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October 28, 2010

Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Reference: 1) Docket No. 70-143; SNM License 124
2) Letter from Mark P. Elliott to NRC, dated July 19, 2010 (21G-10-0135), Request for License Amendment to Chapter 3 Regarding Radiation Protection
3) Letter from NRC to Mark P. Elliott, dated September 28, 2010 (TAC No. L33008), Request for Additional Information Concerning Changes to Chapter 3 Regarding Ventilation Requirements

**Subject: Response to Request for Additional Information Concerning Changes to Chapter 3 Regarding Ventilation Requirements**

Nuclear Fuel Services, Inc. (NFS) hereby submits the attached response to the September 28, 2010, request for additional information (Reference 3) regarding proposed changes to Chapter 3 of SNM License 124, submitted in Reference 2.

NFS would appreciate your prompt attention to this matter. If you or your staff have any questions, require additional information, or wish to discuss this, please contact me, or Mr. Rik Droke, Senior Regulatory Advisor, at (423) 743-1741. Please reference our unique document identification number (21G-10-0200) in any correspondence concerning this letter.

Sincerely,

**NUCLEAR FUEL SERVICES, INC.**

Mark P. Elliott, Director
Quality, Safety, and Safeguards

DML/pdj
Attachment: Response to RAI



NMSS01

Copy:

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**Attachment**
**Response to RAI**

**5 pages to follow**

## Response to RAI

**RAI 1**

NFS personnel have indicated that they could identify little applicable guidance for the design of the ventilation system except for ANSI/AIHA Z9.5-2003, "Laboratory Ventilation." However, NRC staff identified several potential sources of applicable guidance-including ASME AG-1-2003 "Code on Nuclear Air and Gas Treatment"; AGS-G007-2007 " Guideline for Gloveboxes"; DOE-HDBK-1169-2003 "DOE Nuclear Air Cleaning Handbook"; and, ACGIH 2095 "Industrial Ventilation: A Manual of Recommended Practice for Design." Please justify the use of ANSI/AIHA Z9.5-2003 as being applicable for process gloveboxes and open process enclosures as opposed to operations in a laboratory setting. Also justify why ANSI/AIHA Z9.5-2003, which states it does not apply to radioisotope laboratories, would be considered acceptable guidance for ventilation design in a facility where uranium materials are the primary consideration.

**NFS Response:**

ANSI/AIHA Z9.5-2003 was chosen as the guidance that would be followed for general design requirements of ventilation and containment systems. Section 1.1 of the standard does state that it is not applicable to radioisotope laboratories, "except as it relates to general laboratory ventilation." The standard goes on to give detailed guidance for such components as containment face velocity, directional air flow, and filtration based on hazard categories. Specifically, the standard states a face velocity of 80-100 linear fpm will provide adequate protection for a majority of applications. Furthermore, DOE-HDBK-1169-2003, Table 2.8, also recommends this same face velocity for operations with highly hazardous (including radioactive) materials. The handbook goes on to refer the reader to ANSI/AIHA Z9.5-2003 for additional guidance.

Based on the Integrated Safety Analysis for NFS, the primary hazard in the laboratory areas is chemical. There are no IROFS for radiological materials in these laboratory areas.

Therefore, ANSI/AIHA Z9.5-2003 is an applicable guidance document for designing ventilation processes in the laboratory areas at NFS. For process areas, where radioisotopes may be the primary hazard, the DOE-HDBK-1169-2003 recommendations may be more appropriate. In consideration of these facts, NFS decided to differentiate the license requirements for laboratory areas and process areas.

The following underlined modifications will be made to Section 3.2.2.2.1.1, Process Area Containment Enclosures, and Section 3.2.2.2.1.2, Laboratory Area Containment Enclosures:

### Section 3.2.2.2.1.1 Process Area Containment Enclosures

The design criteria for inward air flow through the open face of a containment enclosure in a process area, used to handle radioactive material which has a propensity to suspend in air, shall be at least 125 (+/- 25) linear feet per minute (LFM). For operations, the inward air flow through the open face of containment enclosures, used to process radioactive material which has a propensity to suspend in air, shall be at least 100 (+/-20) LFM. Openings used to transfer containerized material or equipment are excluded.

Air flow measurement checks will be performed at least monthly on containment enclosures to ensure compliance with these requirements. In addition, air flow measurements will be performed after significant modifications or changes to the ventilation system to ensure compliance.

Devices are provided to measure the differential pressure within a containment enclosure with respect to the outside atmosphere, except in containment enclosures where the nature of an operation makes this requirement impractical for processing purposes.

Minimum differential pressure control levels are 0.5 inches water negative for high-enriched uranium, and 0.25 inches water negative for low-enriched uranium systems. These differential pressures will be checked when used to ensure compliance with these requirements.

Inert atmosphere or positive pressure boxes will be maintained at pressures not to exceed 1.0 inch of water positive. These enclosures will also be provided with over-pressurization protection. Process air (air inside a containment enclosure) that is routinely discharged to the room air will be HEPA filtered and sampled via the airborne radioactivity monitoring program.

### Section 3.2.2.2.1.2 Laboratory Area Containment Enclosures

The design criteria for inward air flow through the open face of a containment enclosure in laboratory areas, used to handle radioactive material which has a propensity to suspend in air, shall be in accordance with ANSI/AIHA Z9.5-2003 recommendations. NFS will determine the total air flow for each type of containment enclosure to ensure proper installation and function. The total flow will then be correlated to a proper average face velocity for the containment enclosure.

Any ventilated containment with an open door or port through which uncontainerized radioactive material is routinely handled is subject to these requirements (however, the intermittent opening of a door, glove port, etc. for the

sole purpose of adding or removing containerized material or equipment does not constitute handling radioactive material with a propensity to suspend in air). In addition, any ventilated containment with an opening to the room which is high efficiency particulate air (HEPA) filtered, is excluded.

**RAI 2**

Please verify that the ventilation system and high efficiency particulate air filters are not identified as items relied on for safety (IROFS). If these are IROFS, please identify the management measures that assure the function and reliability of the IROFS. Management measures may be satisfied by committing to be consistent with standards such as ASME AG-1 for design and operation of ventilation and filtration equipment that support licensed operations involving special nuclear material.

**NFS Response:**

Based on the Integrated Safety Analysis for NFS, the ventilation system and high efficiency particulate air filters are NOT identified as items relied on for safety (IROFS) for radiological hazards.

**RAI 3**

Justify why the design guidance found in AGS-G007-2007, DOE-HDBK-1169-2003, and ASME AG-1-2003 for nuclear gloveboxes (i.e., ventilation designed such that air flow through a breach in a normally sealed enclosure would be 125 +/- 25 lfm) is not applicable for NFS' gloveboxes.

**NFS Response:**

NFS has decided to differentiate requirements for the design and operation of containment enclosures in laboratory areas from those in process areas. For those enclosures located in process areas, a designed air flow of 125 +/- 25 linear fpm and an operational air flow of 100 +/- 20 linear fpm will be used. These changes will be added to the current license application, in Section 3.2.2.2.1.1, Process Area Containment Enclosures. Refer to the RAI 1 Response for the proposed Section 3.2.2.2.1.1 modification.

**RAI 4**

In Section 3.2.2.1, first paragraph, please clarify what is meant by "measurement checks" in order to remove ambiguity regarding exactly what measurements will be performed.

**NFS Response:**

In the last sentence of the first bullet in Section 3.2.2.1, the phrase "measurement checks" will be replaced with the following:

> "Face velocity measurements at the openings between occupied areas will be performed..."

**RAI 5**

In Section 3.2.2.2.2, last sentence, please clarify the statement, "these pressures are checked when used" in order to remove ambiguity regarding "when used."

**NFS Response:**

The last statement in Section 3.2.2.2.2 will be changed to read:

> "These pressures are checked by personnel prior to each use."

**RAI 6**

In Section 3.2.2.2.2, a statement is made that implies the same design requirements established for high-enriched uranium will be used for plutonium operations. Please verify that only uranium (i.e., no plutonium) operations will be performed under this license.

**NFS Response:**

The only references to plutonium in the current application are found in Sections 3.2.2.2.1 and Table 3.3. In Section 3.2.2.2.1, NFS implies that the same differential pressure control level will be used for U-233, plutonium, and HEU. NFS will remove this reference as there is no intention of authorizing plutonium operations under this license. NFS has chosen to leave the reference to surface contamination survey frequencies in Table 3.3 to facilitate the contamination control program during planned decommissioning of the plutonium-contaminated wet cell at the former site of Building 234.

**RAI 7**

In Section 3.2.2.2.2, it is stated that the minimum flow rates will be established by internal procedures. ANSI Z9.5-2003 provides a range of possible capture velocity flow rates depending on the hazard level. The only other commitment in the design of enclosure ventilation is the differential pressures established in this section. Please provide additional clarification as to what design criteria for capture velocity will be utilized.

**NFS Response:**

The minimum flow rate into containment enclosures will be based on recommendations in ANSI/AIHA Z9.5-2003 and DOE-HDBK-1169-2003, and will be included in the respective sections for laboratory operations and gloveboxes for processing areas. Refer to the RAI 1 response for the proposed modifications to the license sections.