



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

**Stephen J. Bethay**  
Director, Nuclear Assessment

March 20, 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

Follow-Up Response to NRC Generic Letter 2003-01

- REFERENCE**
1. Entergy Letter No. 2.04.086, "NRC Generic Letter 2003-01 Control Room Habitability Initial Summary Actions Report," dated September 30, 2004
  2. NRC Generic Letter 2003-01 "Control Room Habitability," dated June 12, 2003

**LETTER NO.** 2.06.019

Dear Sir or Madam:

This letter provides Entergy's follow-up response to Generic Letter 2003-01 for Pilgrim Station (Pilgrim Station). By Reference 1, Entergy provided the initial response to Reference 2 for Pilgrim Station. In this response, Pilgrim Station committed to perform certain actions to determine if Control Room Habitability is maintained within the current licensing and design basis. The results of that review are included within this letter.

This letter does not contain any commitments.

If you have any questions on this transmittal, please contact Mr. Bryan Ford, Licensing Manager at 508-830-8403.

Sincerely,

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

Stephen J. Bethay  
Director, Nuclear Assessment

MJG/dm

Attachment: Follow-up Response to Generic Letter 2003-01

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Pilgrim Nuclear Power Station

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cc: Mr. James Shea, Project Manager  
Office of Nuclear Reactor Regulation  
Mail Stop: 0-8B-1  
U.S. Nuclear Regulatory Commission  
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Rockville, MD 20852

Senior Resident Inspector  
Pilgrim Nuclear Power Station

**Attachment 1**

**Follow-up Response to Generic Letter 2003-01**

## **Background**

On June 12, 2003, the NRC issued Generic Letter 2003-01, "Control Room Habitability" (Reference 2). The GL requested licensees provide confirmation that: 1) the control room meets the applicable habitability regulatory requirements (e.g. GDC 1, 2, 4, 5, and 19); and 2) the Control Room Habitability Systems (CRHS) are designed, constructed, configured, operated and maintained in accordance with the design and licensing basis.

## **CRE Inleakage Testing**

Reference 2 requested that Pilgrim Station confirm that the most limiting inleakage into the Control Room Envelope (CRE) is less than the values assumed for the design basis analysis. Reference 2 refers to ASTM E741-00, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution," as an example of an acceptable test methodology.

Entergy contracted NCS Corporation (NCS) and Lagus Applied Technologies (LAT) to perform CRE inleakage testing at Pilgrim Station. The testing was performed in accordance with NCS/LAT Procedure 1204A, Revision 5, "Constant Injection Tracer Ventilation Test," which is based on the ASTM E741-00 methodology. The testing was performed in December 2005.

## **Test Configurations**

For the purposes of air inleakage testing the CRE consisted of the Main Control Room (MCR) and the associated Control Room High Efficiency Air Filtration System (CRHEAFS) air handling units and ductwork. The CRHEAFS is designed to filter intake air for the MCR during conditions where normal intake air may be contaminated. The filtration system consists of two 1,000 cfm high efficiency filter trains. Each train consists of a multistage filtration/heater unit, a high efficiency particulate air (HEPA) filter, a charcoal filter and a final HEPA Filter. For reliability each filter train has its own supply fan. Air inleakage was calculated separately for each of the two CHREAFS supply trains (Train A and Train B).

## **Test Methods**

Testing was performed with the system aligned as described above using NCS/LAT Procedure 1204A, Revision 5, "Constant Injection Tracer Ventilation Test," which is based on the ASTM E741-00 methodology. Sulfur Hexafluoride (SF<sub>6</sub>) was used as the tracer gas. In all the tests, the SF<sub>6</sub> concentrations were determined using gas chromatographs optimized for detection of SF<sub>6</sub>.

Calibration of the two AUTOTRAC™ Automated Gas Chromatographs using certified calibration standards was performed daily prior to initiation of each test to ensure that instrument drift and sensitivity variations would be minimized.

Makeup flow rates from the filter unit were measured by a tracer gas dilution technique using NCS/LAT procedures. Measurement of the makeup flow rate allows calculation of the amount of air inleakage into the CRE that is not provided by makeup flow (by differencing Total Air Inflow and Makeup flow). This procedure is based on the methodology described in ASTM Standard E2029-99, "Standard Test Method for Volumetric and Mass Flow Rate Measurement using Tracer Gas Dilution."

All internal doors were propped open and a number of ceiling tiles were removed from the suspended style/type ceiling; mixing fans and blower fan/flex duct systems were used to ensure uniform mixing of the tracer gas within the test volume.

Each train's test was performed similarly using a concentration buildup/steady state tracer gas test method in accordance with NCS/LAT Procedure 1204A, Rev. 5, "Constant Injection Tracer Ventilation Test." The tracer gas was continually injected into the makeup air stream at a constant rate and was dispersed throughout the CRE.

After allowing a sufficient period of time for concentration equilibrium to occur, in accordance with ASTM E741-00 requirements, tracer gas samples from various locations within the CRE were obtained for analysis. During the actual testing in the various pressurization modes, a non-negligible background of tracer gas was measured in the Mechanical Equipment Room (MER), most likely due to supply duct outleakage.

## Results

The following tabulates the results of the above testing and associated acceptance criteria:

Test	System Mode	Train in Service	Outside Air Makeup flow (SCFM)	Existing Design Basis Assumption for Maximum CRE Inleakage (SCFM)	Measured Test Total CRE Inleakage (SCFM) Corrected*
1	Pressurization	A	927 ± 31	10	75**
2	Pressurization	B	939 ± 31	10	121 ± 26

\* Corrected for background concentration of SF<sub>6</sub> in the MER.

\*\* Note that per Regulatory Guide 1.197 Section C.1.4, inleakage rates less than 100 CFM do not require uncertainty.

The results of the two tests while in the pressurization mode indicate that the unfiltered inleakage into the CRE was greater than the currently assumed unfiltered inleakage of 10 SCFM.

## Operability of the Control Room Envelope

The Control Room HVAC system and the CRHEAFS ensure the MCR is habitable for continuous occupancy by personnel and equipment during normal and design bases accident conditions, respectively.

An operability evaluation of the radiological consequences to control room occupants following a postulated LOCA was developed based on the use of the Alternate Source Term (AST) methodology in lieu of the current licensing basis methodology described in TID-14844, "Calculation of Distance Factors for Power and Test Reactors. However, the dose acceptance criteria for the operability evaluation corresponded to those in the current licensing basis of Pilgrim Station, mainly the 10 CFR 50 Appendix A GDC-19 limit of 5 rem to the whole body, or its equivalent to any part of the body for the duration of the accident. The operability evaluation concluded that the dose limits prescribed in GDC-19 are satisfied under worst case post accident conditions with unfiltered inleakage rates up to 1500 SCFM. As indicated above, the measured inleakage rates using tracer gas testing methodology were well below the value calculated in the operability evaluation. Thus, the Pilgrim Station CRE remains operable and no compensatory actions are required.

Pilgrim Station received License Amendment 215 (TAC No. MC2705) for limited scope application of the Alternate Source Term (AST) relative to fuel handling accident dose consequences. Entergy plans on submitting an additional license amendment request to revise the licensing basis to adopt the remaining scope of AST applicability that would allow CRE inleakage greater than the current licensing basis. Submittal of this request is currently scheduled for 1<sup>st</sup> quarter 2007 with any potential modifications to support the analysis being performed in the 2009 Refueling Outage. This item will be tracked by the corrective action process.