April 19, 2004

Mr. Rod Krich, Vice President
Licensing, Safety, and Nuclear Engineering
Louisiana Energy Services
2600 Virginia Avenue NW, Suite 610
Washington, DC 20037

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON LOUISIANA ENERGY SERVICES PROJECT LICENSE APPLICATION

Dear Mr. Krich:

We have completed the initial technical review of your license application for a gas centrifuge enrichment facility proposed to be constructed in Eunice, New Mexico. Your application was submitted on December 12, 2003.

Our technical review identified the need for additional information or clarifications as indicated in the attachment. Please submit responses to the requests for additional information within 30 days of this letter.

If you have any questions, please contact me at 301-415-7299.

Sincerely,

/RA/

Timothy C. Johnson, Project Manager
Gas Centrifuge Facility Licensing Section
Special Projects Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: Requests for Additional Information

Docket No. 70-3103

cc: William Szymanski/DOE
James Curtiss/W&S
Peter Miner/USEC
James Ferland/LES
Dennis Holmberg/Lea County
James Brown/Eunice
Monty Newman/Hobbs
Michael Marriotte/NIRS
Lee Cheney/CNIC
Claydean Claiborne/Jal
Troy Harris/Lovington
Betty Rickman/Tatum
Glen Hackler/Andrews
William Floyd/New Mexico
Richard Ratliff/Texas
Jerry Clift/Hartsville
Derrith Watchman-Moore/New Mexico

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DAyres/Reg II	DSeymour/Reg II	RHannah/Reg II	KClark/Reg II
RTrojanowski/Reg II	KO'Brien/Reg III	VMitlyng/Reg III	WMaier/Reg IV
WTRoskowski	RWescott	FBurrows	DBrown
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NAME	TJohnson/dw		LGross		BSmith		LClark		JGiitter	
DATE	4/ 15/04		4/ 16/04		4/ 19 /04		4/ 19 /04		4/19 /04	

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Louisiana Energy Services Gas Centrifuge Uranium Enrichment Plant
Requests for Additional Information

Chapter 1.0 General Information

GI-1 Section 1.2.1.2, pp. 1.2-1 and 1.2-2

Provide a copy of the LES Partnership Agreement.

Regulations in 10 CFR 70.22(a)(1) require the applicant to provide the corporate name of the applicant and the name of the State where it is incorporated or organized.

The applicant provided general information on the partnership structure. However, information on the financing and partnership control responsibilities needs to be provided.

GI-2 Section 1.2.1.2, 1st Para., p. 1.2-1

Provide the name of the LES subsidiary formed for the purpose of purchasing the Lea County Industrial Revenue Bonds and the name of the State where it is incorporated or organized. Also, provide a copy of the Industrial Revenue Bond agreement with Lea County.

Regulations in 10 CFR 70.22(a)(1) require the applicant to provide the corporate name of the applicant and the name of the State where it is incorporated or organized.

LES indicated that it has a wholly-owned subsidiary for the purpose of purchasing Industrial Revenue Bonds issued by Lea County, but did not provide its name or State of incorporation or organization. In addition, the Industrial Revenue Bond agreement needs to be provided to verify the licensing responsibilities of the applicant and Lea County.

GI-3 Section 1.2.2, p. 1.2-3

Provide a detailed estimate of the cost to construct the plant.

The regulations in 10 CFR 70.22 provide that where the nature of the proposed activities requires consideration of the applicant's financial qualifications, the Commission may request information with respect to financial qualifications.

The applicant estimated the cost to construct the plant at approximately $1.2 billion in 2002 dollars. The applicant stated that this estimate is the cost to design and construct the facility, and the estimate excluded escalation, a contingency, interest, and any replacement equipment that may be needed during the life of the plant. The application did not provide a detailed basis that supported the $1.2 billion estimate. Because the NRC must make a finding in accordance with 10 CFR 70.23(a)(5), regarding whether the applicant appears to be financially qualified to engage in the purposed activities, the staff will need to review the supporting basis for the $1.2 billion estimate. The validity of the estimated cost, with its supporting assumptions is a key factor in determining if the applicant is financially qualified. LES should submit a detailed estimate of the cost to construct the plant.

Enclosure

GI-4 Section 1.2.2, p. 1.2-4

Provide the amount of public liability insurance to be provided and the basis for the amount proposed.

Under the regulations in 10 CFR 140.13b, a licensee of a uranium enrichment facility must have and maintain liability insurance.

In the application, the applicant indicated that when the plant is ready for operation it will obtain liability insurance coverage to closely approximate the $300 million limit. The applicant needs to provide the amount of coverage it will obtain to meet the requirements in 10 CFR 140.13b. In addition, the regulations require that the liability insurance be obtained prior to issuing the license, not prior to operations.

GI-5 Section 1.2.3, p. 1.2-4

Provide possession limits for all proposed licensed material in terms of total quantity to be possessed.

Regulations in 10 CFR 70.22(a)(4) require an applicant to identify the name, amount, and specifications of the material proposed for use.

The applicant in Table 1.2-1 provides information on the types of material proposed for use in average annual quantities. The applicant should provide total quantities of licensed material to be possessed. In addition, any other licensed material, including potential sources of contamination in UF_6, such as Tc-99, and any calibration sources proposed to be used should be identified and quantity limits proposed.

Chapter 2.0 Organization and Administration

OA-1 Section 2.1.1, p. 2.1-1 and Figures 2-1 and 2-2

Clarify the organization charts for the design and construction organization and the operating organization.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Figure 2.1-1 provides a diagram of the proposed organization for design and construction. Figure 2.1-2 provides a diagram of the organization for operations. However, the references in Figure 2.1-1 to Figure 2.1-2 are confusing and appear to duplicate some positions (e.g., Health, Safety, and Environment Manager).

OA-2 Sections 2.2.1, p. 2.2-2 & p. 2.2-4; 2.2.4, pgs. 2.2-9 - 2.2-10; 5.1.5,pgs. 5.1-4 - 5.1-5; and Emergency Plan Section 4.1, p. 4.1-2 & p. 4.1-4

Clarify the positions and responsibilities of the Health, Safety, and Environmental Manager, Criticality Manager, Criticality Safety Engineer, and Nuclear Criticality Engineer.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Sections 2.2.1 and 2.2.4 identify the operating organization and personnel qualification requirements, including those for the Health, Safety, and Environment Manager and Criticality Safety Engineer. Section 5.1.5 identifies relevant Nuclear Criticality Safety staff, including a Nuclear Criticality Manager and a Nuclear Criticality Engineer that are not described in Section 2.2.1 and 2.2.4. Also, the responsibilities described in Chapter 2.0, Chapter 5.0, and the Emergency Plan for the same positions are different.

OA-3 Sections 2.2.1, p. 2.2-2; and 2.2.4, p. 2.2-4

Provide the qualifications of individuals that may be designated to (1) review and approve changes to the facility or activities of personnel that require NRC approval prior to making the change, in place of the Health, Safety and Environment Manager and (2) review and approve changes to the facility or to operations that involve chemical, radiation hazard, or criticality considerations prior to making the change, in place of the Health, Safety, and Environmental Manager.

10 CFR 70.22(a)(6) requires the technical qualifications, including training and experience, of the applicant and staff to engage in the proposed activities.

Section 2.2.1.E refers to “designees” that have approval authority in place of the Health, Safety, and Environmental Manager. However, there needs to be a discussion of the qualification requirements for these individuals in either Section 2.2.1 or Section 2.2.4.

OA-4 Section 2.2.1, 2.2.4, and 5.1.5, General

Clarify which position(s) will be responsible for the NCS management and NCS supervision activities described in ANS-8.19, “Administrative Practices for NCS” and provide this information in either Section 2.2.3 or Section 5.1.5.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Sections 2.2.1, 2.2.4, and 5.1.5 need to clearly describe which individual has responsibility for different elements of the NCS program. It is unclear if the Health, Safety, and Environment Manager has responsibilities for both NCS management and NCS supervision as well as what the phrase “administration of NCS reviews” means. It is unclear if the Criticality Safety Engineer has responsibilities for both NCS supervision and NCS staff. Also, it is unclear whether a Criticality Safety Engineer will be onsite during all shift operations, and, if not, whether a Criticality Safety Engineer will be able to effectively respond to emergency conditions.

Chapter 3.0 Integrated Safety Analysis Summary

ISA-1 Chapter 3.0, General

Clarify the separation between the Integrated Safety Analysis (ISA) Summary, which does not need to be incorporated into the license, and the programmatic commitments related to the ISA and ISA Summary that are required to be in the application.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b) requires the ISA Summary to be submitted with the license application, but shall not be incorporated into the license.

It is unclear what part of Chapter 3.0 are the programmatic commitments for the ISA and ISA Summary as well as descriptions of how to meet those commitments that are needed to meet 10 CFR 70.62(a) and 70.65(a) versus what part of Chapter 3.0 is the ISA Summary that is needed to meet 10 CFR 70.65(b).

ISA-2 Sections 3.0, 3.1.1, 3.1.1.1, 3.1.5, 5.1.6, 5.2, 5.3, and Emergency Plan Section 4.1, General

Clarify the different terminology used for NCS documents and provide the purpose, use, content, and relationships between the documents in Chapter 5.0.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Throughout the application, there are different terms used for NCS documents, such as: NCS analyses, NCS assessments, NCS determinations, NCS evaluations, criticality safety analyses, criticality safety assessments, criticality safety evaluations, criticality evaluations, criticality assessments, and criticality evaluations. It is unclear if these documents have different purposes, uses, and content. It is unclear how each document relates to the others.

One example is the use of NCS Determinations. Section 3.1.5 describes one purpose (i.e., "NCS Determinations are specialized studies that assure the risk of having a criticality accident is highly unlikely, and that the double contingency principle is satisfied."); Section 5.2.1.3 describes a different purpose (i.e., "The NCS Determinations presented in Section 5.3 provide values of k-eff to conservatively meet the USL."); and, during the site visit to Massachusetts in March 2004, applicant staff indicated a third purpose and applied in a way during the ISA process not described in the application (i.e., NCS Determinations were unclassified summaries of the four basic applicant NCS documents - three bounding NCS evaluations and a critical dimensions document).

ISA-3 Sections 3.1.1, p. 3.1-1 and Chapter 3.0, General

Clarify whether the statement in Section 3.1.1, "The approach used for performing the ISA is consistent with Example Procedure for Accident Sequence Evaluation, Appendix A to Chapter 3.0 of NUREG-1520 (NRC, 2002)" was intended to mean a commitment to follow the example in the NUREG.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

For example, Tables 3.1-7, 3.1-8, 3.1-9, 3.1-10, and 3.1-11 are essentially the same as those in Appendix A to Chapter 3.0 of NUREG-1520, Tables A-4, A-8, A-9, A-10, and A-11, respectively. However, it is unclear if the tables were used properly because the descriptions of the tables in the ISA Summary did not include all the accompanying text from NUREG-1520 that describes how the tables should be used.

ISA-4 Section 3.1.1.1, p. 3.1-2

Clarify the differences in the terminology "normal and bounding conditions" and "normal and credible abnormal conditions."

10 CFR 70.61(d) requires that the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.

In Section 3.1.1.1 the applicant described a process used for evaluating normal and bounding conditions, but there needs to be an explanation of how the "bounding conditions" relate to "credible abnormal conditions" to meet the regulations.

ISA-5 Sections 3.1.5 and 5.2.1.3, General

Clarify the approach used to meet the performance requirements of 10 CFR 70.61 and the associated regulations for NCS and provide this information in the ISA Summary.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

It is unclear what approach was used to meet the performance requirements of 10 CFR 70.61 for NCS. Examples include: (1) Section 3.1.5 indicates that the NCS Determinations were used in some manner and (2) Section 3.8.1 indicates that an alternative process was sometimes used.

ISA-6 Section 3.1.5 and 5.5

Clarify the information about the Criticality Accident Alarm Systems (CAAS).

10 CFR 70.22(a)(7) requires a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property (such as criticality accident

alarm systems). 10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including the requirements for criticality monitoring and alarms in 10 CFR 70.24.

It appears that not all the information in Section 3.1.5 is appropriate (i.e., it is not about CAAS). It appears that some of the information in Section 5.5 is appropriate for the ISA Summary (e.g., figures and text regarding the figures). For guidance only, see NUREG-1520, Section 5.4.3.4.3.

ISA-7 Section 3.1.7, page 3.1-16

Provide a discussion of how Items Relied on for Safety (IROFS) are protected from environmental conditions and dynamic effects and how the requirements of 10 CFR 70.64(a)(4) are met for individual IROFS. The discussion should consider appropriate industry standards. Also, discuss how non-IROFS will be able to withstand environmental stress caused by environmental and dynamic service conditions under which their failure could prevent satisfactory accomplishment of safety functions by IROFS. Provide information on the facility's essential utility services (if any) and how the design provides for their continued operation.

The regulations, 10 CFR 70.64(a), require that the applicant address the baseline design criteria. Specifically, 10 CFR 70.64(a)(4) requires that the design must provide for adequate protection from environmental conditions and dynamic effects associated with normal operations, maintenance, testing, and postulated accidents that could lead to loss of safety functions. Also 10 CFR 70.64(a)(7) requires that the design must provide for continued operation of essential utility services.

Section 3.1.7.D of the application stated that "Structures, systems, and components that are determined to have safety significance (IROFS) are protected against dynamic effects of missiles and discharging fluids, that may result from natural phenomena, accidents at nearby industrial, military, or transportation facilities, equipment failure, and other similar events and conditions both inside and outside the facility." Since this statement does not indicate how IROFS are protected from environmental conditions and dynamic effects, provide a discussion of how the requirements of 10 CFR 70.64(a)(4) are met for individual IROFS. The discussion should consider appropriate industry standards. Also, discuss how non-IROFS will be able to withstand environmental stress caused by environmental and dynamic service conditions under which their failure could prevent satisfactory accomplishment of safety functions by IROFS.

Section 3.1.7.G of the Safety Analysis Report stated that "On site utility service systems required to support IROFS shall be provided. Each utility service system required to support IROFS shall provide for the meeting of safety demands under normal and abnormal conditions." Since this statement does not identify the facility's essential utility services (if any) and does not discuss how the design provides for their continued operation, provide this information.

ISA-8 Section 3.1.7-I, p. 3.1-17; 3.8.1, p. 3.8-2; 5.1.1, p. 5.1-1; and 5.7, p. 5.7-1

Clarify the commitments to double contingency principle, double contingency protection, as well as clarify the quote from the ANS-8.1 standard regarding the double contingency principle.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the requirements of 10 CFR 70.64(a)(9).

There needs to be clear and consistent commitments to the double contingency principle and double contingency protection throughout Chapter 3.0 and Chapter 5.0.

Examples of inconsistency include: Section 3.1.7-I states that, “All process and storage systems shall be designed to be maintained subcritical and to ensure that no nuclear criticality accident can occur unless at least two unlikely, independent, and concurrent changes have occurred in the conditions essential to nuclear criticality safety.” Section 3.8.1 states that, “For accident sequences postulated to result in nuclear criticality, the double contingency protection requirement is satisfied by IROFS and multiple independent controls on a single process parameter.” Section 5.1.1 states that, “The adopted double contingency principle states ‘process designs shall incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible.’” Section 5.1.1 states that “In the current design, each process that has accident sequences that could result in an inadvertent nuclear criticality at the [facility] will have double contingency protection.” Section 5.7 states that, “The double contingency principle will be used in determining NCS controls and IROFS in the design of new facilities or new processes...”During the onsite visit in Massachusetts in March 2004, applicant staff indicated that for the initial design of the facility, the commitment is to the double contingency principle, as described in Section 5.1.1 and then afterwards, the commitment is to the double contingency protection, as described in Section 5.3.16.

Also, the reference to the double contingency principle from the ANS-8.1 standard, “NCS in Operations with Fissionable Materials Outside Reactors” needs to be changed to reflect that it is a different statement from that in the standard.

ISA-9 Section 3.2.6.1, pp. 3.2-23 through 3.2-29

Provide results of investigations conducted to identify any capable faults within a 322-km [200-mi] radius. Page 3.2-23 of the Safety Analysis Report states, “No Quaternary faults are mapped for the site locale. The nearest recent faulting is situated more than 161 km [100 mi] west of the site.” It is not clear if any of these faults are capable.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

Based on the information provided, the staff is unable to determine if the faults cited are capable.

ISA-10 Section 3.2.6.1, pp. 3.2-23 and 3.2-24

Include in Tables 3.2-20 and 3.2-21 of the Safety Analysis Report focal depths and distances to site for all events greater than magnitude 3. Also, include all available magnitude designations (i.e., m_b, M_L, M_s, and M_w).

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed sufficient to assess their impact on facility safety and to assess their likelihood of occurrence.

The earthquake focal depths and distances to site for all earthquake events greater than magnitude 3 and the appropriate magnitude designations are needed to appropriately consider the potential effect of earthquake events.

ISA-11 Section 3.2.6.2, pp. 3.2-24 and 3.2-25

Explain how seismic source regions for the site are determined on the basis of the earthquake frequency pattern shown on Figure 3.2-21. Specifically, explain how the spatial density was calculated and provide the appropriate units on the legend of Figure 3.2-21.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The requested information is needed to correctly read the contours shown on Figure 3.2-21.

ISA-12 Section 3.2.6.4, pp. 3.2-26 through 3.2-28

Discuss the possible effects caused by human activities such as withdrawal of fluid from or addition of fluid to the subsurface on the evaluation of tectonic structures underlying the site and the region surrounding the site. If possible, identify the seismic events related to gas and oil recovery methods in the vicinity of the site, including the magnitudes and locations of these events and the effects on the recurrence models if these events are removed.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed sufficient to assess their impact on facility safety and to assess their likelihood of occurrence.

As stated in Section 3.4.3.2.(1)c of the Standard Review Plan, the applicant should assess which events could occur without adversely impacting safety. The staff requests that the applicant provide a discussion of possible effects caused by human activities such as withdrawal of fluid from or addition of fluid to the subsurface.

ISA-13 Section 3.2.6.5, p. 3.2-29

Describe the design safety margins, structural elasticity and conservatism needed to demonstrate that use of a 10,000 year (1.0 E-4) earthquake in the detailed design process can achieve a performance level of less than about 1.0 E-5 for seismic IROFS.

10 CFR 70.64(a)(2), Natural Phenomena Hazards, requires that the design must provide for adequate protection against natural phenomena with consideration of the most severe documented historical events for the site. 10 CFR 70.61(b) requires that the risk of each credible high consequence event must be limited. High consequence events are those internally or externally (i.e., seismic) initiated events that result in specified chemical and/or radiological exposures.

Section 3.2.6.5, Selection of the Design Basis Earthquake, identifies a 10,000 year return earthquake as the design basis earthquake (DBE) to be used in the detailed design process to demonstrate compliance with the overall ISA performance requirements. Confirmatory seismic performance calculations for the seismic IROFS will be performed to demonstrate that use of the DBE will achieve a likelihood of unacceptable performance of less than approximately 1.0 E-5. The difference between the mean annual probabilities for design (1.0 E-4) and performance (1.0 E-5) is achieved through conservatism in the design (factors of safety), elasticity in the structures, and conservatism in the evaluation of the design.

ISA-14 Section 3.3.1.2.2.18, p. 3.3-8; Section 3.5.7, pp. 3.5-40 and 3.5-41; Section 3.5.9.2.1, pp. 3.5.44 and 3.5.45; and Section 5.5. p. 5.5-1

Describe the process used to conduct the human factors engineering review of the Control Room, the Communication and Alarm Annunciation System, the Central Control Room, and the Criticality Accident Alarm System as it applies to IROFS requiring operator actions.

The regulations in 10 CFR 70.61 and 70.62 require that an applicant perform an integrated safety analysis of the hazards associated with the proposed facility and demonstrate compliance with the performance requirements in 10 CFR 70.61(b), (c), and (d).

The applicant describes the Control Room in Section 3.3.1.2.2.18, the Central Control System in Section 3.5.9.2.1, the Communication and Alarm Annunciation System in Section 3.5.7, and the Criticality Accident Alarm System in Section 5.5. For those IROFS functions requiring operator actions, the applicant should describe the process used to conduct the human factors engineering review of these areas, and for any other safety - significant human-system interfaces located outside the areas. NUREG-0711, Rev. 1, “Human Factors Engineering Program Review Model,” dated 2004, and NUREG-0700, Rev. 2, “Human-System Interface Design Review Guidelines,” dated 2004, are sources that can be used to conduct this review, adjusted as appropriate for the facility ISA. Operating experience with these systems at similar Urenco enrichment facilities in Europe may also be used to conduct this review to give NRC review staff additional confidence that the facility will meet the performance requirements in 10 CFR 70.61.

ISA-15 Section 3.3.2.2.6.2, p. 3.2-28

The application states, “Rainfall loadings on roofs and other exposed surfaces result from two different events. The first event is normal heavy rainfall having a 100-year return period.”

Provide information about the rainfall with a 100-year return period, including amount and duration. Also, provide the technical basis on how this 100-year return period rainfall was determined.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The staff requires the additional information to determine how the rainfall loadings were determined from the two events stated by the applicant.

ISA-16 Section 3.3.2.2.6.2, p. 3.3-28

The application states, "The second event is localized intense rainfall associated with the Design Basis Flood. The rainfall distribution to this event is discussed in Section 3.2." The staff is unable to locate this discussion in Section 3.2 of the Safety Analysis Report. The first paragraph in Section 3.2.3.4.4 of the Safety Analysis Report discusses local intense probable maximum precipitation. The second paragraph in Section 3.2.4.3 of the Safety Analysis Report indicates no design basis flood is considered for the National Enrichment Facility site.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

Clarify these inconsistent statements. Indicate clearly where in Section 3.2 of the Safety Analysis Report the localized intense rainfall associated with the Design Basis Flood is discussed.

ISA-17 Section 3.3.2.2.6.2, p. 3.3-28

Clarify if the rainfall load resulting from the Design Basis Flood (the load equals the depth of water accumulated in excess of the roof drains capability) will be addressed in designing the safety significant areas by ensuring this load does not exceed the normal roof design live load or if this rainfall load will be treated as an additional design load.

Under 10 CFR 70.62(c)(iv), an applicant is required to address potential accident sequences caused by external events, including natural phenomena. The Standard Review Plan, NUREG-1520, on page 3-12, (1)c, states that characterization of natural phenomena (e.g., tornadoes, hurricanes, floods, and earthquakes) and other external events is needed to assess their impact on facility safety and to assess their likelihood of occurrence.

The staff requires the additional information to properly consider the roof design loads.

ISA-18 Sections 3.3.2.2.7.1, p. 3.3-29; 3.3.2.2.7.2, p. 3.3-29; and 3.3.2.2.7.4, p. 3.3-29

The equipment, piping, and electrical tray loads are given in the Safety Analysis Report as the sum of dead and live loads; no individual values are provided for these dead and live loads. Explain how the combined dead and live loads will be included in the load combination applications using the strength method for concrete design, given the load factors for dead loads and live loads are different (load combination applications A and B in Section 3.3.2.2.8.3 of the Safety Analysis Report).

Under 10 CFR 70.62(c)(iii), an applicant is required to address facility hazards that could affect the safety of licensed materials and thus present an increased radiological risk. The Standard Review Plan (NUREG-1520) on page 3-13, (3)c, states that process design and equipment information needs to include a discussion of process design, equipment, and instrumentation that is sufficiently detailed to permit an adequate understanding of the results of the ISA. As appropriate, it includes schematics indicating safety interrelationships of parts of the process.

The staff requires the additional information to ensure that the equipment, piping, and electrical tray loads have been properly considered.

ISA-19 Section 3.3.2.3, p. 3.3-33

Provide technical justification to support that allowable bearing pressure for rock at the site is 10,000 psf and it is 3,000 psf for existing and new fills.

Under 10 CFR 70.62(c)(iii), an applicant is required to address facility hazards that could affect the safety of licensed materials and thus present an increased radiological risk. The Standard Review Plan (NUREG-1520) on page 3-13, (3)c, states that process design and equipment information needs to include a discussion of process design, equipment, and instrumentation that is sufficiently detailed to permit an adequate understanding of the results of the ISA. As appropriate, it includes schematics indicating safety interrelationships of parts of the process.

Due to the difference in the allowable bearing pressures, the staff requires a technical justification that is currently not provided in Section 3.3.2.3 of the Safety Analysis Report.

ISA-20 Section 3.4, General

The regulations, 10 CFR 70.22(a)(7), require that the applicant provide a description of equipment and facilities which will be used to protect health and minimize danger to life or property. The following information is needed to evaluate the instrumentation and control (I&C) systems:

a. Submit an I&C software system architecture block diagram showing interrelationship of the major software functions with the hardware, process, and plant systems. Clearly identify which software functions are involved with IROFS. Submit codes and standards framework used and correlate with hardware functions.

b. For IROFS involving software, firmware, microcode, etc., discuss the software design process used to develop the programmable logic controller (PLC) software, as well as software quality assurance programs, including configuration management. Reference

any codes and/or consensus standards regarding hardware and software quality (e.g., IEEE, ASME).

c. For all systems with interfaces to the plant control system (PCS), describe the interfaces to the PCS, including the Central Control System (CCS) and the Local Control System (LCC). Particular attention should be paid to the interconnection of IROFS to the LCC (and CCS, if applicable). Provide information on how the safety functions are independent from the process control system components at the LCC and CCS.

d. Section 3.1.7.J states, in part, "Instrumentation and control systems shall be designed to fail into a safe state or to assume a state demonstrated to be acceptable on some other basis if conditions such as disconnection, loss of energy or motive power, or adverse environments are encountered." For IROFS relying on "fail safe" instrumentation, describe the conditions that cause a safe failure and how these conditions are sensed and corrected/masked by the "fail safe" function in the IROFS. Explain how this conforms to Section 3.1.7.J by describing the implementation of the "fail safe" capability (such as on-board diagnostics and/or condition monitoring) and the kinds of failures against which the design protects (such as random failures, circuit failures, software failures, malicious failures, etc.).

e. For IROFS involving instrumentation, provide information regarding the approach used to determine the setpoint and the measurement uncertainties. Account for all uncertainties in the measurement path, from the sensor along the signal lines through the data acquisition and data conversion components to the data processing element, as appropriate.

f. Section 3.1 states, "When failure probabilities are required for an event, Table 3.1-10, Failure Probability Index Numbers, provides the index values." Section 3.8, Table 3.8-1, provides failure probability index numbers for the IROFS. For IROFS involving instrumentation and control equipment relying upon both hardware and software, describe the process(es) (including testing, analysis, and/or industry experience) that was (were) used to establish the failure probabilities (i.e., Probabilities of Failure on Demand in Table 3.1-10 and Table 3.8-1). In the discussion, clearly explain how equipment and or processes from vendors (such as Urenco, and other third-party equipment suppliers) were evaluated by LES. Provide criteria and or data upon which values in Table 3.8-1 were based (for those IROFS involving hardware and software). Reference applicable consensus standards, if applicable.

g. The regulations, 10 CFR 70.64(a)(10), require that the design must provide for inclusion of instrumentation and control system to monitor and control the behavior of IROFS. Section 3.1.7.J in the Safety Analysis Report states, in part, "Instrumentation and control systems shall be provided to monitor variables and operating systems that are significant to safety over anticipated ranges for normal operation, for abnormal operation, for accident conditions, and for safe shutdown." Describe these instrumentation and control systems and how they meet the requirements of 10 CFR 70.64(a)(10). Include reference to codes or consensus standards, if applicable.

h. The regulations, 10 CFR 70.64(a)(4), state the design must provide for adequate protection from environmental conditions and dynamic effects associated with normal operation, maintenance, testing, and postulated accidents that could lead to loss of

safety functions. These include Electromagnetic Interference/Radio Frequency Interference, temperature, and humidity. Section 3.5.9.1, p. 3.5-43, states "field-proven designs fabricated from proven materials for intended...operating conditions are specified, as well as process instrumentation qualified for use in uranium enrichment plants." For IROFS utilizing instrumentation, describe how the design complies with 10 CFR 70.64(a)(4). Reference applicable consensus standards, if applicable.

Text removed under 10 CFR 2.390.

ISA-30 Section 3.4.3.3, p. 3.4-16

Describe the safety margins needed to assure that loads resulting from a centrifuge failure do not result in rotor debris penetration of the casing or break away of the floor mounting elements (flomels). Identification of specific industry codes or standards or operational test results is acceptable.

The regulations, 10 CFR 70.22(a)(7), require a description of the equipment and facilities which will be used to protect health and minimize danger to life or property.

Section 3.4.3.3, Design Description [Cascade System], states that the resultant loads from centrifuge failures are restrained by the casing and the floor mounting element. These components are designed so rotor debris does not penetrate the casing and the flomels do not break away from the floor.

ISA-31 Section 3.4.4, pp. 3.4-18 through 3.4-26

Provide a list of light and intermediate weight gases that could be trapped in cold traps. Are any of these gases explosive or combustible alone or in combination with other light or intermediate weight gases?

The regulation 10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property. In addition, the regulation 10 CFR 70.62(c)(1)(iii) requires that the integrated safety analysis identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

The discussion of cold traps in the product take-off system does not provide information on potentially combustible or explosive gases that might be collected in the cold traps.

ISA-32 Section 3.4.9, pp. 3.4-54 through 3.4-62; Section 4.6.1, pp. 4.6-1 through 4.6-2

Provide information related to codes and standards for GEVS design and in-place filter testing.

The regulations, 10 CFR 70.22(a)(7) require that the applicant provide a description of equipment and facilities that will be used to protect health and minimize danger to life or property.

In Section 3.4.9 of the application, the applicant indicates that a prefilter with an efficiency of 85 percent and a charcoal filter with an efficiency of 99.9 percent will be used. However, no

reference to testing standards are provided. The staff assumes the High Efficiency Particulate Air (HEPA) filter efficiency is based on removal of 0.3 micron particles and will meet the requirements of American Society of Mechanical Engineers (ASME) AG-1, “Code on Nuclear Air and Gas Treatment,” Section FC.

Section 3.4.9 indicates that gas monitors are provided to continuously monitor effluents from the GEVS. What are the sensitivities of the gamma and HF monitors?

In Sections 3.4.9 and 4.6.1 of the application, the applicant describes the ventilation program and air cleaning systems. However, reference is not made to the most current ventilation system design standards in ASME AG-1. Will filtration systems be designed in accordance with ASME AG-1?

In Section 4.6.1 of the application, the applicant states that filter inspection and testing will be performed in accordance with written procedures. A general statement referring to ASME N510, “Testing of Nuclear Air-Cleaning Systems,” is made. However, no specific information is provided on in-place filter testing frequencies or leakage efficiency goals for HEPAs or for the charcoal adsorbers.

Sections 3.4.9 and 4.6.1 of the application do not discuss temperature instrumentation downstream of the filter assemblies to detect high temperatures in the event of filter unit fires. Do temperature monitors with alarms and the capability to shut down fans exist in the system? If not, justify why this instrumentation is not included.

ISA-33 Section 3.5.1, pp. 3.5-1 through 3.5-12

Justify the lack of air effluent monitoring in areas where dispersible forms of uranium are stored or processed, which are not serviced by filtered exhaust systems with continuous monitoring.

10 CFR 20.1501 requires that surveys be made to measure the levels of radioactive material and
the potential radiological hazards.

Further, NRC Regulatory Guide 4.16, Regulatory Position C.2., states "Gaseous effluents from all operations associated with the plant, including such nonprocessing areas as laboratories, experimental areas, storage areas, and fuel element assembly areas, should be sampled. For gaseous effluents from process confinement systems and process areas where material is handled in dispersible form, a representative sample of the effluent from each stack, vent, or other point of release should be collected continually for subsequent determination of quantities and average concentrations of radionuclides released. This sampling should be conducted regardless of the concentrations of radioactive material in the effluent."

In the Environmental Report, Table 6.1-1, "Effluent Sampling Program," the applicant proposes to sample process areas only as required to complement the bioassay program. Presumably, the samplers referenced in Table 6.1-1 are those described in Section 4.8.1.2 of the Safety Analysis Report. However, these samplers would not be sufficient to permit a determination of the quantities of radionuclides and the average concentration of radionuclides being discharged from the plant.

Areas of specific concern to the staff include: (1) the Blending and Liquid Sampling Area; (2) Process Services Corridors (3 modules); (3) Link Corridors (3 modules); (4) UF6 Handling Areas (3 modules); (5) Vacuum Pump Rebuild and ME&I Workshops; (6) Chemical and Mass Spectrometry Lab and Environmental Laboratory; (7) and the Cylinder Receipt and Dispatch Building.

ISA-34 Section 3.5.1, pp. 3.5-1 through 3.5-12

Provide room volumes, room volumetric flow, and Heating Ventilating and Air Conditioning (HVAC) exhaust flow rates for each likely configuration of the HVAC systems described in Section 3.5.1 of the Safety Analysis Report.

10 CFR 70.65(b)(3) states that the ISA Summary must contain "a general description of the facility with emphasis on those areas that could affect safety."

The acceptance criteria in Standard Review Plan section 3.4.3.2(3), Processes, states that a description at a systems level is acceptable, provided that it permits the NRC reviewer to adequately evaluate (1) the completeness of the hazard and accident identification tasks and (2) the likelihood and consequences of the accidents identified.

The staff requires room volumes, room volumetric flow, and HVAC exhaust flow rates to independently evaluate the consequences of the accidents identified in the ISA Summary.

Text removed under 10 CFR 2.390.

ISA-37 Section 3.5.12.1.1.8, p. 3.5-58

Explain the means by which a representative sample is collected from the Treated Effluent Monitor Tanks.

The regulations, 10 CFR 20.1302, requires appropriate surveys and measurement to be conducted to demonstrate that dose limits are met. NRC Regulatory Guide 4.16, Regulatory Position C.2.2, states "Representative samples should be collected at each liquid release point for the subsequent determination of the quantities and average concentrations of radionuclides discharged in any liquid effluents that could reach an unrestricted area, including discharges to a sanitary sewerage system."

ISA-38 Section 3.5.12.1.4, p. 3.5-60

Describe the bookkeeping measures needed to ensure that no tank holds more than a safe mass of uranium.

10 CFR 70.61(a) requires each applicant to evaluate, in the ISA performed in accordance with §70.62, its compliance with the performance requirements in paragraphs (b), (c) and (d) of this section.

The application states that bookkeeping measures ensure that no tank holds more than a safe mass of uranium. In Section 3.5.12.1.5, the applicant states that the uranium content of tanks is important to prevent a criticality accident. None of the tanks in the collection and treatment

system are “geometrically safe” or “geometrically favorable”. Administrative controls (by mass) are applied to prevent a criticality accident. Additional information on the bookkeeping measures is needed to assess the effectiveness of this provision.

ISA-39 Section 3.5.15, pp. 3.5-79 through 3.5-81

Provide the combustion characteristics of Fomblin oil (flash point, fire point, heat of combustion, etc.)

The regulation 10 CFR 70.22(a)(7) requires the applicant to provide a description of equipment and facilities which will be used by the applicant to protect health and minimize danger to life or property. In addition, the regulation 10 CFR 70.62(c)(1)(iii) requires that the integrated safety analysis identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk.

The discussion in the Safety Analysis Report of Fomblin oil does not state that this oil is noncombustible nor does it provide any discussion of potential fire hazards presented by the oil.

Text removed under 10 CFR 2.390.

ISA-41 Section 3.7.1, Table 3.7-2 and Section 3.7.2, Table 3.7-3

Identify whether the environmental performance requirement in 10 CFR 70.61(c)(3) was met for each of the events described in the ISA Summary.

10 CFR 70.65(b)(4) requires that the ISA Summary contain information that demonstrates the licensee's compliance with the performance requirements of 10 CFR 70.61.

NRC acceptance criteria in Standard Review Plan, Section 9.4.3.2.3 states that the applicant’s ISA is acceptable if adequate engineering or administrative controls are identified for each accident sequence of environmental significance. However, in the ISA Summary, the applicant did not indicate whether the performance requirement in 10 CFR 70.61(c)(3) was met for each of the events summarized in Tables 3.7-2 and 3.7-3.

ISA-42 Sections 3.8.1 and 5.1.1 and Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify what was meant by the Sole IROFS in Table 3.8-2.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61. 10 CFR 70.65(b)(8) requires in the ISA Summary a descriptive list that identifies all items relied on for safety that are the sole item preventing or mitigating an accident sequence that exceeds the performance requirements of 10 CFR 70.61.

For example, in nuclear criticality safety, given the requirements of 10 CFR 70.65(b)(8), the commitment to the double contingency principle in Chapter 5.0, and the RAI question regarding what an IROFS is (i.e., ISA-1), it is unclear how there could be any nuclear criticality safety sole item relied on for safety.

ISA-43 Section 3.8.1, pgs. 3.8-1 - 3.8-2 and Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify why there appears to be no management measures associated with IROFS25, IROFS27, and eight other NCS IROFS.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including a description of the management measures.

All applicable management measures need to be applied to all IROFS.

ISA-44 Tables 3.7-1 and 3.7-2

Clarify whether the criticality event assumed in accident sequence EC4-2 results in an intermediate consequence to the worker.

10 CFR 70.61(a) requires each applicant to evaluate, in the ISA performed in accordance with §70.62, its compliance with the performance requirements in paragraphs (b), (c) and (d) of this section.

Table 3.7-2, Accident Sequence Descriptions, accident sequence EC4-2 states that this event is assumed to have an intermediate consequence to the worker and the public. However, Table 3.7-1, Accident Sequence and Risk Index, identifies this as a high consequence event.

ISA-45 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify whether it was your intent to rely upon the design of your facility in the license application in lieu of designating IROFS for components/equipment when evaluating accident sequences for compliance with 10 CFR 70.61.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

In the criticality analyses that were performed to support the ISA, the applicant made certain assumptions (e.g., design included favorable geometry equipment) and concluded that certain event sequences would be prevented. These assumptions related to specific systems or components that were not identified as IROFS. In addition, Table 5.1-2 lists other specific design attributes of the facility that are also not identified as IROFS. The applicant has placed these design assumptions and attributes under the Configuration Management system whereby any changes would be specifically evaluated. The staff considers that these design attributes are fundamental to the application review, and, if changes are made, in addition to the Configuration Management controls, the changes would need to be submitted for staff review in a license amendment as required under 10 CFR 70.72(c)(1)(i). Under 10 CFR 70.72(c)(1)(i), no changes to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel, without prior Commission approval, that have not been previously described in the ISA Summary.

ISA-46 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify how IROFS relate to the accident sequences, other IROFS, and management measures.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

There needs to be a clear understanding of each IROFS. For example, in nuclear criticality safety: some of the IROFS appear to be several IROFS rolled up into a single IROFS (e.g., IROFS6, IROFS9, and others); some appear to be IROFS plus management measures (e.g., IFORS6, IROFS15, and others); and some appear to be programs (e.g., IROFS16 (moderator control) and IROFS19 (mass control)).

ISA-47 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify the basis for the frequency index number (FFIN) for enhanced administrative controls and administrative controls.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

For example, in nuclear criticality safety, most active engineered controls have FFINs of -2 while most enhanced administrative controls and administrative controls have FFINs of -3, which is a more robust value. This appears to be inconsistent because one would expect an active engineered control to be more robust than either an enhanced administrative or administrative control.

ISA-48 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify what was meant by listing only a few management measures under the column 'Reliability Management Measures' in Table 3.8-1.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61, including a description of the management measures.

All applicable management measures need to be applied to all IROFS; however, there are only a few or no management measures listed for each IROFS in Table 3.8-1. The following examples are the only descriptions of the 'Reliability Management Measures' from Table 3.8-1 for nuclear criticality safety accident sequence IROFS:

> Annual Inspection - IROFS14 and IROFS17
> Annual Test - IROFS3, IROFS8, IROFS13, IROFS20, IROFS21, and IROFS22
> Annual Test, Operator Training, and Annual Refresher - IROFS9
> Operator Training and Annual Refresher - IROFS6, IROFS15, IROFS16, IROFS18, IROFS19, IROFS45 , IROFSC1, IROFSC6, IROFSC7, and IROFSC14
> Personnel Training and Annual Refresher - IROFS40
> N/A - IROFS25, IROFS29, IROFS30, IROFS31, IROFS32, IROFS33, IROFS34, and IROFS44

ISA-49 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Correct information in the tables for consistency.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

Text removed under 10 CFR 2.390.

"AC" is used to designate both administrative control and enhanced administrative control. These need to have two different designations.

ISA-50 Tables 3.7-1, 3.7-3, 3.7-4, 3.8-1 and 3.8-2

Clarify the criteria for selecting the Initiating Event Frequency (IEF) for NCS accident sequences.

10 CFR 70.65(b)(4) requires in the ISA Summary information to demonstrate compliance with the performance requirements of 10 CFR 70.61.

There needs to be a clear description of the method used for selecting the IEFs for NCS accident sequences. That method needs to be applied consistently. The method of selecting the IEFs appears to be based on the frequency of the consequences of the accident (i.e., criticality occurring) rather than on the frequency of the initiating event of the accident sequence.

Text removed under 10 CFR 2.390.

ISA-55 Table 3.7-4, pp 21. through 24

Provide a rationale for the assumed source term for scenarios FF21-2, FF23-2, and FF25-2.

The regulation 10 CFR 70.62(c)(1)(iii) requires that the ISA identifies facility hazards that could effect the safety of licensed materials and thus present an increased radiological risk. Furthermore, 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

The basis for the amount of material released is not apparent from the discussion and needs to be consistent with both operational and physical fire considerations.

ISA-56 Section 3.8.1, pp. 3.8-1 and 3.8-2

Describe how the attributes and boundaries of each IROFS will be identified to plant personnel, including operations, maintenance, and engineering, once final design is completed (i.e., define how appropriate information concerning IROFS will "flowdown" to the plant staff).

10 CFR 70.62(c)(1)(vi) requires each applicant to conduct and maintain an ISA of appropriate detail for the complexity of the process, that identifies for each IROFS, the characteristics of its

preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied on to support compliance with the performance requirements of 10 CFR 70.61.

Section 3.8.1, IROFS, states that management measures will ensure that IROFS are designed, implemented and maintained, as necessary, to be available and reliable to perform their safety functions when needed. Information related to IROFS hardware design details, identification of essential utilities, operating ranges and limits, etc., will be available onsite in the ISA documentation, once final design is complete. Table 3.8-1, Items Relied on for Safety (IROFS), describes the IROFS safety function and reliability management measures.

Text removed under 10 CFR 2.390.

ISA-58 Table 3.8-1, pp. 10, 11, and of 14

Provide a definition of an “enhanced “ administrative IROFS. Confirm that any enhanced administrative controls will be captured in written procedures. Also, provide definitions of “passive engineered controls,” “active engineered controls,” and “administrative controls.”

The regulation 70.61(e) requires that each engineered or administrative control or control system necessary to comply with the performance requirements of section 10 CFR 70.61 be designated as an item relied on for safety. In addition, 70.65(b)(6) requires that the ISA summary contain a list briefly describing each IROFS that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

For example, IROFS36 is often referred to as an “enhanced” administrative IROFS by the applicant and assigned a failure probability index of -3. What is the difference between an administrative control and an enhanced administrative IROFS as used by the applicant?

Text removed under 10 CFR 2.390.

ISA-59 Table 3.8-1, p. 12 of 14

Define the term “independent verification.”

10 CFR 70.62(c)(1)(vi) requires each applicant to conduct and maintain an ISA of appropriate detail for the complexity of the process, that identifies for each IROFS, the characteristics of its preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied on to support compliance with the performance requirements of 10 CFR 70.61.

Text removed under 10 CFR 2.390.

ISA-62 Table 3.8-1

Provide the technical basis for demonstrating that administrative control IROFs will meet the performance requirements of 10 CFR 70.61.

The regulations in 10 CFR 70.61 and 70.62 require that an applicant perform an ISA of the hazards associated with the proposed facility and demonstrate compliance with the performance requirements in10 CFR 70.61(b), (c), and (d).

Table 3.8-1 lists approximately fifteen (15) additional administrative control IROFS not designated as Class A. While these are not classified as sole IROFS, the applicant needs to demonstrate that it can meet the performance requirements in 10 CFR 70.61 with administrative controls. The applicant needs to provide an improved technical basis.

ISA-63 Table 3.8-1, pp. 10 of 14 through 11 of 14; Table 3.7-4, pp. 12 of 29 through 29 of 29

Provide a comprehensive description of how the applicable attributes of IROFS36 provide a prevention or mitigation role in the sequences in which they are used. In addition, discuss how design margin and surveillances are incorporated into combustible loading controls to achieve the desired reliability.

The regulation 10 CFR 70.65(b)(6) requires that the ISA summary contain a list briefly describing each item relied upon for safety that is identified pursuant to 10 CFR 70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of 10 CFR 70.61.

In Table 3.7-4, IROFS36 is used in a number of different fire accident sequences but it is not clear, in many cases, what attribute is being credited and why it is being credited.

Text removed under 10 CFR 2.390.

Chapter 4.0 Radiation Protection

RP-1 Section 4.1, pp. 4.1-1

Please explain the applicant's intent to comply with 20.1101(d).

Applicants must provide a radiation protection program that is adequate to protect the radiological health and safety of workers and members of the public in accordance with 10 CFR Part 20.

In Section 4.1 of the application, the applicant states that the radiation protection program meets the requirements of 10 CFR 20, Subpart B - Radiation Protection Programs. The applicant goes on to further outline its commitment to 10 CFR 20.1101(a-c), however, no specific information is provided with respect to 10 CFR 20.1101(d).

RP-2 Section 4.4.1, pp. 4.4-1

Please explain the qualifications for a "radiation specialist."

Applicants must provide a radiation protection program that is adequate to protect the radiological health and safety of workers and members of the public in accordance with 10 CFR Part 20 and 10 CFR 70.22(a)(6).

In section 4.4.1 of the application, the applicant states that, at a minimum, the Radiation Work Permit requires approval by a staff member who is a radiation specialist, however, there is no discussion of the qualifications of a "radiation specialist."

Chapter 5.0 Nuclear Criticality Safety

NCS-1 Section 5, General

For each process or equipment component that has Special Nuclear Material (SNM) associated with it, identify the amount, type, and location of fissionable material that will be present.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

The locations and descriptions of SNM to be used in the facility are needed to assess hazards.

NCS-2 Section 5.0, General

Clarify if you intend to commit to using the American Nuclear Society (ANS)-8 series of national standards for NCS that are applicable to the proposed facility or provide specific justifications for using alternative approaches.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

In Chapter 5.0, there needs to be a clear commitment to the requirements and recommendations of the appropriate ANS-8 series of national standards for NCS or justifications for using alternative approaches (e.g., there is no reference to ANS-8.22, "NCS Based on Limiting and Controlling Moderators" and ANS-8.23, "Nuclear Criticality Accident Emergency Planning and Response). The latest versions of the standards should be committed to (e.g., the application refers to ANS-8.1-1983, "NCS in Operations with Fissionable Materials Outside Reactors" instead of the most recent 1998 version). If no alternative approaches are provided, then the commitment needs to be to all the requirements and recommendations in the standards, rather than to some of the requirements and recommendations in the standards (e.g., Section 2.3.3 does not commit to all the requirements and recommendations of ANS-8.19, "Administrative Practices for NCS" and ANS-8.20, "NCS Training"). For guidance only, see NUREG-1520 Sections 5.4 through 5.4.2.

NCS-3 Section 5.1.1, p. 5.1-1; and Section 5.2.1.3.2, p. 5.2-3

Provide in Sections 5.1.1 and 5.2.1.3.2 a discussion of the 1.5 wt.% U-235 control limit on enrichment for the Contingency Dump System.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.

10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

A discussion of the 1.5 weight percent U-235 enrichment control limit for the Contingency Dump System is needed. Sections 5.1.1 and 5.2.1.3.2 describe an enrichment control limit of 5.0 weight percent U-235. However, the Contingency Dump System has an enrichment control limit of 1.5 weight percent U-235.

NCS-4 Sections 5.2, pgs. 5.2-1 - 5.2-5; 5.4, pgs. 5.4-1 - 5.4-3; and 5.3.16, pgs. 5.3-12 - 5.3-13

Clarify that the safety program in Chapter 5.0 includes all the programmatic commitments and descriptions of how to meet the commitments for the NCS program.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

For example, moderator control and mass control appear to be used but are not described in Section 5.4. For guidance only, see Chapter 5.0 of NUREG-1520 with emphasis on Sections 5.4.3.4.1, 5.4.3.4.2, and 5.4.3.4.4.

NCS-5 Section 5.2.1, p. 5.2-1

Clarify that the MONK8A code used for NCS calculations will be controlled under the Quality Assurance Program Description.

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application. 10 CFR 70.65(d) requires the establishment of management measures to ensure compliance with performance requirements of 10 CFR 70.61.

NCS computer codes need to be controlled under the Quality Assurance Program to ensure that results are reliable and computer codes properly documented.

NCS-6 Section 5.4, General

Provide a discussion of criticality prevention using “enhanced administrative controls.”

10 CFR 70.62(a) requires the establishment and maintenance of a safety program to demonstrate compliance with the performance requirements of 10 CFR 70.61.
10 CFR 70.65(a) requires a description of this safety program to be submitted in the license application.

Sections 5.4.1, 5.4.2, and 5.4.3 provide discussions of criticality prevention using passive engineered controls, active engineered controls, and administrative controls. A discussion of criticality prevention using enhanced administrative controls is needed.

Chapter 6.0 Chemical Process Safety

Text removed under 10 CFR 2.390.

CS-3 Table 6.3-5

Provide a rational basis for adjusting acute chemical release limits through the use of a time-weighted average (TWA) method, and confirm that the proposed Acute Exposure Guideline Level (AEGL) values are based on the latest published figures.

10 CFR 70.65 (b)(7) requires that the ISA Summary contain a description of the proposed quantitative standards used to assess the consequences to an individual from acute chemical exposure to licensed material or chemicals produced from licensed materials.

Table 6.3-5, Enhanced Definition of Consequence Severity Categories, represents enhanced derived values as extrapolated from the HF and UF_6 (as soluble uranium) AEGLs. The table utilizes a 1-minute and 5-minute acute chemical exposure time for a local worker and a worker in the room, respectively, and a 30-minute exposure time for outside the controlled area. NUREG-1520, Section 6.4.3.1, Process Chemical Risk and Accident Sequences, notes that acute chemical release limits may not be adjusted by a TWA calculation unless a rational basis is provided in the ISA Summary. Use of an approach endorsed by an internationally recognized committee, such as contained in the National Academy of Sciences latest revision to the AEGLs (2004) would be acceptable.

Chapter 7.0 Fire Safety

Text removed under 10 CFR 2.390.

Chapter 10.0 Decommissioning

D-1 Section 10.1.3, pp. 10.1-1 and 10.1-2

Provide the increased level of detail described in NUREG-1757, Volume 3, for the decommissioning cost estimate.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" provides the information and acceptance criteria that should be used in both developing and evaluating the decommissioning cost estimate. Appendix A, Section A.3.1, "Preparing the Site Specific Cost Estimate," provides specific guidance on the information to be included in the cost estimate for the staff to be able to make a finding regarding the adequacy of the cost estimate, and reasonable assurance regarding funding to support decommissioning.

The applicant's cost estimate for the facility is a summary of the decommissioning costs and is presented in Table 10.1-1, "Total Decommissioning Costs," and does not include the supporting basis for how the applicant arrived at the summary estimates for each activity. For the staff to

evaluate the decommissioning cost estimate, the applicant needs to provide the level of detail described to NUREG-1757, Volume 3, Section A.3.1.

D-2 Section 10.1.3, pp. 10.1-1 and 10.1.2

Provide a thorough justification for using a contingency factor less than 25 percent.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" has recommended a contingency factor of 25 percent.

The applicant is using a contingency factor of 10 percent and has based the reduced factor on past experience. While the staff agrees that a contingency factor lower than 25 percent may be warranted based on past experience at similar facilities, the applicant needs to provide a stronger supporting basis for a reduced contingency, and although a reduced contingency may be warranted, the staff believes 10 percent may not be sufficient. In addition, the staff believes that the contingency factor needs to be applied across the board, and includes applying the contingency factor to the cost of the tails disposition (also see Comment D-4).

D-3 Section 10.2.1, p. 10.2-1

Provide an unexecuted copy of the surety mechanism for decommissioning financial assurance.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. Decommissioning funding plans include a certification that financial assurance for decommissioning has been provided in the amount of a site-specific cost estimate and a signed original of the financial assurance instrument used. Under "Consolidated NMSS Decommissioning Guidance," NUREG-1757, it is acceptable to provide the executed surety instruments prior to the commencement of licensed activities or receipt of licensed material.

An unexecuted copy of the financial assurance instrument proposed to be used by the applicant needs to be reviewed to ensure that it meets the requirements in 10 CFR 70.25.

D-4 Section 10.3, pp. 10.3-1 through 10.3-3

Provide a contingency factor for the processing and disposal of depleted uranium. Also, provide copies of the four reports used to prepare the tails disposition cost estimates.

The regulations in 10 CFR 70.25 require applicants for a uranium enrichment facility to have decommissioning funding plans. Decommissioning funding plans include a certification that financial assurance for decommissioning has been provided in the amount of a site-specific cost estimate and a signed original of the financial assurance instrument used.

NUREG-1757, Volume 3, "Consolidated NMSS Decommissioning Guidance," specifically Chapter 4, Section 4.1, "Cost Estimate (As Contained in a Decommissioning Funding Plan or Decommissioning Plan)" has recommended a contingency factor of 25 percent. Chapter 10.3 estimates 132,942 MT of depleted uranium will be generated over the thirty-year life of the

facility. The cost of waste processing and disposal cost for the depleted uranium is estimated to be $5.50 per MTU resulting in a total cost of $731,181,000. The cost was based on a comparison of four studies which were developed between 1993 and 2002 and the earlier studies were escalated to 2002 dollars. The cost for disposal of the depleted uranium varied significantly. Because the disposition of the depleted uranium may not take place for more than 30 years, and due to the uncertainty in the studies, LES needs to include a contingency factor in the estimated costs of disposition of the depleted uranium.

In Section 10.3, the applicant has prepared a cost estimate using four references. The staff needs these cost estimate references to evaluate the cost estimate basis.

Chapter 11.0 Management Measures

MM-1 Section 11.1, p. 11.1-1 through 11.1-12

Describe the Configuration Management (CM) process and controls that are in place during design, license application review, construction, and operation to assure that the design, engineering, procurement, and construction drawings and documents and the ISA are consistent and current.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1 states that the ISA will be under the CM program, but additional clarification of the design/procurement/construction and ISA interfaces and how the design basis is controlled and assured is needed to clarify the management measure adequacy in this area.

MM-2 Section 11.1.1, p. 11.1-1

Clarify what selective documentation is controlled by the CM program. Please amplify the scope of the selective documentation or identify documentation types that will be under the CM program and provide specific examples of documents that would not be under the CM program.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1.1.1 states that selective documentation is controlled under the CM program, but does not identify the documents, other than the ISA.

MM-3 Section 11.1.1.1, p. 11.1-3

Confirm that the scope of structures, systems, and components (SSC) under CM includes all SSCs and each change to them, and not just IROFS, and any items which may affect the function of the IROFS.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

Section 11.1.1.1 states that the scope of the SSCs under CM includes IROFS and any items which may affect the function of the IROFS.

MM-4 Section 11.1.5, p. 11.1-12

Confirm a commitment to ensuring comprehensive program oversight through audits and assessments of the CM program, initially and at least once every year in accordance with the Quality Assurance Program Description (QAPD) and Quality Assurance (QA) procedure requirements.

10 CFR 70.72(a) requires that the licensee shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel.

The LES QAPD, Revision 0, Section 18, requires audits at least once per year, but does not address if the schedule will be adjusted annually upon evaluation based on an assessment of the applicable QA program elements. Section 11.1.5 states that periodic audits and assessments will be performed of the CM program, but does not identify a frequency.

Text removed under 10 CFR 2.390.