

Request for Additional Information
Regarding the Application for License Renewal
from Nuclear Fuel Services, Inc.
dated June 30, 2009

1. General Information

- 1.1. The existing license excludes authority to possess uranium in pyrophoric forms. The application removes this restriction. Explain the basis for this change and why the U.S. Nuclear Regulatory Commission (NRC) should find that Nuclear Fuel Services, Inc. (NFS) can handle pyrophoric forms of uranium safely.

This information is required to verify compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) 70.22 which requires, in part, that each application contain information on the activity for which the special nuclear material (SNM) is requested, the equipment and facilities which will be used to protect health and safety, and the procedures which will be used to protect health and safety.

- 1.2. The existing license authorizes possession of transuranic isotopes and fission products as waste resulting from processing enriched uranium. The application requests authority to continue processing enriched uranium, but it fails to include these possession limits. Explain why authority to possess these wastes is no longer required.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that each application contain information on the activity for which the SNM is requested.

- 1.3. Section 1.2.4.6 requests a renewal period of 40 years. NRC has identified several, significant failures of NFS to comply with regulatory requirements in recent years. In response to these failures, NFS has committed to extensive and ongoing improvements in several program areas. These areas include configuration management, safety culture, and human performance. It will take several years to complete the program improvements and evaluate their effectiveness. In addition, the holding company which owns NFS was recently purchased by Babcock and Wilcox Nuclear Operations Group. It is unclear what impact this new corporate parent will have on the performance of NFS' programs. Provide the basis for requesting a 40-year license term while so many extensive and ongoing changes are being made.

This information is required to make the findings in 10 CFR 70.23 that the applicant's programs are adequate to protect health and to minimize danger to life or property.

- 1.4. Section 1.2.5.3 of the application requests to continue the special authorization to incinerate waste and scrap material. It is our understanding that the incinerator is not operating and has not operated for many years. In addition, incinerator technology has improved in recent years. NRC would need to review any decision to restart incinerator operations. Given the high safety significance of this system, the function and protection of this system would need to be addressed in the fire safety program. In addition, the hazards associated with the incinerator would need to be addressed in the Integrated Safety Analysis (ISA) and the results added to the appropriate ISA

Enclosure

Summary. Explain the basis for continuing the special authorization to incinerate waste and scrap material.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that each application contain information on the activity for which the SNM is requested, the equipment and facilities which will be used to protect health and safety, and the procedures which will be used to protect health and safety.

- 1.5. Section 1.2.5.5 of the application requests to continue the exemption from the requirements in 70.25 regarding funding methods for decommissioning financial assurance. Clarify the exemption to state that it is limited to the use of a statement of intent (or an equivalent contract clause) from a government agency.

This information is required to verify compliance with the requirements in 10 CFR 70.25 for decommissioning financial assurance.

- 1.6. Section 1.2.5.6 of the application requests to continue a special authorization to remediate/decontaminate facilities or grounds. The existing Safety Condition S-26 states that before conducting these activities, NFS must determine the status of procedures and activities with respect to the requirements of 10 CFR 70.38(g)(1). If required, NFS must submit a decommissioning plan for NRC approval before starting the activities. Revise the special authorization to state that an evaluation concluding that no decommissioning plan is required shall be documented in accordance with the provisions of 10 CFR 70.72.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that each application contain information on the procedures which will be used to protect health and safety.

- 1.7. Section 1.3.2 of the application states that approximately 4,500 people live within one mile of the NFS site. However, the Site ISA Summary states that the number is 2,800 people; and the Emergency Plan states that the number is 1,800 people. Confirm which number is correct and revise the other documents to match.

This information is required to verify compliance with 10 CFR 70.9 which requires that information provided by an applicant must be complete and accurate in all material respects.

- 1.8. Section 1.3.4 of the application describes the hydrology of the site. NUREG-1520 states that an acceptable application should describe the characteristics of the uppermost aquifer. Describe the characteristics of the uppermost aquifer.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that each application contain information on the place where the activity is to be performed.

- 1.9. Section 1.2.2 of the application addresses the financial qualifications of NFS to conduct licensed activities. It refers to information submitted by letter dated August 8, 2008, to support an indirect transfer of control of the license. Provide an updated balance sheet forecast and an updated income statement. The updated

information should include the two most recent fiscal years for which audited data is available, and the forecast should be approximately five years into the future.

This information is required to make the finding specified in 10 CFR 70.23(a)(5) that the applicant appears to be financially qualified to engage in the proposed activities.

- 1.10. Section 1.3.5 states that bedrock strata at the site are consolidated, providing firm foundations for the buildings that lie directly on the strata or that are supported by footings. It is unclear whether buildings that house licensed activities have foundations supported by bedrock strata or the unconsolidated alluvium above the bedrock. Clarify what material is supporting the building foundations.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that each application contain information on the place where the activity is to be performed.

2. Organization and Administration

- 2.1. Section 2.2 of the application states that Figure 2-1 shows the current NFS functional organization. However, Figure 2-1 differs from organizational charts and resumes provided during recent management meetings. For example, in recent management meetings, information was provided about a chief nuclear safety officer who reports to the President. Figure 2-1 of the application fails to identify this position. The resume for the chief nuclear safety officer states that the officer oversees licensing activities, critical safety investigations, safety and regulatory initiatives, and planning activities. In addition, the chief nuclear safety officer serves as an alternate to the Director of Safety and Regulatory. The responsibilities and authorities of the chief nuclear safety officer appear to conflict with those of other managers described in the application.

Explain (by current title) how the managers in your existing organizational units fit into the framework described in your application. Demonstrate effective lines of communication and authority among the organizational units. Confirm which organizational units have responsibility for health, safety, or environmental protection. This information is required to make the finding in 10 CFR 70.23 that the procedures are adequate.

- 2.2. Section 2.3.1 of the application states that the President has the overall responsibility for safety, security, quality, and operational aspects of all activities. However, no qualifications are listed for the President. Specify the minimum qualifications for this key management position.

This information is required to make the findings in 10 CFR 70.23 that the workers are qualified by training and experience.

3. Integrated Safety Analysis

No additional information requested.

4. Radiation Protection

- 4.1. NUREG-1520, Section 4.4.1.3, Bullet 2 states that an application should “outline the radiation protection program structure and define the responsibilities of key program personnel.” Revise Section 2.3.5.2 of the application to include organizational relationships and responsibilities of technicians, health physicists, the radiation protection manager, and the radiation monitoring manager. Also, Section 4.1 of the application (bottom of the page) states that “key program personnel... will be established.” Clarify this sentence to better associate the program’s ownership responsibility with respect to key personnel discussed in Section 2.3.5.2.

This information is required to verify compliance with 10 CFR 20.1101(a).

- 4.2. NUREG-1520, Section 4.4.2.3, Bullet 6 states that an application should include as low as is reasonably achievable (ALARA) program commitments to “regularly review and revise, when appropriate, the ALARA program goals and objectives and to incorporate, when appropriate, new approaches, technologies, operating procedures or changes that could reduce potential radiation exposures at a reasonable cost.” Revise Section 4.2.2 of the application to state that ALARA goals will “incorporate, when appropriate, new approaches, technologies, operating procedures, or changes that could reduce potential radiation exposures at a reasonable cost.”

This information is required to verify compliance with 10 CFR 20.1101(b).

- 4.3. NUREG-1520, Section 4.4.3.3, Bullets 1 and 5 state that an application should commit to establish and staff a radiation protection program such that the applicant will “appoint suitably trained radiation protection personnel and to identify their authority and responsibilities,” and, “describe the minimum training requirements and qualifications for the radiation protection staff.” Revise Section 2.3.5.2 of the application as necessary to state the authority and responsibility of appointed radiation protection personnel and their training requirements. Describe the guidance or other information used to establish the training and qualification requirements.

This information is required to verify compliance with 10 CFR 20.1101(a).

- 4.4. NUREG-1520, Section 4.4.3.3, Bullet 3 states that an application should “include commitments to appoint a suitably trained radiation protection program director (typically referred to as the radiation safety officer) who has direct access to the facility manager...” Revise Section 2.3.5 or 2.3.5.2 of the application, as appropriate, to state that direct access to the facility manager (or equivalent function) is available to the radiation protection function manager and/or safety discipline manager.

This is required to verify compliance with 10 CFR 20.1101(a).

- 4.5. NUREG-1520, Section 4.4.4.3, Bullet 2 states that an application should “specify how the radiation protection procedures will be prepared, authorized, approved, and

distributed.” Revise Section 11.4.6 of the application to clarify that all active, safety-related procedures are minimally reviewed or revised on a three-year period.

This information is required to verify compliance with 10 CFR 20.1101(a).

- 4.6. NUREG-1520, Section 4.4.6.3, Bullet 1 states that an applicant should install appropriately sized ventilation and containment systems. Revise Section 4.6, or other applicable section, to state the standards or guidance that will be followed for designing the ventilation and containment systems.

This information is needed to verify compliance with 10 CFR 20.1701.

- 4.7. NUREG-1520, Section 4.4.6.3, Bullet 7 specifies that an application should “revise the written procedures for use of individual respiratory protection equipment as applicable, when processing, facility, or equipment changes are made.” Revise Section 4.6.5.3 of the application to state that procedures for use of respiratory protection equipment will be revised appropriately when processes, facility, or equipment changes are made.

This information is required to verify compliance with 10 CFR 20.1703.

- 4.8. NUREG-1520, Section 4.4.6.3, Bullet 8 specifies that an application should commit to, “maintain records of the respiratory protection program, including training for respirator use and maintenance.” Revise Section 4.6.5.3 (or 4.8.2) of the application to describe maintenance of records for the respiratory protection program including training and respirator use and respirator maintenance.

This information is required to verify compliance with 10 CFR 20.1703

- 4.9. NUREG-1520, Section 4.4.7.3, Bullets 3 and 4 specify that an application should, “identify the criteria for worker participation in the external exposure monitoring and internal exposure monitoring programs.” Revise Sections 4.7.5.1 and 4.7.6 of the application to specifically describe the criteria for inclusion of individuals in the internal exposure monitoring program and external exposure monitoring program respectively.

This information is required to verify compliance with 10 CFR 20.1502.

- 4.10. NUREG-1520, Section 4.4.7.3, Bullet 5 states that an application should communicate, “compliance with the requirements of 10 CFR 20.1202 for summation of external and internal occupational radiation exposures through the use of procedures such as those outlined in Regulatory Guide (RG) 8.7 or 8.34.” Revise Section 4.7.2 of the application, or similar section, to state that the licensee will sum external and internal exposures consistent with the requirements of 10 CFR 20.1202 and through procedures consistent with RG 8.7 or 8.34.

This information is required to verify compliance with 10 CFR 20.1202.

- 4.11. NUREG-1520, Section 4.4.7.3, Bullets 9 and 10 specify that an application should commit to, “implement the facility’s corrective action program when the results of personnel monitoring or contamination surveys exceed the applicant’s administrative personnel contamination levels,” or, “when any incident results in airborne

occupational exposures to radiation exceeding the facility's administrative limits, or the dose limits in 10 CFR Part 20, Appendix B, or 10 CFR 70.61." Revise Sections 4.7.7.8 and 4.7.11.6 (or other appropriate section) of the application to clarify that the facility's corrective action program will be implemented if either personnel contamination levels exceed facility administrative action limits or an incident results in airborne exposures that exceed facility administrative action levels. While there are statements that corrective actions will be implemented, it is not clear if this is informal or through the facility's corrective action program with its associated quality assurance, tracking, and auditing.

This information is required to verify compliance with 10 CFR 20.1101(b).

- 4.12. NUREG-1520, Section 4.4.8.3, Bullets 2 and 3 state that an application should commit to "establish a program to report to the NRC, within the time specified in 10 CFR 20.2202 and 10 CFR 70.74, any event that results in an occupational exposure to radiation exceeding the dose limits in 10 CFR Part 20," and "prepare and submit to the NRC an annual report of the results of individual monitoring, as required by 10 CFR 20.2206(b)." Clarify in Section 4.8.2 of the application that reports will be issued to the NRC, consistent with 10 CFR 20.2202 and 10 CFR 70.74, any event that exceeds the regulatory dose limits of 10 CFR 20. Also clarify, that an annual report of the results of individual monitoring will be submitted consistent with the requirements of 10 CFR 20.2206(b).

This information is required to verify compliance with the referenced regulations.

- 4.13. NUREG-1520, Section 4.4.8.3, Bullet 4 states that an application should commit to "refer to the facility's corrective action program any radiation incident that results in an occupational exposure that exceeds the dose limits in 10 CFR Part 20, Appendix B, or is required to be reported per 10 CFR 70.74, and to report to the NRC both the corrective action taken (or planned) to protect against a recurrence and the proposed schedule to achieve compliance with the applicable license condition or conditions." Revise Section 4.8.2 or 11.6 (or other appropriate section) of the application to state that any incident resulting in either exceeding the dose limits in 10 CFR 20 and its appendices or required to be reported per 10 CFR 70.74 will be referred to the corrective action program and a report generated to the NRC along with any corrective actions taken or planned along with a schedule to achieve compliance.

This information is required to verify compliance with the referenced regulations.

- 4.14. Clarify what is meant in Section 4.7.7.9, Paragraph 4 of the application when it refers to equations in Appendix B. Is the chapter missing this Appendix? Also, revise this section to state the guidance being followed to perform particle size determination.
- 4.15. Clarify what is meant in Section 4.7.9.1 of the application when it states, "... use of the DAC/ALI values specified in ICRP 68 may be used independently from methods to adjust the DAC/ALI values based on the aerosol particle studies."
- 4.16. Section 4.7.5.2 of the application states that the natural excretion rate of uranium for the NFS population is 0.3 micrograms per liter. Please revise this statement to

commit to periodic evaluations of the baseline uranium excretion rate of a representative population as determined using the methods for bioassay analysis available at NFS.

- 4.17. Section 4.7.5.5 of the application states that when bioassay exposure estimates are approximately equal to or less than those generated from air monitoring data, the air monitoring program is considered adequate. Please provide additional detail as to the criteria for determining that the data are “approximately” equal.
- 4.18. Section 4.6.4 of the application states that exhaust systems where dry material is processed are either equipped with High Efficiency Particulate Absorbing filter media or “other appropriate effluent treatment systems.” Please clarify what is meant by “other appropriate effluent treatment systems” and what criteria will be used to determine if it is appropriate.
- 4.19. Section 4.7.9.1 of the application includes the provision currently specified in License Condition S-48. Specifically, it includes the exemption that notwithstanding the requirements in Appendix B of 10 CFR Part 20, the license may use the derived air concentration (DAC) values and the adjusted annual limit on intake (ALI) values in Publication 68 of the International Commission on Radiation Protection (ICRP-68). Move this special authorization to use the ALI/DAC values from ICRP-68 to Section 1.2.5 of the application, Special Exemptions and Special Authorizations. It is important that we keep track of exemptions from the regulations.

5. Criticality Safety

- 5.1. Explain the apparent discrepancy between your commitment to ANSI/ANS-8.3, as modified by RG 3.71, and the statement in Section 5.4.1 of the License Application which states that exemptions from the Criticality Accident Alarm System (CAAS) monitoring requirements include “situations where a criticality accident is determined to be not credible.” The wording in Section 5.4.1 seems to restate the part of ANSI/ANS-8.3 that is not endorsed by the NRC as stated in RG 3.71.

This information is needed to verify compliance with 10 CFR 70.24 which requires that a CAAS be maintained in each area where SNM is handled, used, or stored for facilities authorized to possess greater than a critical mass of SNM.

- 5.2. Describe the “NCS Policy.” Section 5.3.2 states that NFS employees receive instruction training regarding the “NCS Policy;” however, the key features of the policy are not defined in the application.

This information is needed to verify compliance with 10 CFR 70.62(a) which requires a safety program that demonstrates compliance with the requirements of 10 CFR 70.61.

- 5.3. Provide a demonstration that 10 centimeters and 2.5 centimeters of water (or “partial reflection”) can be used to conservatively represent reflection in Section 5.5.2 for Multiple Portable Containers and Enclosures/Gloveboxes. In addition, provide an explanation as to where these reflectors will be placed in relation to the containers/enclosure/gloveboxes; it is not apparent what “side” of the container(s) the

applicant is referring to in the License Application. The text is also confusing in this part, since it talks about “close-fitting” in one sentence, but then talks about tangential slabs/boxes in another sentence. Also, provide the management measures that will be used to ensure the assumptions used for “partial reflection” are not exceeded. The NRC prefers compliance to be demonstrated with a 2.5 centimeter, close-fitting reflector for normal conditions and full reflection for accident conditions. Use of less conservative methods (partial reflection) should be limited to cases where compliance cannot be demonstrated using preferred methods. Define the limits that will be placed on the use of less conservative methods.

The use of a 2.5 centimeter, close-fitting reflector has historically been used to account for the reflection effects from personnel or nearby structural or transient materials near units that contain or may contain SNM. Explain how your models are as conservative as this method or can be ensured to be conservative for all normal and credible abnormal conditions. Also, explain how apparently reducing the margin of subcriticality is appropriate for your facility, especially since you may use highly enriched SNM in some processes. The NRC would expect these processes to have at least the same margin as what has historically been used, not less. Explain the reasoning for this apparent reduction in margin.

This information is needed to verify compliance with 10 CFR 70.61(d). Demonstration of these assumptions, used in designing the facility, is necessary to ensure that the process remains subcritical under both normal and credible abnormal conditions.

- 5.4. In Sections 5.1.1 and 5.5.1 (and elsewhere), describe what is meant by the phrases, “where practicable” and “when practicable” when referring to the preferred hierarchy of controls. State whether there is a specified procedure for making the determination of practicability. Also, explain who decides what is practicable and describe how the determination is made.

This information is needed to verify compliance with 10 CFR 70.62(a) which requires that each licensee establish and maintain a safety program that demonstrates compliance with the requirements of 10 CFR 70.61. Nuclear criticality safety (NCS) is an important feature for the safety assessment of the design bases of the principal structures, systems, and components and for the safety program that demonstrates compliance with the 10 CFR 70.61 performance requirements. The term “practicable” is rather loose in this context. This information is necessary to ensure that the design bases will provide reasonable assurance of protection against a criticality accident.

- 5.5. For all controlled parameters (especially mass, volume, and geometry), commit to consider the most reactive combinations of tolerances on the dimensions and material specifications.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that the process remains subcritical under both normal and credible abnormal conditions.

- 5.6. Clarify whether the use of moderation control requires dual independent sampling. In particular, clarify whether drawing and analyzing the samples must be done by two different individuals or using different instrumentation.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all processes be shown to be subcritical under normal and credible abnormal conditions. NUREG-1520, Section 5.4.3.4.2(12)(e), states that "When moderation is needed to be sampled, dual independent sampling methods are used." Section 5.5.2 of the License Application states that, when relying on moderation, "moderation is measured;" however, it is not made clear whether this measurement requires dual independent sampling and analysis.

- 5.7. Describe the process and/or criteria that will be used to ascertain whether a change in process conditions is sufficiently "unlikely" to meet the double contingency principle (DCP), in License Application Section 5.1.1.

This information is needed to verify compliance with 10 CFR 70.64(a)(9) which requires that new processes and facilities must comply with the DCP. The DCP states that the changes in process conditions leading to criticality must be "unlikely." However the means of making this determination are not described in the application. This information is needed to ensure that the DCP will be met.

- 5.8. Provide a commitment to indicate that two-parameter control is preferred over two controls on one parameter.

This information is needed to verify compliance with 10 CFR 70.64(a)(9) which requires that controls are chosen so as to ensure that criticality is made highly unlikely. NUREG-1520, Section 5.4.3.4.4(7)(a) states that, "The first method [two-parameter control] is the preferred approach [over single-parameter control] because of the difficulty of preventing common-mode failure when controlling only one parameter."

- 5.9. Describe the method and program used to report and correct NCS deficiencies. The application does not discuss whether or not NCS deficiencies are reported to the NCS function nor does it describe the program details. Without this information it is not clear to the NRC staff that NCS personnel can provide a timely or adequate response to an NCS deficiency.

This information is needed to verify compliance with 10 CFR 70.62(a) which requires that each licensee establish and maintain a safety program that demonstrates compliance with the requirements of 10 CFR 70.61.

- 5.10. Describe whether there is a minimum reflection condition to account for the presence of nearby structural or transient materials (e.g., one inch tight fitting reflector). If this is not used, justify why the models are adequately bounding.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes must be assured to be subcritical under normal and credible abnormal conditions. NUREG-1520, Section 5.4.3.4.1(10)(a), states that "NCS safety limits...and limits on NCS controlled parameters will be established assuming credible optimum conditions... unless specified controls are implemented to control the limit to a certain range of values." Since there will always be some materials at some distance from the fissile system, unless specific controls are established to preclude them, criticality calculations must take them into account.

- 5.11. Clarify whether the justification for taking exception in certain instances to the preferred design philosophy in License Application Section 5.5.1 will be documented in Plant nuclear criticality safety evaluations (NCSEs). Describe how decisions are made to use an administrative control instead of an engineered control, or an active control instead of a passive control. Specify how the basis for these decisions will be documented.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes must be assured to be subcritical under normal and credible abnormal conditions. NUREG-1520, Section 5.4.3.4.2(3), states that, in addition to the preferred hierarchy of passive over active and engineered over administrative controls, "When using a control, the choice of the type and manner should be justified." This is necessary to ensure that the preferred design philosophy is adhered to the greatest extent practicable.

- 5.12. State whether the full range of interstitial moderation is considered in evaluating normal and abnormal conditions.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes must be assured to be subcritical under normal and credible abnormal conditions. NUREG-1520, Section 5.4.3.4.1(10)(a), states that "NCS safety limits...and limits on NCS controlled parameters will be established assuming credible optimum conditions... unless specified controls are implemented to control the limit to a certain range of values." License Application Section 5.4.5.1 states that "the possibility of full water reflection is considered when performing analyses." However, there may be instances (e.g., strongly coupled arrays) in which full flooding is not the most reactive case.

- 5.13. When using handbooks to derive subcritical limits, describe the amount of margin used (e.g., 90 percent of the minimum critical diameter). Describe how the handbooks are validated for use in setting subcritical limits.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes must be assured to be subcritical under normal and credible abnormal conditions. NUREG-1520, Section 5.4.3.4.1(7), states that the applicant should validate each methodology used for NCS, including "experimental data, reference books, hand calculations, deterministic computer codes, probabilistic computer codes, consensus standards."

- 5.14. Explain how you will determine an adequate margin of subcriticality, including margins to protect against uncertainties in process variables and against limits being accidentally exceeded. Also, state whether these will be based on keff sensitivity studies and the ability of controls to maintain operating limits.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires the risk of nuclear criticality accidents be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.

- 5.15. State how margin will be determined when standards or handbooks are used to determine subcriticality.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires the risk of nuclear criticality accidents be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.

- 5.16. Commit to the ANSI/ANS-8 NCS standards as endorsed by the NRC in RG 3.71, Revision 1, which are applicable to activities at NFS. Alternatively, justify how the commitments in the License Application meet the intent of the standard. The specific version of each standard (e.g., ANSI/ANS-8.1-1998) must be indicated as part of the commitment.

Explain the commitments (or lack of commitments) to the following standards in the application:

- ANSI/ANS-8.7-1998. The License Application mentions this standard, but does not seem to fully commit to the standard when storing fissile material.
- ANSI/ANS-8.17-2004. The License Application does not mention this standard.

This information is needed to verify compliance with 10 CFR 70.22(a)(8) which requires that the License Application include proposed procedures to avoid nuclear criticality accidents. This information is needed to ensure that the procedures for NCS are adequate to protect public health and safety and minimize danger to life or property.

- 5.17. Commit to maintain, at the facility, a documented evaluation that demonstrates that the CAAS meets the requirements of 10 CFR 70.24.

This information is needed to verify compliance with 10 CFR 70.24 which requires a CAAS be maintained in each area where special SNM is handled, used, or stored for facilities authorized to possess greater than a critical mass of SNM.

- 5.18. The License Application does not state that documented NCSEs establish the NCS bases for a particular system under normal and credible abnormal conditions. The License Application also does not state that NCSEs identify specific controls necessary for the safe and effective operation of a process. Amend the License Application to include these commitments.

In addition, address the following regarding these commitments:

- Commit to determine and explicitly identify in the NCSEs the controlled parameters and their associated limits upon which NCS depends.
- Commit to implement and maintain criticality safety controls that are capable of controlling these parameters within the limits identified in the NCSEs.
- Commit to demonstrate, within the NCSEs, that those criticality safety controls designated as items relied on for safety (IROFS) are sufficient to ensure that each process will remain subcritical under all normal and credible abnormal conditions regardless of any other controls which may be implemented.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes be subcritical under both normal and credible abnormal

conditions. 10 CFR 70.61(e) states that controls needed to comply with 70.61(d) shall be designated as IROFS.

- 5.19. Provide the most recent validation report for NFS as described in License Application Section 5.5.4 and a summary of the validation reports for other calculational methods (License Application Section 5.5.2) used at NFS. The summary should include a description of the validated areas of applicability, which are relevant to NFS activities, for each NCS calculational method.

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes be subcritical under both normal and credible abnormal conditions, including use of an approved margin of subcriticality for safety. NUREG-1520, Section 5.4.3.4.1(7)(b) states that the area of applicability of the code should be described. This information is needed to ensure that calculational methods are only used within valid bounds.

- 5.20. Justify the use of a 0.015 minimum margin of subcriticality (License Application Section 5.5.4).

This information is needed to verify compliance with 10 CFR 70.61(d) which requires that all nuclear processes be subcritical under both normal and credible abnormal conditions, including use of an approved margin of subcriticality for safety.

6. Chemical Safety

No additional information requested.

7. Fire Safety

- 7.1. Section 7.4.3 of NUREG-1520, states that an application is acceptable if it includes commitments to specified standards. There is no commitment in Chapter 7, your application to National Fire Protection Association (NFPA) 10, "Standard for Portable Fire Extinguishers;" NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water Based-Fire Protection Systems;" NFPA 30, "Flammable and Combustible Liquids Code;" NFPA 70, "National Electrical Code;" NFPA 72, "National Fire Alarm Code;" NFPA 101 "Life Safety Code;" NFPA 220, "Standard on Types of Building Construction;" and NFPA 221, "Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls." Please revise Chapter 7 of your application in the appropriate locations to provide this information or specific details that demonstrate an equivalent level of safety as provided by each of the previously referenced standards.

This information is needed to verify compliance with 10 CFR 70.62(a).

- 7.2. Section 7.4.3.3 of NUREG-1520, states that an application is acceptable if it includes information on design features to prevent physical security requirements from inadvertently delaying worker egress and fire fighter access. Please revise Section 7.4.1 of your application to provide this information.

This information is needed to verify compliance with 10 CFR 70.62(a).

- 7.3. Section 6.5.1 of your currently approved License Application provides details on a carbon dioxide fire suppression system in selected areas of the KAST Uranium Recovery Facility. Given the high safety significance of this system, please revise Section 7.6.3 of your application to provide similar details.

This information is needed to verify compliance with 10 CFR 70.62(a).

- 7.4. Safety Conditions S-12, S-16, S-17, S-18, and S-19 of your current license require detailed features of protection to be provided by specific dates. Provide documentation that verifies that these Safety Conditions were completed, installed on time, and remain fully compliant with the conditions specified.

This information is required to verify compliance with 10 CFR 70.22 which requires, in part, that the application include information on the facilities and procedures to protect health and safety.

8. Emergency Management

No additional information requested.

9. Environmental Protection

- 9.1. Clarify the frequency of air sampling for process areas, inactive process areas and decommissioning areas.

Section 9.1.1.1 of the application states that, at a minimum, all radioactive sample points are collected and analyzed weekly. Please clarify if this includes all airborne effluents (as noted above) that are not sampled continuously (potential to release airborne concentrations greater than or equal to 10 percent of the values in 10 CFR 20, Appendix B, Table 2, Column 1). Please revise Sections 9.1.1 & 9.1.1.1 to include this information.

This information is needed to determine compliance with 10 CFR 20.1501(a) which requires surveys that may be necessary for evaluating concentrations or quantities of radioactive material and the potential radiological hazards as are reasonable under the circumstances.

- 9.2. Describe how NFS practices encompass the known or expected concentrations of radionuclides in effluents.

NUREG-1520, Section 9.3.2.2, Bullet 2 states that the applicant's practices should encompass the following: "known or expected concentrations of radionuclides in effluents." Justify the screening levels used and the actions taken when radionuclides are detected. Please revise Sections 9.1.1 and 9.1.2 to include this information.

This information is needed to determine compliance with 10 CFR 70.23(a)(3) and (a)(4) which require that equipment and procedures are adequate to protect health and minimize danger to life or property.

- 9.3. Clarify whether any effluent discharge points have inputs from two or more contributing sources.

NUREG-1520, Section 9.4.3.2.2, Section (1)(c) states that an acceptable program will sample each contributing source to a discharge point. Identify any effluent discharge points that have inputs from two or more sources. If so, describe the sampling performed on each contributing source. Please revise Section 9.1.2.1 to include this information.

This information is needed to verify compliance with 10 CFR 70.23(a)(4) which requires that procedures are adequate to protect health and minimize danger to life or property.

- 9.4. Provide information on the minimum detectable concentrations (MDCs) for liquid and airborne effluents and environmental media sampling points.

NUREG-1520, Section 9.3.2.2, Bullet 6 states that the applicant's effluent and environmental monitoring practices should include: "sampling collection and analysis procedures, including the minimum detectable concentrations of radionuclides." While the License Application discusses sampling collection and analysis procedures, it does not state the MDCs of radionuclides. Provide a list of the MDCs or specify the limits within which the MDCs will be maintained. Provide MDC information for airborne and liquid effluents for both gross alpha and beta. Provide MDC information for gross alpha and beta with respect to ambient air and groundwater; and MDC information for gross alpha for soil, silt/sediment, and vegetation. Please revise Sections 9.1.1.2 and 9.1.2.2; and 9.2.1 through 9.2.6.

This information is needed to determine compliance with 10 CFR 70.23(a)(3) and (a)(4) which require that equipment and procedures are adequate to protect health and minimize danger to life or property; and 20.1501 which requires surveys that may be necessary for evaluating concentrations or quantities of radioactive material and the potential radiological hazards as are reasonable under the circumstances.

- 9.5. Describe action levels for effluents and environmental media sampling points.

NUREG-1520, Section 9.3.2.2, Bullet 7 states that the applicant's effluent and environmental monitoring practices should specify: "action levels and actions to be taken when the levels exceeded." While the application describes some of the action taken when levels are exceeded, the actions levels were not provided, but it was stated that these levels are in procedural guidance. Please describe these action levels for airborne and liquid effluents and environmental sampling (ambient air, soil, silt/sediment, vegetation, and groundwater). In addition, please clarify if these action levels are reviewed periodically to determine if they are still appropriate. Please revise Sections 9.1.1.2 and 9.1.2.2; and 9.2.1 through 9.2.6 to include this information.

This information is needed to determine compliance with 10 CFR 70.23(a)(4) which requires that procedures are adequate to protect health and minimize danger to life or property.

- 9.6. Provide a description of waste minimization techniques implemented at NFS.

The License Application states that waste minimization practices are implemented at NFS; however, it does not describe any techniques to minimize waste. Provide a description of waste minimization techniques NFS performs currently or plans to perform in the future. Please revise Section 9.4 to include this information.

This information is needed to determine compliance with 10 CFR 20.1101(b) which requires procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are ALARA.

- 9.7. Clarify and describe the procedure for monitoring effluents in storm water.

Section 9.1.2 (Liquid Effluents) of the application states that storm water from NFS' Blended Low Enriched Uranium Complex drains into a culvert which parallels the northwest Plant boundary and subsequently empties into Martin Creek. It also states that storm water runoff is monitored by the weekly collection of grab samples from Martin Creek. Describe how often storm culverts are sampled and justify the frequency. For samples taken downstream of the Plant, describe the dilution factor used to estimate the effluent concentration at the Plant boundary. In addition, please describe the action levels are being used for sample results and how those action levels compare to the limits set forth in 10 CFR Part 20, Appendix B.

This information is needed to determine compliance with 10 CFR 20.1302 which requires monitoring of effluents to demonstrate compliance with public dose limits; and 10 CFR 70.23(a)(4) which requires that procedures are adequate to protect health and minimize danger to life or property.

- 9.8. Clarify the sampling type and frequency for soil, vegetation, and silt/sediment.

Table 9-2 of the application for soil, vegetation, and silt/sediment notes measuring only for gross alpha; but the text states that gross alpha and gross beta analysis will be performed (Sections 9.2.2, 9.2.3, and 9.2.4). If NFS is sampling and analyzing for gross beta for soil, vegetation, and silt/sediment, what is the sample type and collection frequency? Please revise the text and/or table to reflect this information.

- 9.9. Clarify monitoring of wells adjacent to the underground storage tanks holding liquid effluents.

The Safety Evaluation Report prepared for the last License Renewal (1999) stated that NFS monitored the groundwater adjacent to the underground storage tanks. Please clarify if NFS is continuing to monitor groundwater from one up-gradient well and one down-gradient well adjacent to 6000-gallon underground storage tanks holding radioactive effluents prior to transfer to the waste water treatment facility. Please revise Section 9.2.6 to include this information.

This information is needed to determine compliance with 10 CFR 20.1501(a) which requires surveys that may be necessary for evaluating concentrations or quantities of radioactive material and the potential radiological hazards as are reasonable under the circumstances.

9.10. The staff would be interested in the current status of groundwater monitoring required by other agencies. Although not required to demonstrate compliance with NRC requirements, it was addressed in the Safety Evaluation Report for the last License Renewal. The information would help the staff answer questions from the public.

9.11. Describe the total number of monitoring wells available at the NFS site, and explain why the groundwater monitoring commitment in the application is adequate.

Section 9.2.6 of the application (Groundwater Monitoring) states that, at a minimum, 11 wells are monitored quarterly. Please clarify how many other wells are present; and describe any monitoring conducted at the wells. Explain why the commitment to monitor 11 wells is adequate to demonstrate compliance with NRC regulations.

This information is needed to determine compliance with 10 CFR 20.1302 which requires monitoring of effluents to demonstrate compliance with public dose limits and 20.1501 which requires adequate monitoring/surveying to characterize the radiological hazard.

9.12. Describe how the radiation protection program is being reviewed. For example, trends in data, changes in design/operations needed to meet ALARA goals, and environmental monitoring.

This information is needed to determine compliance with 10 CFR 20.1101(c) which requires that, at least annually, the radiation protection program content and implementation is reviewed. Please add a Section to Chapter 9 to include this information or reference Chapter 4 (Radiation Protection).

9.13. Clarify the meteorological data used in the assessment of the maximum concentration at the site boundary and maximum offsite dose.

Section 9.1.1.4 of the application states that site-specific meteorological data, when available, or conservative meteorological parameter values are used in the assessment of the maximum concentration at the site boundary and the maximum offsite dose. Describe how site-specific meteorological data is obtained, and explain why it might be unavailable. Also describe the conservative values that are used, and provide the basis for using those values. Please revise Section 9.1.1.4 to include this information.

This information is needed to determine compliance with 10 CFR 20.1302, which requires monitoring of effluents to demonstrate compliance with public dose limits, and 10 CFR 20.1501, which requires adequate monitoring/surveying to characterize the radiological hazard.

9.14 Clarify the action levels used for monitored constituents in sewer discharges and other surface water effluents.

Section 9.1.2.2 of the application states that actions levels for sewer discharges and other surface water effluents are at or below concentrations listed in 10 CFR 20 Appendix B, Table 2, Column 2. For an action level to be effective, it should be set below the regulatory limit such that action can be taken before the limit is exceeded.

Commit to an upper limit for the action levels (i.e., no more than X percent of the regulatory limit). Please revise Section 9.1.2.2 to include this information.

This information is needed to determine compliance with 10 CFR 20.1302 which requires monitoring of effluents to demonstrate compliance with public dose limits, and 10 CFR 20.1501 which requires adequate monitoring/surveying to characterize the radiological hazard.

10. Decommissioning

10.1. Provide an amended Schedule A for the Citibank Standby Trust dated February 6, 2009. The amended schedule should address the following concerns under the section titled *Cost Estimate for Regulatory Assurances Demonstrated by this Agreement*:

- In the line that reads “SNM-124 - \$7,225,637.00,” the dash immediately preceding the dollar amount implies a negative cost estimate. Replace the dash immediately preceding the dollar amount with a colon or similar mark.
- The date is missing from the line that reads, “The cost estimate listed here was last adjusted and approved by the NRC on [insert date].” Insert the date of the most recently approved cost estimate.

This information is needed to verify compliance with 10 CFR 70.25(f) which requires financial assurance to be provided by an approved funding method.

10.2. Provide a master list of every contaminated area of the site that is unsuitable for unrestricted release. This list should include all legacy areas that require additional remediation before the license is terminated (i.e., Southwest burial trenches, former Building 234 site, etc.). For each contaminated area, provide the latest estimate of the total cost to decommission the area including a reference to the letter which submitted the detailed cost estimate to the NRC. In addition, specify the mechanism which assures the funds for decommissioning each contaminated area including a reference to the letter which submitted the mechanism to the NRC. The master list should address the following issues where applicable:

- The status of any funding mechanisms submitted previously which are no longer needed.
- For each prepayment mechanism, provide a recent bank statement or other documentation which confirms the current balance in the account.
- For each surety mechanism, specify the trust to which the funds are payable, including a reference to the letter which submitted the trust documents to the NRC.

This information is needed to verify compliance with 10 CFR 70.25(e) which requires a cost estimate for decommissioning and a description of the method of assuring funds.

10.3. Submit a revised Certification of Financial Assurance that reflects the master list information requested above.

This information is needed to verify compliance with 10 CFR 70.25(e) which requires a certification of financial assurance.

10.4. For each contaminated area identified in response to Item 10.3 above, provide the following information:

- Are principal activities (as defined in 70.4) still being conducted? If not, when did principal activities cease?
- Is an NRC-approved decommissioning plan working (provide reference), planned, or not required (provide basis)?
- When will decommissioning of the area be complete? If principal activities have ceased, but final decommissioning is being delayed, provide justification for the delay.

This information is needed to verify compliance with 10 CFR 70.38 which requires, in part, that NRC approve a decommissioning plan for certain activities and that decommissioning be conducted in a timely manner.

11. Management Measures

11.1. License Renewal Application Section 11.2.1 describes the surveillance and monitoring program for the facility. This section, however, does not discuss the methodology used to establish the surveillance frequency for IROFS and whether the approach is graded. Describe this methodology and, if graded, the basis for grading.

This information is needed to determine compliance with requirements of 10 CFR 70.62(d).

11.2. License Renewal Application Section 11.2.4 describes the functional testing and test result documentation for the facility. It states that the results of functional testing are documented and maintained as specified in Section 11.7, "Records Management." However, Section 11.7 does not address functional testing documentation. Describe how the results of functional testing will be recorded.

This information is needed to determine compliance with requirements of 10 CFR 70.62(d).

11.3. License Renewal Application Section 11.4.6 states that periodic reviews of procedures will be done. Describe the methods used to ensure that procedures will be periodically reviewed and, if necessary, revised.

This information is needed to determine compliance with requirements of 10 CFR 70.62(d).

11.4. License Renewal Application Section 11.1 does not provide information on reconstitution of design bases and requirements. Describe whether the need for reconstitution was investigated. If a reconstitution was done, describe the approach used and how the new or revised documentation was incorporated into the configuration management system.

This information is needed to determine compliance with requirements of 10 CFR 70.72.

12. Material Control and Accounting

Note: The existing license conditions contain a large number of exemptions from the regulations. The following items request justification for keeping those exemptions. For each exemption that is justified, add a non-sensitive description of the exemption to Section 1.2.5 of the application, Special Exemptions and Special Authorizations.

12.1. Provide justification for keeping each of the following safeguards conditions in the license:

- SG-1.1
- SG-2.1
- SG-4.1
- SG-4.2
- SG-4.5
- SG-4.10
- SG-4.11
- SG-4.12
- SG-4.14
- SG-4.18

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

12.2. Provide information to update the following safeguards conditions:

- SG-4.4: Identify which buildings should be included and which subparts should remain. Justify why this condition is necessary in its updated form.
- SG-5.1: Identify which chapters and annexes should be listed and the dates for the most current revisions of those chapters. Also, remove the reference to SG-5.5 if that safeguards condition is no longer needed.
- SG-5.2: Identify which chapters and annexes should be listed and the dates for the most current revisions of those chapters.

This information is needed to determine compliance with requirements of 10 CFR Part 74.

12.3. The following safeguards conditions may be removed from the license through amending the approved Fundamental Nuclear Material Control Plans (FNMCP) mentioned in Safeguards Conditions 5.1 and 5.2. Amend the appropriate FNMCP to incorporate the following safeguards conditions, or identify where the details of the safeguards condition may be found within the FNMCP:

- SG-4.8
- SG-4.9
- SG-4.15
- SG-4.15.1
- SG-4.16

- SG-4.17
- SG-4.34

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

12.4. The following safeguards conditions appear to have expired or no longer be needed. Confirm that these safeguards conditions may be removed from the license:

- SG-3.1
- SG-4.3
- SG-4.21 through SG-4.33
- SG-4.35
- SG-4.36
- SG-5.3 through SG-5.5

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

12.5. For safeguards conditions SG-4.13 and SG-4.20, justify why these conditions are necessary; and explain what effect these conditions have on the overall standard error of the inventory difference for the facility.

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

12.6. Justify the need for safeguards condition SG-4.14, and either amend the FNMCPs described in SG-5.1 and SG-5.2 to define what qualifies a system to be bias-free or identify where this information can be found in the FNMCPs.

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

12.7. Evaluate the need for SG-4.19 to remain as a safeguards condition. Determine if this procedure is explained in the approved "Physical Safeguards Plan" and whether this information could be incorporated into the FNMCPs referenced in SG-5.1 and SG-5.2. If it is necessary to keep SG-4.19 as a safeguards condition, provide justification.

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

13. Physical Protection of Fixed Facilities

13.1. Update the Category II Physical Protection Plan to address facility changes. The update should include the following items:

- In Chapter 1, update the plan to accurately describe the current controlled access area (CAA) perimeter and current entry and exit points for personnel and vehicles.
- In Section 2.2, update the Plan to describe the existing CAA perimeter.

- In the response to this question, describe proposed construction of additional security measures and the need for Plan changes when construction is complete.

This information is required to verify compliance with the physical security requirements in Part 73.

- 13.2. Update the Category III Physical Protection Plan to address current security measures. Delete references to temporary measures that are no longer being used. References to the Category I plan should be limited to necessary items, e.g., access control, alarm monitoring, response, and other security functions directly related to the Category I facility.

This information is required to verify compliance with the physical security requirements in Part 73.

14. Physical Security of Special Nuclear Material in Transit

- 14.1. Update the Category II Transportation Security Plan to be consistent with the reporting requirements in 10 CFR 74.15.

This information is needed to determine compliance with the requirements of 10 CFR Part 74.

- 14.2. Provide justification for the continued use of License Condition TR-1.2. If justified, update the transportation section of the Category III Physical Protection Plan to incorporate the condition into the Plan. Add a non-sensitive description of the exemption to Section 1.2.5 of the application (Special Exemptions and Special Authorizations). This will allow us to keep track of the exemption while keeping the sensitive information in the Physical Protection Plan.

This information is required to verify compliance with the physical security requirements in Part 73.