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed. In regard to identification of design basis events, Section 2.1.3, "Review Procedures," of NUREG-1800 states:

The set of design basis events as defined in the rule is not limited to Chapter 15 (or equivalent) of the [updated final safety analysis report] (UFSAR). Examples of design basis events that may not be described in this chapter include external events, such as floods, storms, earthquakes, tornadoes, or hurricanes, and internal events, such as a high-energy-line break. Information regarding design basis events as defined in 10 CFR 50.49(b)(1) may be found in any chapter of the facility UFSAR, the Commission's regulations, NRC orders, exemptions, or license conditions within the [current licensing basis] (CLB). These sources should also be reviewed to identify systems, structures and components that are relied upon to remain functional during and following design basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the functions described in 10 CFR 54.4(a)(1).

During the scoping and screening methodology audit, the NRC staff questioned how non-accident design basis events, particularly design basis events that may not be described in the UFSAR, were considered during scoping. The NRC audit team noted that limiting the review of design bases events to those described in the UFSAR accident analysis could result in omission of safety-related functions described in the CLB.

The staff, therefore, requests the applicant to provide:

- a. A list of the design basis events evaluated as part of the license renewal scoping process.
- b. A description of the methodology used to ensure that all design basis events (including conditions of normal operation, anticipated operational transients, design basis accidents, external events, and natural phenomena) were addressed during license renewal scoping evaluation.
- c. A list of the documentation sources reviewed to ensure that all design basis events were identified.

If, in addressing the above issues, the applicant's review indicates that additional scoping evaluations are required, describe these additional scoping evaluations to address the 10 CFR 54.4(a)(1) criteria. As applicable, list any additional SSCs included within the scope as a result of these efforts, and list those structures and components for which aging management reviews (AMRs) were conducted. For each structure or component describe the aging management programs (AMPs), as applicable, to be credited for managing the identified aging effects.

## **RAI 2.1-1 Response**

- a. The design basis events encompassed in the license renewal scoping process include the following.
- Abnormal operational transients (UFSAR Table 14.4-1, "List of Transient Events")
  - Design basis accidents (UFSAR Section 14.5)
  - External events and natural phenomena (high winds, storm flooding, and seismic events evaluated in UFSAR Chapter 2)
- b. Scoping evaluations relied on the safety classification process to ensure that all design basis events (including conditions of normal operation, anticipated operational transients, design basis accidents, external events, and natural phenomena) were addressed during license renewal scoping. Scoping included those systems, structures and components that are classified as safety-related for PNPS.

The safety classification process is based on the Q-list procedure. During design basis events, unacceptable consequences are avoided by the successful performance of safety actions, which are defined in the Q-list procedure as a collection of activities performed by plant systems or personnel to ensure achievement of one or more of the primary safety goals during and following a design basis event. The primary safety goals, as defined in the procedure, correspond to 10 CFR 54.4(a)(1)(i) - (iii). Safety-related equipment is credited to perform safety actions. The safety actions listed in the Q-list procedure encompass the actions necessary to maintain the reactor coolant pressure boundary (RCPB), shutdown the reactor and maintain safe shutdown condition, and prevent or mitigate off-site releases for design basis events. The safety actions include protection from external events analyzed for the PNPS design basis. Systems and equipment necessary to perform safety functions defined in 10 CFR 54.4(a)(1)(i) - (iii) are classified as safety-related without exclusion of any design basis events.

- c. As indicated in the response to (a) and (b) above, documentation sources reviewed to ensure that all design basis events were identified are the UFSAR and the site Q list.

No additional scoping evaluations were required as a result of addressing these issues.

## **RAI 2.1-2: 10 CFR 54.4(a)(2) Scoping Criteria for Nonsafety-related SSCs**

NRC Regulatory Guide 1.188 (Reg. Guide 1.188), "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses," Revision 1, dated September 2005, (Reg. Guide 1.188) provided NRC endorsement on the use of NEI 95-10, "Industry Guidelines for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 6, dated June 2005, (NEI 95-10). Reg. Guide 1.188 indicated that NEI 95-10, Revision 6, provides methods that the NRC staff considers acceptable for complying with the requirements of 10 CFR Part 54 for preparing a license renewal application (LRA).

NEI 95-10, Appendix F, "Industry Guidance on Revised 54.4(a)(2) Scoping Criterion (Non-Safety Affecting Safety)," (NEI 95-10, Appendix F) discusses non-safety SSCs directly connected to safety-related SSCs. NEI 95-10, Appendix F states, in part, that an equivalent anchor may be defined in the CLB, or may consist of a large piece of plant equipment or series of supports that have been evaluated as a part of a plant-specific piping design analysis. Additionally, the guidance states that an applicant may use a combination of restraints or supports, such that the non-safety piping and associated structures and components attached to safety-related piping, is included in the scope up to a boundary point that encompasses at least two supports in each of three orthogonal directions. The guidance in NEI 95-10, Appendix F also describes as an alternative to identifying a seismic anchor or series of equivalent anchors, the use of bounding criteria which includes using a base-mounted component, a flexible connection, or the free end of the piping run as the end point for the portion of the non-safety piping attached to the safety-related piping to be included in the scope of license renewal.

Section 2.1.1.2.2, "Physical Failure of Nonsafety-related SSCs," of the LRA states the following: For Pilgrim Nuclear Power Station (PNPS), the "structural boundary" is defined as the portion of a piping system outside the safety class pressure boundary, yet relied upon to provide structural support for the pressure boundary.

Section 2.1.2.1.2, "Identifying Components Subject to Aging Management Review Based on Support of an Intended Function for 10 CFR 54.4(a)2," of the LRA states the following:

Nonsafety-related piping systems connected to safety-related systems were included up to the structural boundary or to a point that includes an adequate portion of the nonsafety-related piping run to conservatively include the first seismic or equivalent anchor. An equivalent anchor is a combination of hardware or structures that together are equivalent to a seismic anchor. A seismic anchor is defined as hardware or structures that, as required by analysis, physically restrain forces and moments in three orthogonal directions. The physical arrangement as analyzed insures that the stresses that are developed in the safety related piping and supports are within the applicable piping and structural code acceptance limits. This approach included piping beyond the safety/non-safety interface up to a base mounted component, flexible connection, or the end of a piping run (such as a drain line). This is consistent with the guidance in NEI 95-10, Appendix F.

Based on a review of the LRA, the applicant's scoping and screening implementation procedures, and discussions with the applicant, the NRC staff determined that additional information is required with respect to certain aspects of the applicant's evaluation of the 10 CFR 54.4(a)(2) criteria. The staff requests the applicant to provide the following information:

- a. Indicate how the structural boundary, which includes the portion of the non-safety piping system outside the safety-related pressure boundary and relied upon to provide

structural support for the pressure boundary, was developed. Include a description of the analysis performed to identify the portion of non-safety piping and components required to support the integrity of the safety-related piping and components.

- b. Indicate whether equivalent anchors, outside of the analyzed structural boundary and not including the bounding condition terminations (base-component, flexible connection, and end of the piping run), were used. If equivalent anchors, outside of the analyzed structural boundary and not including the bounding condition terminations, were not used, items (c) and (d) below do not need to be addressed.
- c. If equivalent anchors, as described in item (b) above, were used, indicate the definition of equivalent anchor which was used for the purpose of the 10 CFR 54.4(a)(2) evaluation and how the definition corresponds to the CLB and to the definition of equivalent anchor listed in NEI 95-10 Appendix F.
- d. If equivalent anchors, as described in item (b) above, were used, indicate the number and location of equivalent anchors (i.e., extent of condition).

In addressing each of the above issues, if the review indicates that use of the scoping methodology precluded the identification of any non-safety SSCs that could interact with safety-related SSCs, describe any additional scoping evaluations to be performed to address the 10 CFR 54.4(a)(2) criteria.

As part of your response, list any additional SSCs included within the scope as a result of your efforts, and list those structures and components for which AMRs were conducted. For each structure and component, describe the AMPs, as applicable, to be credited for managing the identified aging effects.

#### **RAI 2.1-2 Response**

- a. The structural boundary was developed through a review of the drawings prepared to indicate portions of systems that support system intended functions. The drawings were reviewed to identify safety/nonsafety interfaces. Nonsafety-related piping systems connected to safety-related systems were included to a point that includes enough of the nonsafety-related piping run to conservatively include the first seismic or equivalent anchor. This approach included piping beyond the safety/nonsafety interface up to a base-mounted component, flexible connection, or the end of a piping run (such as a drain line). No new piping stress analysis was performed to identify the portion of non-safety piping and components required to support the integrity of the safety-related piping and components and no isometric drawings were developed to identify the structural boundary. Existing drawings and the results of existing analyses as reflected on those drawings were used to develop the structural boundary. The use of this scoping method did not preclude the identification of any nonsafety-related SSCs that could interact with safety-related SSCs.
- b. Equivalent anchors other than the analyzed structural boundaries and the bounding condition terminations as defined in NEI 95-10 Appendix F were not used to develop the structural boundaries.
- c. Not applicable.
- d. Not applicable.

**RAI 3.0-X: Quality Assurance Program Attributes in Appendix A, "Updated Safety Analysis Report Supplement," and Appendix B, "Aging Management Programs and Activities"**

The NRC staff reviewed the applicant's AMPs described in Appendix A, "Updated Safety Analysis Report Supplement," and Appendix B, "Aging Management Programs and Activities," of the LRA, and LRPD-02, "Aging Management Program Evaluation Report," Revision 1. The purpose of this review was to ensure that the quality assurance attributes (corrective action, confirmation process, and administrative controls) were consistent with the staff's guidance described in NUREG-1800, Section A.2, "Quality Assurance for Aging Management Programs (Branch Technical Position IQMB-1)."

Based on the NRC staff's evaluation, the descriptions of the AMPs and their associated quality attributes provided in Appendix A, Section A.2.1, and Appendix B, Section B.0.3, of the LRA are consistent with the staff's position regarding quality assurance for aging management. However, the description of the corrective action attribute in Section 2.0 of LRPD-02 did not credit the 10 CFR Part 50, Appendix B, quality assurance program.

Therefore, the NRC staff requests that the applicant clarify that the same corrective action program will be applied to all AMPs and that this program meets the requirements of 10 CFR Part 50, Appendix B.

**RAI 3.0-X Response**

LRA Appendix A Section A.2.1 is revised to include the following.

The corrective action controls of the Entergy (10 CFR Part 50, Appendix B) Quality Assurance Program are applicable to all aging management programs and activities that will be required during the period of extended operation.



**ATTACHMENT B to Letter 2.06.074**

**(8 pages)**

**Response to RAIs on LRA Sections 2.3.3.9 and 2.3.3.10  
(Fire Protection Systems)**

## **Section 2.3.3.9      Fire Protection System–Water**

### **RAI 2.3.3.9-1**

LRA drawings LRA-M-218-SH-01-0, LRA-M-218-SH-06-0, and LRA-M-218-SH-08-0 show the sprinkler and water spray systems for the turbine lube oil storage and conditioning as out of scope (i.e., not colored in orange). Please verify whether the turbine lube oil storage sprinkler system, conditioning room ceiling sprinkler system, and conditioning pre-action water spray system, are in scope of license renewal in accordance with 10 CFR 54.4(a) and subject to an AMR in accordance with 10 CFR 54.21(a)(1). If they are excluded from the scope of license renewal and not subject to an AMR, provide justification for the exclusion.

### **RAI 2.3.3.9-1 Response**

As described in Section 2.3.3.9 of the LRA, the fire protection system has no intended functions for 10 CFR 54.4(a)(1).

The fire protection–water system has the following intended function for 10 CFR 54.4(a)(2).

- Maintain integrity of nonsafety-related components such that no physical interaction with safety-related components could prevent satisfactory accomplishment of a safety function.

The fire protection–water system and the fire protection–Halon system have the following intended function for 10 CFR 54.4(a)(3).

- The system is credited in the Appendix R safe shutdown analysis (10 CFR 50.48).

Therefore, the fire protection system is in scope for license renewal.

The turbine lube oil reservoir pre-action sprinkler subsystem, turbine lube oil storage room and ceiling sprinkler subsystems, and turbine lube oil conditioning pre-action water spray subsystem do not mitigate fires in areas containing equipment important to safe shutdown of the plant, nor are they credited with achieving safe shutdown in the event of a fire. These subsystems are designated nonFP-Q on the LRA drawings, indicating that they are only required to meet state, municipal, or insurance requirements. Therefore, these subsystems are not included in the aging management review summarized in LRA Table 3.3.2-9.

However, water-filled components in the fire protection system not covered in LRA Section 2.3.3.9 that could affect safety-related equipment require aging management review per 10 CFR 54.4(a)(2) due to potential spatial interaction. Therefore, these subsystems are subject to aging management review and are addressed in LRA Table 3.3.2-14-12. As stated in LRA Section 2.1.2.1.3, components subject to aging management review solely due to physical interaction under 10 CFR 54.4(a)(2) are not highlighted on the LRA drawings.

### **RAI 2.3.3.9-2**

LRA drawing LRA-M-218-SH-02-0 shows the piping downstream of the city water supply as out of scope. With the city water supply serving as an alternate supply for the fire water system, please confirm and explain whether this line should be in scope for license renewal and subject to an AMR. If not, please explain the basis.

### **RAI 2.3.3.9-2 Response**

The site fire water system takes suction from two 250,000-gallon water tanks devoted exclusively to fire protection. Although the city water supply may serve as an alternate supply for the fire water system, this source of water is not necessary to meet the requirements of 10 CFR 50.48. This source of water is designated nonFP-Q on LRA drawing LRA-M-218-SH-02-0, indicating that it is only required to meet state, municipal, or insurance requirements. Also, since it is outdoors away from safety-related equipment, the city water supply to the fire protection system cannot affect safety-related equipment per 10 CFR 54.4(a)(2) due to potential spatial interaction. Therefore, the city water supply to the fire water system is not in scope nor highlighted on LRA-M-218-SH-02-0 as subject to aging management review.

### **RAI 2.3.3.9-3**

LRA Table 2.3.3-9 excludes several components shown in color (i.e., in scope) in the LRA drawing LRA-M-218-SH-01-0. For example, a reducer flange is shown in zone C-4 of the drawing and appears to restrict flow to the associated fire hose station. A blind flange is shown in zone F-6 in the reactor auxiliary bay. "Street box" housing is indicated in zone E-2. An unknown function or component is indicated by small trapezoid symbols shown mainly in headers upstream of hose stations in several buildings. An unknown function or component is indicated by a semi-circle symbol in zone F-4 located along a 2.5-inch line upstream of two hose stations in the reactor building. Please confirm and explain whether these components should be included in Table 2.3.3-9, as passive components within scope for license renewal and subject to an AMR. If not, please justify the exclusion.

### **RAI 2.3.3.9-3 Response**

LRA section 2.0 states that the term "piping" in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. If such components have unique tag numbers or the specific component has a function other than pressure boundary, then flow elements, orifices and thermowells are identified as a separate component type.

The small trapezoidal symbols are reducers and the semi-circle in zone F-4 is a weld cap. The reducers and weld cap are passive components subject to aging management review. They are included in the "piping" line item in Table 2.3.3-9.

The "street box" housing in zone E-2 of LRA-M-218-SH-01-0 is a housing around the extension rod used to operate the buried valve. The street box does not perform a component intended function (defined in Table 2.0-1 of the LRA) and therefore is not subject to aging management review.

#### **RAI 2.3.3.9-4**

LRA Table 2.3.3-9 excludes several types of FP Water System components that appear in the SE and its supplements and/or UFSAR, and which also appear in the LRA drawings colored in orange. These components are listed below.

- hose station
- hose connections
- pipe fittings
- couplings
- threaded connections
- restricting orifices
- interface flanges
- chamber housing
- actuator housing (e.g., weight releasing cabinet housing)

For each, please determine whether the component should be included in Table 2.3.3.9, and if not, please provide the basis for the exclusion.

#### **RAI 2.3.3.9-4 Response**

- hose station – Since they support criterion (a)(3) equipment, hose stations are included in the structural aging management review. They are included in the “Fire hose reels” line item in LRA Table 2.4-6.
- hose connections – Hose connections are included in the “Piping” line item in LRA Table 2.3.3-9.
- pipe fittings – As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. Pipe fittings are included in the “Piping” line item in LRA Table 2.3.3-9.
- couplings – As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. Couplings are pipe fittings included in the “Piping” line item in LRA Table 2.3.3-9.
- threaded connections – As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. Threaded connections are pipe fittings included in the “Piping” line item in LRA Table 2.3.3-9.
- restricting orifices – As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. Restricting orifices are included in the “Piping” line item in LRA Table 2.3.3-9.
- interface flanges – As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. Interface flanges are pipe fittings included in the “Piping” line item in LRA Table 2.3.3-9.
- chamber housing – Retard chamber housings in sprinkler subsystems are included in “tank” line item in LRA Table 2.3.3-9.
- actuator housing (e.g., weight releasing cabinet housing) – Actuator housing is part of the active component “actuator” that is not subject to aging management review.

#### **RAI 2.3.3.9-5**

LRA Table 2.3.3-9 excludes other component types such as gear boxes, gauge snubbers, etc. Please determine whether these and/or additional component types are in scope and subject to an AMR, and should be included in Table 2.3.3-9. If not, please justify the exclusion.

#### **RAI 2.3.3.9-5 Response**

Gear boxes are active components not subject to aging management review. Gauge snubbers in the tubing to instruments are included in the "Tubing" line item in LRA Table 2.3.3-9.

#### **RAI 2.3.3.9-6**

LRA Tables 2.4-2, 2.4-3, 2.4-4, and 2.4-6 exclude noncombustible shields and curbs (and scuppers) from the list of structural FP components in scope for license renewal and subject to an AMR. Section 3.1.11 of the SE discusses the use of noncombustible shields between feedwater pumps to prevent oil release from one pump impinging on the other pumps. Sections 3.1.11 and 4.8 of the SE discuss the use of curbs (and scuppers) in the diesel oil day tank rooms to contain potential oil spills and prevent them from spreading to other fire areas in the event of an oil fire. Please determine whether noncombustible shields and curbs (and scuppers) should be included as components in scope for license renewal and subject to an AMR.

#### **RAI 2.3.3.9-6 Response**

The noncombustible shields between the feedwater pumps are subject to aging management review. The shields are composed of galvanized unistrut frames and marine boards. The marine board is included in the "fire wrap" line item under elastomers and other materials in LRA Table 2.4-6. The frames are included in the "instrument racks, frames, and tubing trays" line item under steel and other metals in LRA Table 2.4-6.

LRA Table 2.4-6 also lists steel and concrete flood curbs as components subject to aging management review which includes the curbs in the diesel oil day tank rooms. Scuppers are openings in the curbs rather than separate components.

#### **RAI 2.3.3.9-7**

LRA Table 2.4-6 excludes smoke seals and fire retardant coatings from the list of structural bulk commodities components in scope for license renewal and subject to an AMR. The SE supplement dated March 24, 1988, discusses the installation of smoke seals in electrical conduits that pass through fire barriers and between fire areas. Sections 3.2.4 and 4.11 of the SE discuss the use of fire retardant coatings to protect polyvinyl chloride jacketed cables where the cables are not installed in enclosed cable trays. Please determine whether these two components should be in scope and subject to an AMR, and justify exclusion if they are out of scope.

#### **RAI 2.3.3.9-7 Response**

Smoke seals and fire retardant coatings are included in line items "fire stops" and "fire wraps" in LRA Table 2.4-6.

#### **RAI 2.3.3.9-8**

Section 4.3.5 of the SE discusses automatic water spray for the main power transformer, auxiliary transformer, and shutdown transformer. However, LRA drawing LRA-M-218-SH-01-0 and LRA-M-218-SH-05-0 show the Main Transformer Sprinkler System, Auxiliary Transformer Sprinkler System, Startup Transformer Sprinkler System, and Shutdown Transformer Sprinkler System, as out of scope of license renewal and AMR. Please confirm and explain whether these transformer sprinkler systems should be within scope for license renewal and subject to an AMR.

#### **RAI 2.3.3.9-8 Response**

As described in LRA Section 2.3.3.9, the fire protection system is in the scope of license renewal for 10 CFR 54.4(a)(3) because it is credited in the Appendix R safe shutdown analysis (10 CFR 50.48).

The main transformer sprinkler subsystem, auxiliary transformer sprinkler subsystem, startup transformer sprinkler subsystem, and shutdown transformer sprinkler subsystem do not mitigate fires in areas containing equipment important to safe operation of the plant, nor are they credited with achieving safe shutdown in the event of a fire. These subsystems are designated nonFP-Q on the LRA drawings, indicating that they are only required to meet state, municipal, or insurance requirements. Therefore, these subsystems are not included in the aging management review summarized in LRA Table 3.3.2-9.

The main transformer sprinkler subsystem, auxiliary transformer sprinkler subsystem, startup transformer sprinkler subsystem, and shutdown transformer sprinkler subsystem are deluge systems that do not normally contain water. Therefore, these subsystems do not require aging management review per 10 CFR 54.4(a)(2) due to potential spatial interaction.

#### **RAI 2.3.3.9-9**

Section 4.3.5 of the SE states that new sprinkler systems were proposed for the radwaste truck loading area and the access control area of the radwaste and control building. PNPS UFSAR Section 10.8.3.1 identifies sprinkler system FP for the access control area (i.e., wet pipe) and the radwaste truck lock area (i.e., dry pipe). However, the LRA drawing LRA-M-218-SH-01-0 shows these areas as out of scope. Please clarify whether these systems are in scope for license renewal and subject to an AMR.

#### **RAI 2.3.3.9-9 Response**

As described in LRA Section 2.3.3.9, the fire protection system is in the scope of license renewal for 10 CFR 54.4(a)(3) because it is credited in the Appendix R safe shutdown analysis (10 CFR 50.48).

The sprinkler subsystem for the radwaste truck loading area does not mitigate fires in areas containing equipment important to safe operation of the plant, nor is it credited with achieving safe shutdown in the event of a fire. This subsystem is designated nonFP-Q on the LRA drawings, indicating that it is only required to meet state, municipal, or insurance requirements. Therefore, this subsystem is not included in the aging management review summarized in LRA Table 3.3.2-9.

However, water-filled components in the fire protection system not covered in LRA Section 2.3.3.9 that could affect safety-related equipment require aging management review per 10 CFR 54.4(a)(2) due to potential spatial interaction. Therefore, this subsystem is subject to aging management review and is addressed in LRA Table 3.3.2-14-12. As indicated in LRA Section 2.1.2.1.3, components subject to aging management review solely due to physical interaction under 10 CFR 54.4(a)(2) are not highlighted on the LRA drawings.

The sprinkler subsystem for the access control area of the radwaste and control building is necessary to meet the Commissions regulations under 10 CFR 50.48, should be designated FP-Q on the LRA drawing, and is subject to aging management review. (A condition report has been issued under the corrective action program to correct the subsystem designation on the drawing.) LRA drawing LRA-M-218-SH-01-0 should have shown that this subsystem is subject to aging management review. Since the components, materials, and environments for this subsystem are the same as those for other subsystems, no changes are required to LRA Tables 2.3.3-9 or 3.3.2-9.

#### **RAI 2.3.3.9-10**

Section 4.8 of the SE discusses floor drains provided in all plant areas protected with fixed water fire suppression. LRA Section 2.3.3.9 states that structural FP components are reviewed in the structural evaluation for the building in which they are contained or in the structural bulk commodities review. However, LRA Tables 2.4-2, 2.4-3, 2.4-4, and 2.4-6 do not list floor drains as a FP component in scope for license renewal or an AMR. Should floor drains be included in scope for license renewal and subject to an AMR? If not, please provide justification for the exclusion.

#### **RAI 2.3.3.9-10 Response**

Water-filled components in the radioactive waste system (which includes the floor drain system) that could affect safety-related equipment require aging management review per 10 CFR 54.4(a)(2) due to potential spatial interaction. These components are subject to aging management review and are addressed in LRA Table 3.3.2-14-23.

## **Section 2.3.3.10 Fire Protection System–Halon**

### **RAI 2.3.3.10-1**

LRA drawing LRA-M-218-SH-04-0 shows a manual pneumatic actuator colored in purple (i.e., in scope). However, the actuator housing is not listed in LRA Table 2.3.3-10. Please clarify whether actuator housings are in scope and subject to an AMR. If not, please justify the exclusion.

### **RAI 2.3.3.10-1 Response**

As stated in LRA section 2.0, the term “piping” in component lists may include pipe, pipe fittings (such as elbows and reducers), flow elements, orifices, and thermowells. If such components have unique tag numbers or the specific component has a function other than pressure boundary, then flow elements, orifices and thermowells are identified as a separate component type.

The housings for the pneumatic actuators on drawing LRA-M-218-SH-04-0 are part of the system pressure boundary and are therefore subject to an aging management review. Since they are small components, without a unique tag number and no function other than pressure boundary, the housings for the pneumatic actuators are included in the “piping” line item in Table 2.3.3-10.

### **RAI 2.3.3.10-2**

Section 4.4 of the SE discusses carbon dioxide as a fixed fire suppression system for the cable spreading room, turbine building tank, and hose reels in the switchgear area, reactor feed pump area, and generator area. SE supplements discuss conversion of the carbon dioxide fixed suppression capability to a Halon fixed suppression capability for the cable spreading room and switchgear area. The status of the other areas (i.e., the turbine building tank and the hose reels in the reactor feed plump and generator areas) is unclear. Please clarify whether fixed suppression exists for these other areas. If there is suppression, please describe the type of suppression provided and explain whether it is in scope and why.

### **RAI 2.3.3.10-2 Response**

Section 4.4 of the SE does not state that the “turbine building tank” has a fixed fire suppression system. It states that the carbon dioxide for fire suppression is stored in a low pressure bulk storage tank located in the turbine building.

There are three fire hoses utilizing liquid CO<sub>2</sub> located in both the 23' and 37' switchgear rooms and turbine deck adjacent to the reactor feedwater pumps. However, these fixed carbon dioxide subsystems are required for insurance purposes but are not required for protection of safety-related systems.

The main turbine generator areas have fire water subsystems for suppression.

The turbine lube oil reservoir pre-action sprinkler subsystem, turbine lube oil storage and ceiling sprinkler subsystems, and turbine lube oil conditioning pre-action water spray subsystem do not



mitigate fires in areas containing equipment important to safe operation of the plant, nor are they credited with achieving safe shutdown in the event of a fire. These subsystems are designated nonFP-Q on the LRA drawings, indicating that they are only required to meet state, municipal, or insurance requirements. Therefore, these subsystems are not included in the aging management review summarized in LRA Table 3.3.2-9.

However, water-filled components in the fire protection system not covered in LRA Section 2.3.3.9 that could affect safety-related equipment require aging management review per 10 CFR 54.4(a)(2) due to potential spatial interaction. Therefore, these subsystems are subject to aging management review and are addressed in LRA Table 3.3.2-14-12. As indicated in LRA Section 2.1.2.1.3, components subject to aging management review solely due to physical interaction under 10 CFR 54.4(a)(2) are not highlighted on the LRA drawings.

#### **RAI 2.3.3.10-3**

Section 4.4 of the SE states that a total flooding Halon extinguishing system will be installed for the computer and storage room, and PNPS FSAR Section 10.8.3.2 discusses automatic Halon suppression for the plant computer room and O&M building record storage vault. However, the LRA drawing LRA-M-218-SH-04-0, does not show the computer and storage room as in scope for license renewal and subject to an AMR. Furthermore, LRA Section 2.3.3-10 states that only passive mechanical components in the cable spreading room Halon system are required for compliance with 10 CFR 50.48 (fire protection regulations). However, please clarify whether these other areas are protected with automatic Halon suppression.

#### **RAI 2.3.3.10-3 Response**

Total flooding, automatically actuated Halon fire suppression systems protect the plant computer room and the O&M building record storage vault. These subsystems do not mitigate fires in areas containing equipment important to safe operation of the plant, nor are they credited with achieving safe shutdown in the event of a fire. These subsystems are only required to meet state, municipal, or insurance requirements. Therefore, these subsystems are not included in the aging management review summarized in LRA Table 3.3.2-10.

**ATTACHMENT C to Letter 2.06.074**

**(3 pages)**

**Response to RAIs on LRA Section 2.5 (Scoping and Screening Results:  
Electrical and Instrumentation and Control Systems)**

## **RAI 1**

1. License renewal application (LRA) Section 2.5 states that the basic philosophy used in the electrical and instrumentation and control (I&C) components in the integrated plant assessment (IPA) was that components are included in the review unless they are specifically screened out. When used with the plant spaces approach, this method eliminates the need for unique identification of every component and its specific location. Also, it states that during the IPA, commodity groups and specific plant systems were eliminated from further review as the intended functions of commodity groups were examined. (1) Identify all the components that were screened out and provide a basis used for doing so. (2) Were all plant spaces evaluated under this methodology? If any spaces were excluded from evaluation, identify those spaces that were excluded and provide the reason why each space was excluded. (3) Identify commodity groups and specific plant systems that were eliminated from further review and provide a basis used for doing so.

## **Response to RAI 1**

- (1) The following passive, long-lived components within the cable and connection commodity group were determined to fulfill no license renewal intended functions.

### **Source range monitor cables**

Source range monitors are nonsafety-related components that provide neutron flux information during reactor startup and low flux level operations. Failure of the source range monitors cannot prevent satisfactory accomplishment of a safety function and the monitors are not relied on to perform a function that demonstrates compliance with regulations for any of the regulated events.

### **Area radiation monitor cables (excluding high-range radiation monitors)**

High-range area monitors are EQ and are replaced based on a qualified life. Other area radiation monitors are nonsafety-related components that provide information to warn of abnormal gamma radiation levels in areas where radioactive material may be handled. Failure of these area radiation monitors cannot prevent satisfactory accomplishment of a safety function and these monitors are not relied on to perform a function that demonstrates compliance with regulations for any of the regulated events.

- (2) Electrical scoping and screening was based on a bounding approach that included all plant systems, irrespective of the spaces in which they are located. All plant commodity groups were evaluated under this method. The spaces approach is associated with the aging management review, not with screening. Spaces were not considered in screening.

- (3) Two commodity groups were eliminated from further review. They are transmission conductors and uninsulated ground conductors.

Transmission conductors are uninsulated, stranded electrical cables used in outside buildings in high voltage applications.

A review of the PNPS UFSAR did not identify a license renewal intended function for transmission conductors. Transmission conductors do not meet the scoping criteria in 10 CFR 54.4. These components are not safety-related per 10 CFR 54.4(a)(1) and their failure cannot prevent satisfactory accomplishment of a safety function identified in 10 CFR 54.4(a)(1). Transmission conductors are not credited for mitigation of regulated events listed in 10 CFR 54.4(a)(3). Transmission conductors are subject to aging management review if they part of the plant systems portion of the offsite power system necessary for recovery of offsite power following an SBO as specified in ISG-2. However, PNPS does not utilize transmission conductors in the plant systems portion of the circuits for recovery of offsite power following SBO.

Uninsulated ground conductors (e.g., copper and aluminum cable, copper bar, and steel bar) make ground connections for electrical equipment. These uninsulated ground conductors connect to electrical equipment housings and electrical enclosures as well as metal structural features such as the cable tray system and building structural steel.

A review of the PNPS UFSAR did not identify a safety function or intended function for license renewal for uninsulated ground conductors. Uninsulated ground conductors enhance the capability of the electrical system to withstand disturbances (e.g., electrical faults, lightning surges) for equipment and personnel protection. Uninsulated ground conductors do not meet the scoping criteria in 10 CFR 54.4. These components are not safety-related per 10 CFR 54.4(a)(1) and are not credited for mitigation of regulated events listed in 10 CFR 54.4(a)(3). Industry and plant-specific OE for uninsulated ground conductors does not indicate credible failure modes that could prevent satisfactory accomplishment of a safety function identified in 10 CFR 54.4(a)(1).

## **RAI 2**

2. LRA Section 2.5 states that fuse holders with metallic clamps are either part of a complex active assembly or part of circuits that perform no license renewal intended function. Where as in Table 2.5-1, fuse holder insulation material is identified as electrical and I&C components subject to aging management review (AMR). Confirm that Pilgrim Nuclear Power Station does not use fuse holders (with metallic clamps or bolted connection type) that are not part of a larger assembly, but support safety-related and non safety-related functions in which the failure of a fuse precludes a safety function from being accomplished [10 CFR 54.4(a)(1) and (a)(2)] and revise Table 2.5-1 accordingly.

## **Response to RAI 2**

PNPS cables and connections commodity group includes fuse holders. Fuse holders are electrical connections (similar to terminal blocks) requiring aging management review.

The Interim Staff Guidance (ISG-5) on the Identification and Treatment of Electrical Fuse Holders for License Renewal (March 10, 2003) was issued due to NRC Staff concerns regarding fuse holders that use metallic clamps to secure the fuses. Consistent with this guidance, fuse holders inside enclosures of active components, such as switchgear, power supplies, power inverters, battery chargers, and circuit boards, are piece parts of the larger active assembly, and are not subject to aging management review.

Evaluations of fuse holders at PNPS indicated that the fuse holders utilizing metallic clamps or bolted connections are either part of an active component or located in circuits that perform no license renewal intended function. Therefore, fuse holders with metallic clamps at PNPS are not subject to aging management review.

## **RAI 3**

3. LRA Section 2.5 states that electrical cables and connections subject to 10 CFR 50.49 environmental qualification (EQ) requirements are not subject to AMR since the components are replaced based on qualified life. Confirm that all electrical cables and connections subject to 10 CFR 50.49 EQ requirements are replaced based on qualified life (current licensing basis is 40 years).

## **Response to RAI 3**

All electrical cables and connections subject to 10 CFR 50.49 EQ requirements are replaced based on qualified life.

**ATTACHMENT D to Letter 2.06.074**  
**(15 pages)**

**Changes to LRA Appendix E (Environmental Report)**  
**Section 2.6.2 (Minority and Low-Income Populations)**

## Minority and Low-Income Populations

### 2.6.2.1 Background

The NRC performs environmental justice analyses utilizing a 50-mile radius around the plant as the environmental impact site and the state as the geographic area for comparative analysis. Entergy has adopted this approach for identifying the minority and low-income populations that could be affected by PNPS operations.

Entergy used ArcView<sup>®</sup> geographic information system software to combine U.S. Census Bureau (USCB) TIGER line data with USCB 2000 census data to determine minority and low-income characteristics (at the block-group level) within the 50-mile radius environmental impact site. Entergy included all block groups if any of their area lay within 50 miles of PNPS. The 50-mile radius includes 3,863 block groups. Entergy defines the geographic area for PNPS as a two-state area, with the largest portion of that area (89%) located in Massachusetts and a smaller portion (11%) in Rhode Island.

### 2.6.2.2 Minority Populations

The NRC procedural guidance for performing environmental assessments and considering environmental issues defines a "minority" population as the racial categories: American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, Black races, other races, more than 2 races, and the aggregate of all minority races.

Hispanic ethnicity is also defined as a minority population category [Reference 2-33]. Hispanic ethnicity is not defined by the USCB as a racial category and, therefore, it is possible to have both white Hispanics and non-white Hispanics (e.g. Black Hispanic, Asian Hispanic). For the purposes of aggregation, a minority population that combines both minority races and Hispanic ethnicity can be defined as all non-white or multiple races plus white Hispanics. As a note, all non-white Hispanics are already counted in the non-white racial minority categories.

NRC guidance indicates that a minority population exists if either of the two following conditions exists:

*Exceeds 50 Percent* - the minority population of the environmental impact site exceeds 50 percent, or

*More than 20 Percentage Points Greater* - the minority population percentage of the environmental impact site is significantly greater (typically at least 20 percentage points) than the minority population percentage in the geographic area chosen for comparative analysis.

NRC guidance calls for use of the most recent USCB decennial census data. Entergy used 2000 census data [References 2-43 and 2-44] to determine the percentage of the total population in the two states that belong to each minority category (Table 2-3a). This information was then used to calculate minimum thresholds for each minority category. Because no block

groups in the 50-mile radius environmental impact site exceeded the 50% minority population criterion above, the "more than 20% greater" criterion was used to establish minority population thresholds (Table 2-3a). Any block group with a minority category percentage that exceeded any of the minimum threshold listed in Table 2-3a was defined as a "minority population."

For each minority category, Entergy divided USCB minority population numbers for each block group by the total population within that block group to obtain the percent of the block group's population that belonged to each minority category. For each of the 3,863 block groups within 50 miles of PNPS, Entergy calculated the percent of the population in each minority category and compared the result to the corresponding geographic area's minority threshold percentages to determine if a minority population exists. The number of block groups that exceeded minority thresholds is summarized in Tables 2-3b and 2-3c. The location of each minority population within 50 miles of PNPS is shown in Figures 2-13 through 2-19 and Figure 2-22.

Based on the "more than 20 percent" criterion, a Native Hawaiian or other Pacific Islander minority population exists in one block group in Suffolk County, Massachusetts. Black minority populations exist in 261 block groups, with 233 of the block groups in Massachusetts and 28 in Rhode Island. Other minority race populations exist in 135 block groups, with 77 occurring in Massachusetts and 58 are in Rhode Island. No block groups exceeded the minimum threshold for more than 2 races. Aggregate of minority racial populations exist in 595 block groups, with 477 of the block groups occurring in Massachusetts and 120 in Rhode Island.

Minority populations based on Hispanic ethnicity occur in 240 block groups, with 145 of them in Massachusetts and 95 in Rhode Island. Minority populations composed of the aggregate of minority races and Hispanic ethnicity populations exist in 651 block groups, with 514 of the block groups occurring in Massachusetts and 137 in Rhode Island. The location of these minority populations is shown in Figure 2-22.

Overall, no minority populations were identified within a 6-mile radius of PNPS. The nearest minority population within a 50-mile radius was in west-central Plymouth County near the community of Brockton where several minority thresholds were exceeded. These populations are approximately 25 miles west of the PNPS site. Other minority populations within 50 miles of PNPS were typically clustered in or near the Boston, Massachusetts and Providence, Rhode Island areas.

#### **2.6.2.3      Low-Income Populations**

NRC guidance defines "low-income" by using USCB statistical poverty thresholds for the year 1999 [Reference 2-33, Appendix D]. Low-income populations within the 50-mile radius of PNPS were identified using information on both the number of individuals and number of households below the poverty level in Massachusetts and Rhode Island and block groups within the environmental impact site (50-mile radius). The USCB values for the number of individuals and households below the poverty level in Massachusetts was 9.3% and 9.8%, respectively (Table 2-3a). The number of individuals and households below the poverty level in Rhode Island was 11.9% and 12.4%, respectively.



A low-income population is considered to be present if:

- (1) the low-income population of the block group or environmental impact site exceeds 50%, or
- (2) the percentage of households below the poverty level in a block group is significantly greater (typically at least 20 points) than the low-income population percentage in the geographic area chosen for comparative analysis.

Because no block groups had more than 50% of its individuals or households below the poverty level, the "greater than 20%" criterion was used to identify low-income populations within the 50-mile radius environmental impact site (Table 2-3a). The number and percentage of block groups that exceeded these thresholds are included in Tables 2-3b and 2-3c. The locations of the low-income populations with the 50-mile radius area are shown in Figures 2-20 and 2-21.

Based on the "more than 20 percent" criterion, low-income "individual" populations exist in 190 block groups in Massachusetts and 79 in Rhode Island. Low-income populations based on the number of "households" exist in 179 block groups in Massachusetts and 74 block groups in Rhode Island.

Overall, no low-income populations were identified within a 6-mile radius of PNPS. The nearest low-income population occurring within a 50-mile radius was in northwest Plymouth County near the community of Brockton where thresholds for both low-income individuals and households were exceeded. These populations are approximately 25 miles northwest of the PNPS site. Other low-income populations within 50 miles of PNPS were clustered near Boston and in Bristol County near the communities of Fall River and New Bedford, Massachusetts and in Providence County Rhode Island.

**Table 2-3a Average percentage of minority and low-income individuals in the MA and RI geographic areas and threshold criteria for identifying minority and low-income populations at the block group level**

State	American Indian Alaska Native	Asian	Native Hawaiian Or Other Pacific Islander	Black Races	Other races	More than 2 races	Aggregate of minority races	Hispanic Ethnicity	Aggregate of minority races & Hispanic ethnicity	Low-income Population (Individuals)	Low-income Population (Households)
MA	0.2	3.8	0.0	5.4	3.7	2.3	15.5	6.8	18.1	9.3	9.8
RI	0.5	2.3	0.1	4.5	5.0	2.7	15.0	8.7	18.1	11.9	12.4
Minority and low-income population threshold criteria											
MA	20.2	23.8	20.0	25.4	23.7	22.3	35.5	26.8	38.1	29.3	29.8
RI	20.5	22.3	20.1	24.5	25.0	22.7	35.0	28.7	38.1	31.9	32.4

**Table 2-3b Number of block groups that exceed thresholds for minority and low-income populations for the 15 counties located within a 50-mile radius of PNPS**

State	County	Number of Block Groups within 50 mile radius	American Indian Alaska Native	Asian	Native Hawaiian Or Other Pacific Islander	Black Races	Other races	More than 2 races	Aggregate of minority races	Hispanic Ethnicity	Aggregate of minority races & Hispanic ethnicity	Low-Income Population (Individuals)	Low-Income Population (Households)
MA	Barnstable	198	0	0	0	0	0	0	0	0	0	1	0
MA	Bristol	417	0	1	0	0	11	0	22	6	26	34	34
MA	Dukes	20	1	0	0	0	0	0	1	0	1	0	0
MA	Essex	317	0	0	0	1	5	0	33	25	36	12	10
MA	Middlesex	761	0	11	0	14	2	0	52	8	67	9	7
MA	Nantucket	4	0	0	0	0	0	0	0	0	0	0	0
MA	Norfolk	473	0	14	0	5	0	0	20	0	18	3	2
MA	Plymouth	366	0	0	0	17	8	0	43	0	45	11	11
MA	Suffolk	630	0	28	1	196	51	0	304	106	321	120	115
MA	Worcester	18	0	0	0	0	0	0	0	0	0	0	0
RI	Bristol	41	0	0	0	0	0	0	0	0	0	0	0
RI	Kent	83	0	0	0	0	0	0	0	0	0	1	0
RI	Newport	60	0	0	0	1	0	0	2	0	2	1	1
RI	Providence	471	0	3	0	27	58	0	118	95	135	77	73
RI	Washington	4	0	0	0	0	0	0	0	0	0	0	0
Total		3863	1	57	1	261	135	0	595	595	651	269	253
Minority and low-income thresholds													
MA		3204	20.2	23.8	20.0	25.4	23.7	22.3	35.5	35.5	38.1	29.3	29.8
RI		659	20.5	22.3	20.1	24.5	25.0	22.7	35.0	35.0	38.1	31.9	32.4

**Table 2-3c Number and percentage of census block groups within a 50-mile radius of PNPS that exceed thresholds for minority and low-income populations**

Minority and Low-Income Categories	MA Threshold (%)	Number Block Groups that Exceed State Threshold	Percentage of Block Groups that Exceed State Threshold
American Indian & Alaskan Native	20.2	1	0.0
Asian	23.8	54	1.7
Native Hawaiian or other Pacific Islander	20.0	1	0.0
Black Races	25.4	223	6.9
Other Races	23.7	77	2.4
More than two races	22.3	0	0.0
Aggregate of minority races	35.4	477	14.8
Hispanic Ethnicity	26.8	145	4.5
Aggregate of minority races and Hispanic Ethnicity	38.1	514	16.0
Low Income – Population	29.3	190	5.9
Low Income – Households	29.8	179	5.6
	RI Threshold (%)	Number Block Groups that Exceed State Threshold	Percentage of Block Groups that Exceed State Threshold
American Indian & Alaskan Native	20.5	0	0.0
Asian	22.3	3	0.5
Native Hawaiian or other Pacific Islander	20.1	0	0.0
Black Races	24.5	28	4.2
Other Races	25.0	58	8.8
More than two races	22.7	0	0.0
Aggregate of minority races	35.1	120	18.2
Hispanic Ethnicity	28.7	95	14.4
Aggregate of minority races and Hispanic Ethnicity	38.1	137	20.8
Low Income – Population	31.9	79	12.0
Low Income – Households	32.4	74	11.2

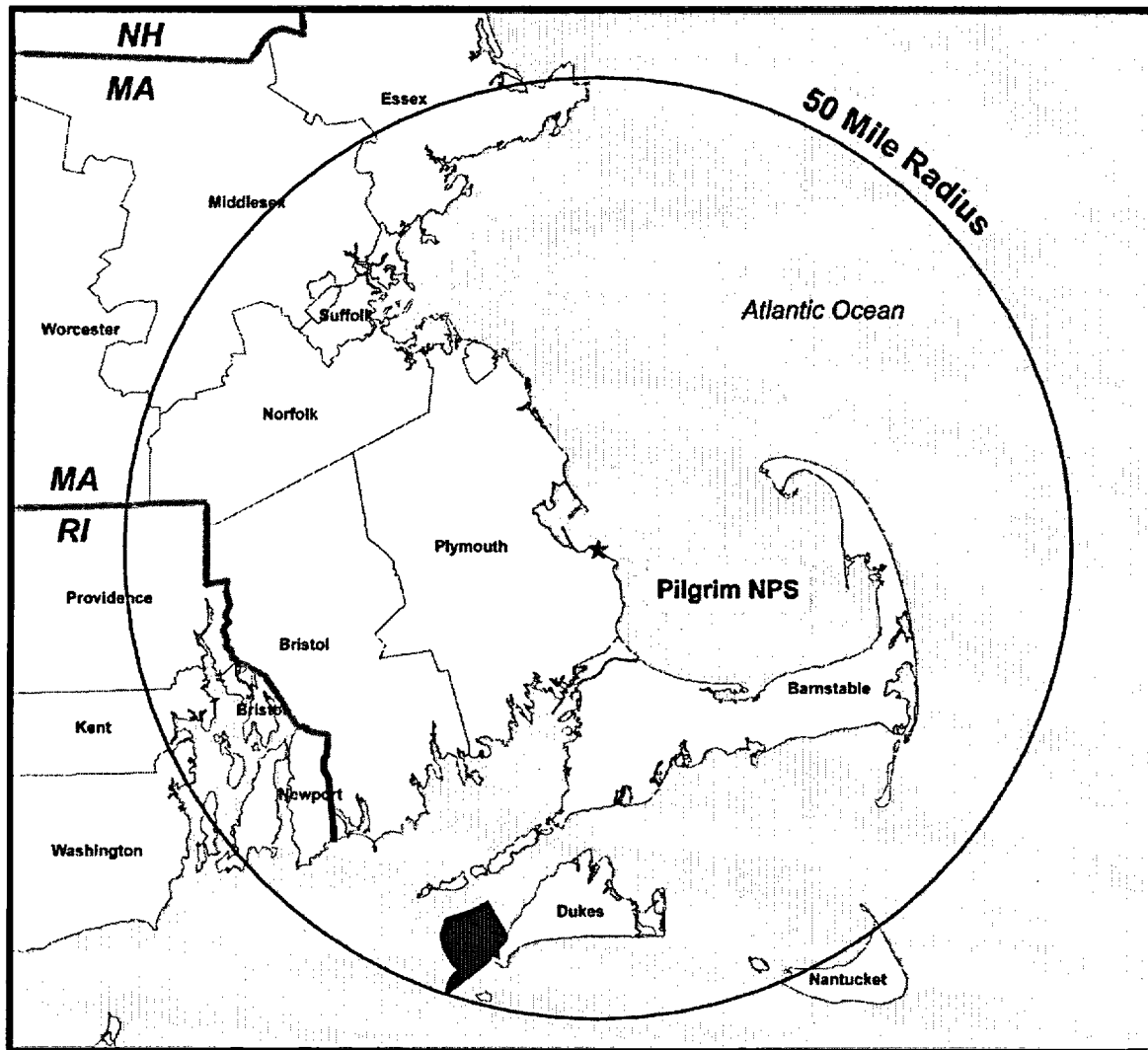


Figure 2-13  
American Indian or Alaskan Native Minority Population Map

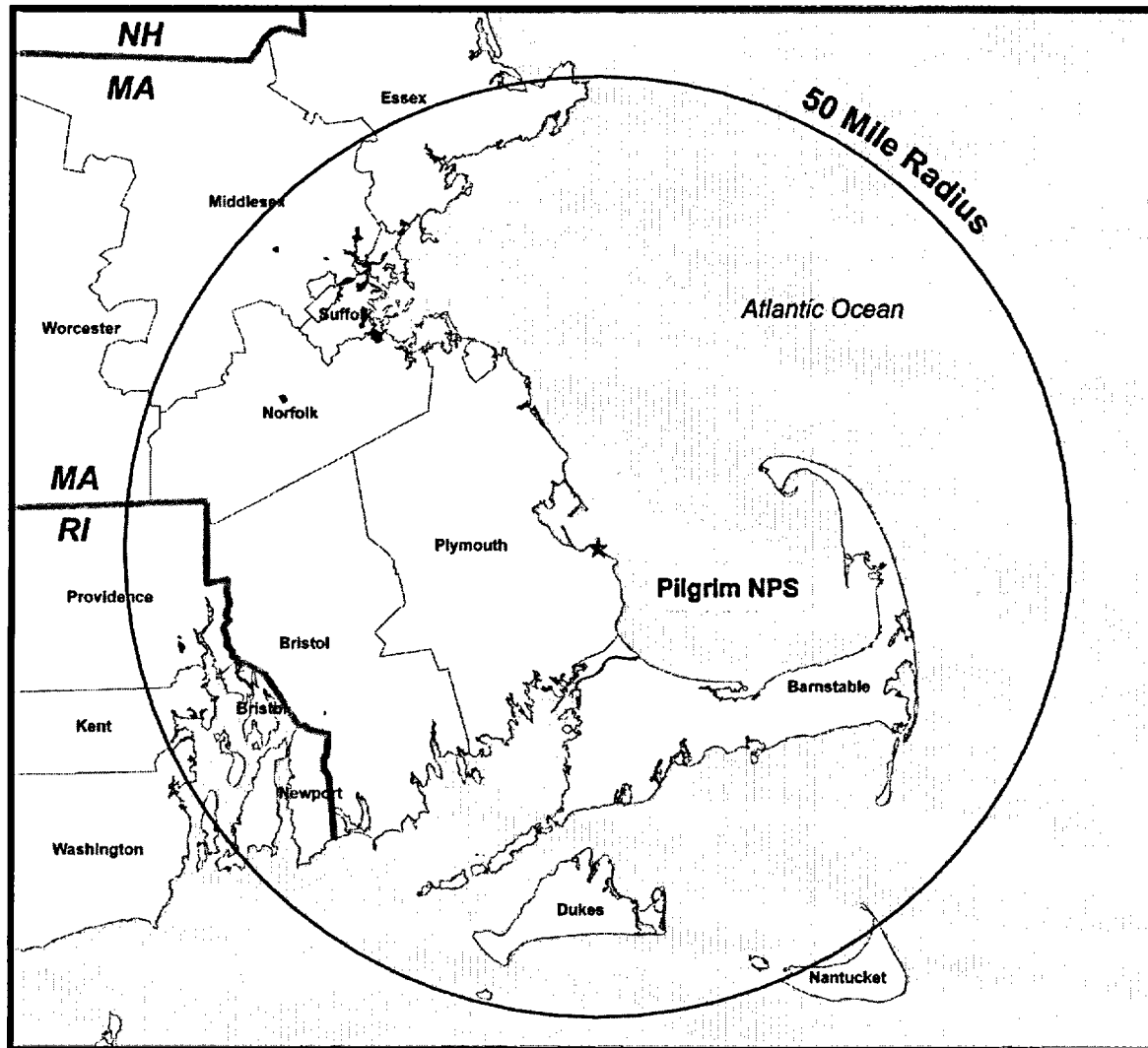


Figure 2-14  
Asian or Pacific Islander Minority Population Map

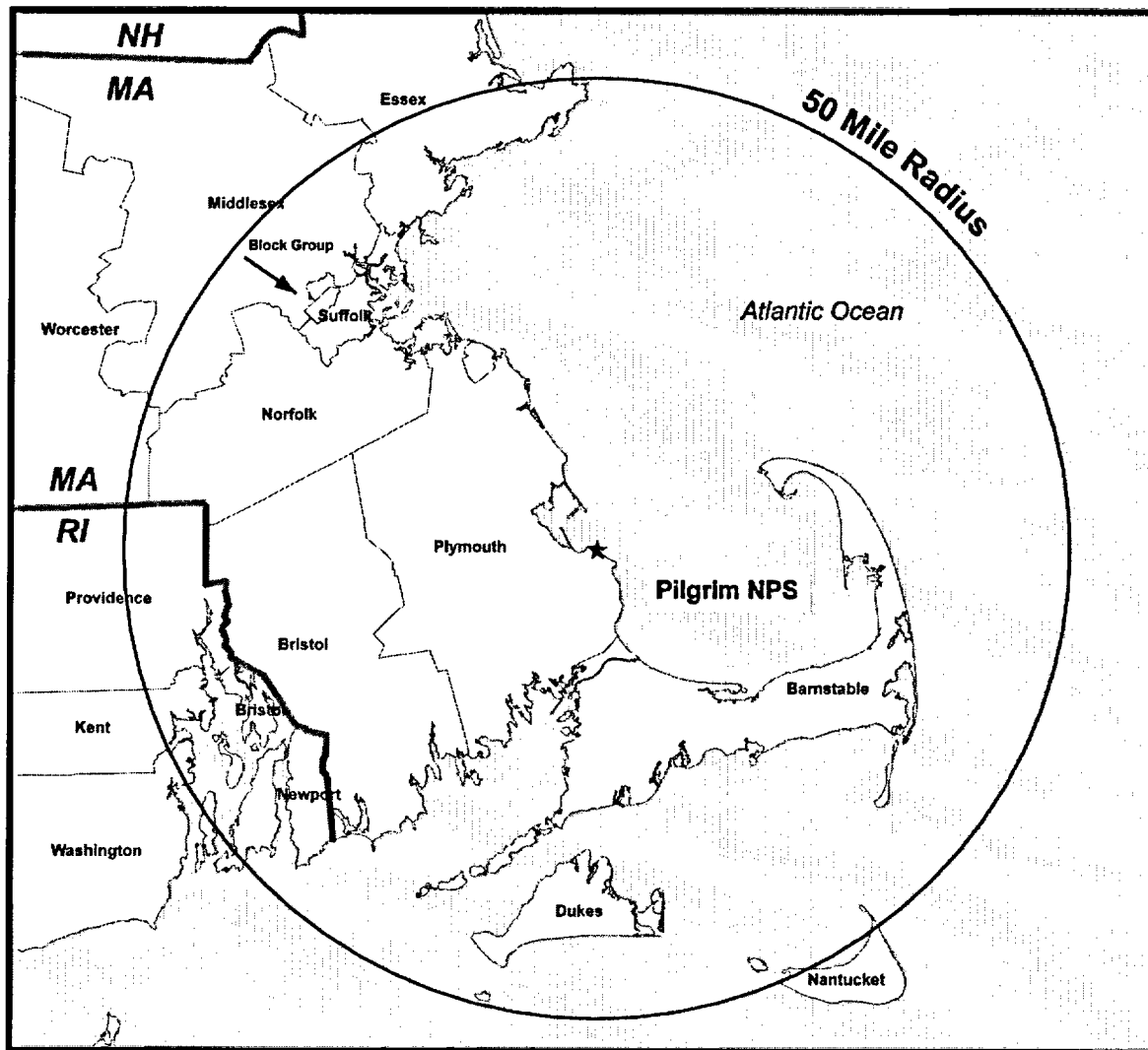


Figure 2-15  
Native Hawaiian or Other Pacific Islander Minority Population Map