April 30, 2008

Mr. Dealis W. Gwyn, Licensing Manager
Shaw AREVA MOX Services
P.O. Box 7097
Aiken, SC 29804-7097

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE REVIEW OF THE CRITICALITY SAFETY ASPECTS OF THE MIXED OXIDE FUEL FABRICATION FACILITY LICENSE APPLICATION REQUEST

Dear Mr. Gwyn:

We have reviewed the criticality safety related information in your license application (LA) submittal, dated September 27, 2006. The submittal requests a license, to possess and use, special nuclear, source, and by-product material in the Mixed Oxide Fuel Fabrication Facility (MFFF). The MFFF, which is to be located on the Department of Energy's Savannah River site in Aiken, South Carolina, will process and fabricate mixed oxide fuel for use in commercial nuclear power plants as part of the plutonium disposition program.

We have enclosed a listing of additional information that is needed by the staff in order to complete the review of the criticality safety aspects of the MFFF. Note that additional requests for additional information (RAI) for criticality safety will be forthcoming, following the completion of our review of the Integrated Safety Analyses Summary. Please provide us with a summary document relating how our questions were addressed and any other changes to other licensing documents that may have been necessary to incorporate the responses (e.g., LA change pages). The revisions should be provided within 90 days of the date of this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS).

ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If you have any questions, we would be happy to meet with you and other Shaw AREVA MOX Services staff on these issues. Please contact me at (301) 492-3229.

Sincerely,

/RA/

David Tiktinsky, Senior Project Manager
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure: RAI

Docket: 70-3098

cc:
G. Smith, NNSA
J. Olencz, DOE
S. Jenkins, SC Dept. Of HEC
D. Curran, Esq., NWS
D. McIntyre, OPA
A.J. Eggenberger, DNFSB
L. Zeller, BREDL
G. Carroll, NWS
D. Silverman, Esq.
D. Gywn, MOX Services

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Mixed Oxide Fuel Fabrication Facility–Licensing Review
Request for Additional Information
Nuclear Criticality Safety

License Application

Section numbers refer to sections of the license application.

Section 6.1, "Organization and Administration for Nuclear Criticality Safety (NCS)"

NCS-1

Clarify who has the authority to make commitments to The U.S. Nuclear Regulatory Commission (NRC) and who has accountability for the overall safety of the Mixed Oxide Fuel Fabrication Facility (MFFF).

10 CFR 70.62(a) states: "Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61." NUREG-1718, Section 6.4.3.1.C, states: "…the staff reports to the safety manager and is independent of operations at the highest practical level, preferably to an official at a sufficiently high level to have the authority to make commitments to the NRC and have accountability for the overall safety of the facility." It is not clear from License Application (LA) Section 6.1 who has this authority and accountability. This information is needed for regulatory clarity.

NCS-2

Clarify LA Section 6.1 regarding the NCS organization. The NCS function is described as part of the MFFF organization in LA Section 6.1, but this is not clear from the description in LA Section 4.2.5. Also, LA Section 6.1 states the following: "The NCS organization, which reports to the manager of the support services function, is responsible for implementing applicable NCS practices for the MFFF," which seems to imply that there is a support services function manager.

10 CFR 70.62(a) states: "Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61." NUREG-1718, Section 6.4.3.1.C, states: "…the staff reports to the safety manager and is independent of operations at the highest practical level, preferably to an official at a sufficiently high level to have the authority to make commitments to the NRC and have accountability for the overall safety of the facility." It is not clear from LA Section 6.1 who the NCS staff reports to (i.e., the NCS function manager or the support services function manager). This information is needed for regulatory clarity.

Enclosure

Section 6.2.2, “Audits and Assessments”

NCS-3

. Provide a commitment to audit the NCS program at least quarterly such that all NCS aspects of management measures are audited at least every 2 years, or in the alternative, provide a commitment to use a justification on the basis of risk, such as based on the results of the Integrated Safety Analysis (ISA), to determine a frequency for audits.

10 CFR 70.62(a) states: “Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61.” NUREG-1718, Section 6.4.3.2.C.iv, states: “The applicant commits to conducting and documenting periodic NCS audits. A less than quarterly frequency may be justified on the basis of risk, such as based on the results of the ISA.” It is not clear from LA Section 6.2.2 that there is a commitment to use a risk-informed methodology determination to determine the frequency of audits if less than a quarterly frequency is performed. This information is needed for regulatory clarity.

NCS-4

. Provide a commitment to conduct and document weekly walkthroughs of all operating special nuclear material (SNM) process areas, or in the alternative, provide a commitment to use a justification on the basis of risk, such as based on the results of the ISA, to determine a frequency for walkthroughs.

10 CFR 70.62(a) states: “Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61.” NUREG-1718, Section 6.4.3.2.C.iv, states: “The applicant commits to conduct and document periodic walkthroughs of all operating [SNM] process areas. … A less than weekly frequency may be justified on the basis of risk, such as based on the results of the ISA.” It is not clear from LA Section 6.2.2 that there is a commitment to use a risk-informed methodology determination to determine the frequency of walkthroughs if less than a weekly frequency is performed. This information is needed for regulatory clarity.

Section 6.2.3, “Procedures”

NCS-5

Provide a commitment to review procedures and their implementation at least annually to ascertain that procedures are being followed and that process conditions have not been altered to adversely affect NCS, or in the alternative, provide a commitment to use a justification on the basis of risk, such as based on the results of the ISA, to determine a frequency for procedure review.

10 CFR 70.62(a) states: "Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61." NUREG-1718, Section 6.4.3.2.C.ii, states: "Operations are reviewed at least annually to ascertain that procedures are being followed and that process conditions have not been altered to adversely affect NCS." It is not clear from LA Section 6.2.3 that there is a commitment to use a risk-informed methodology determination to determine the frequency of procedures reviews if less than an annual frequency is performed. This information is needed for regulatory clarity.

Section 6.3, "Nuclear Incident Monitoring System"

NCS-6

Provide a commitment to have an alarm for the nuclear incident monitoring system that is clearly audible in areas that must be evacuated or that provides alternative notification methods that are documented to be effective in notifying personnel when evacuation is necessary.

10 CFR 70.24(a) states: "Each licensee authorized to possess special nuclear material in a quantity exceeding 700 grams of contained uranium-235, 520 grams of uranium-233, 450 grams of plutonium, 1,500 grams of contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of either paragraph (a)(1) or (a)(2), as appropriate, and using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." It is not clear from LA Section 6.3 that there is a commitment to have a nuclear incident monitoring system that is clearly audible if an accidental criticality occurs. This information is needed to ensure the alarm for the nuclear incident monitoring system is adequate.

NCS-7

Provide a commitment to immediately render operations safe, by shutdown and quarantine if necessary, in any area where nuclear incident monitoring system coverage has been lost, until compensatory measures approved by the nuclear criticality safety function are in place or the alarm service has been restored. In the alternative, provide a commitment to specify the number of hours on a process-by-process basis before rendering operations safe.

10 CFR 70.24(a) states: "Each licensee authorized to possess special nuclear material in a quantity exceeding 700 grams of contained uranium-235, 520 grams of uranium-233, 450 grams of plutonium, 1,500 grams of contained uranium-235 if no uranium enriched to more than 4 percent by weight of uranium-235 is present, 450 grams of any combination thereof, or one-half such quantities if massive moderators or reflectors made of graphite, heavy water or beryllium may be present, shall maintain in each area in which such licensed special nuclear material is handled, used, or stored, a monitoring system meeting the requirements of either paragraph (a)(1) or (a)(2), as appropriate, and using gamma- or neutron-sensitive radiation detectors which will energize clearly audible alarm signals if accidental criticality occurs." It is not clear from LA Section 6.3 that there is a commitment to specify the number of hours on a process-by-process basis before rendering operations safe. This information is needed for regulatory clarity.

Section 6.4.1, "Nuclear Criticality Safety Evaluations (NCSE)"

NCS-8

Clarify what MFFF "components or systems" require development of an NCSE (i.e., the threshold for requiring an analysis). LA Section 6.4.1 states that "When an MFFF component or system is designed or modified, an NCSE is developed or updated to determine that the entire process will be subcritical...."

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical". NUREG-1718, Section 6.4.3.3.2, states: "Critically Safety Evaluations (CSEs) should be considered the main source of information regarding the adequacy of criticality controls. CSEs are the documents used to develop the safety basis of facility operations." The applicant has committed to develop NCSEs to document subcriticality of facility operations, but it is not clear whether there is a threshold for when an NCSE is required. This information is needed for regulatory clarity.

NCS-9

Provide a commitment that NCSEs will only be performed by qualified NCS Engineers or qualified Senior NCS Engineers. The duties of a qualified NCS Engineer of Senior NCS Engineer in LA Section 6.1.1 include having the "responsibility and authority" to conduct activities assigned to the NCS Function, but the license application does not appear to require that only qualified NCS Engineers or Senior NCS Engineers are permitted to perform NCSEs.

10 CFR 70.62(a) states: "Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61." NUREG-1718, Section 6.4.3.1, states:

"To provide for NCS, the applicant's organization and administration implementing the safety program in 10 CFR 70.62(a) should be considered acceptable if the applicant has met the following acceptance criteria…(A)…the applicant has described organizational positions, functional responsibilities, experience, and adequate qualifications of persons responsible for NCS." There is no unequivocal statement in the license application that describes who is qualified to perform criticality analysis. This information is needed to provide assurance of the adequacy of the NCS Program.

NCS-10

Provide a commitment that NCSEs will be peer reviewed by a qualified Senior NCS Engineer or NCS Manager prior to approval. Describe the NCSE approval process.

10 CFR 70.62(a) states: "Each licensee or applicant shall establish and maintain a safety program that demonstrates compliance with the performance requirements of §70.61." NUREG-1718, Section 6.4.3.1, states: "To provide for NCS, the applicant's organization and administration implementing the safety program in 10 CFR 70.62(a) should be considered acceptable if the applicant has met the following acceptance criteria…(B) The applicant commits to the endorsed requirements related to organization and administration in ANSI/ANS-8.1-1983…Where similar requirements also exist in ANSI/ANS-8.19-1996…the applicant commits to follow the more detailed requirements of ANSI/ANS-8.19-1996". ANSI/ANS-8.19-1996, Section 8.4, states "Before the start of operation, there shall be an independent assessment that confirms the adequacy of the nuclear criticality safety evaluation." Also, NUREG-1718, Section 6.3.3(F), states: "The commitment to prepare and maintain applicable safety basis documentation in enough detail so that criticality controls and double contingency analysis can be reviewed and inspected by NRC and licensee staff." This information is needed to provide assurance of the adequacy of the NCS Program.

NCS-11

Revise your statement that "The evaluation may include criticality calculations using validated calculational methodologies to demonstrate that both normal and credible abnormal conditions meet the required minimum margin of subcriticality," by replacing the underlined words with "are subcritical, including the required minimum margin of subcriticality." The purpose of performing calculations is to demonstrate subcriticality; this is done by comparing calculated results to an Upper Subcritical Limit (USL) that accounts for bias, bias uncertainty, *and* the minimum margin of subcriticality. Thus the minimum margin of subcriticality is only *part of* a subcriticality demonstration.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical," including use of an approved margin of subcriticality for safety." Criticality calculations are performed to demonstrate subcriticality, which includes but is not limited to consideration of an approved margin of subcriticality."

This information is needed to ensure processes are adequately subcritical.

Section 6.4.2, "Analytical Methodology"

NCS-12

State why Section 6.4.2 commits to American National Standards Institute's (ANSI) and American Nuclear Society's (ANS)-8.1-1983 (R1988), instead of the newer ANSI/ANS-8.1-1998. Revise your application to provide consistent references to this standard. Some references are given as "ANSI/ANS-8.1-1983 (R1988)," some as "ANSI/ANS-8.1-1983," and some just as "ANSI/ANS-8.1." Those references listed as "ANSI/ANS-8.1," in particular, should be changed because there is no version number associated with them.

NUREG-1718, Section 6.4.2, states: "Regulatory Guide (RG) 3.71…endorses the ANSI/ANS 8 national standards as listed below in part or in full: ANSI/ANS-81-1983 (Reaffirmed in 1988), "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors." It is NRC practice to endorse specific versions of such standards. Use of other than the currently endorsed version should be justified. This information is needed for regulatory consistency.

NCS-13

Elaborate on your statement: "The evaluations of the assumptions are based on realistic processes; conservative assumptions are analytically qualified so as to demonstrate the level of conservatism added." Explain what the underlined words mean, and provide an example of what this evaluation would entail.

The meaning of these words is unclear. This information is needed for regulatory clarity.

NCS-14

Explain the logical relationship between the two halves of your statement: "Defense-in-depth practices are incorporated in the MFFF, such as the preferential selection of first passive engineered control, secondly active engineered controls, and then administrative controls, where practical." While defense-in-depth and a preferred control hierarchy are both desirable, it does not appear that the preferred control hierarchy should be listed as an example of defense-in-depth practices.

10 CFR 70.64(b) states: "Facility and system design and facility layout must be based on defense-in-depth practices. The design must incorporate, to the extent practicable: (1) Preference for the selection of engineered controls over administrative controls to

increase overall system reliability". NUREG-1718, Section 6.4.3.3.2(C), states: "The applicant commits to the preferred use of passive-engineered controls to ensure NCS. The applicant should commit to the following preference, in general, for controls to ensure NCS: (1) passive-engineered, (2) active-engineered, (3) augmented-administrative, and (4) simple-administrative."

However, the relationship between defense-in-depth practices and the preferred control hierarchy is not clear. This information is needed for regulatory clarity.

NCS-15

Add the acceptance criterion to the bulleted list in LA Section 6.4.2 that optimum or worst-credible conditions will be assumed for parameters unless they are specifically controlled (or state where such a commitment can be found).

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." With regard to the evaluation of process conditions, NUREG-1718, Section 6.4.3.3.1(F), states "The applicant commits to assuming credible optimum conditions (i.e., most reactive conditions physically possible) for each controlled parameter unless specific controls are implemented to limit the controlled parameter to a certain range of values." This information is needed to ensure processes are adequately subcritical.

NCS-16

Clarify your commitment that "Items Relied on For Safety (IROFS) associated with maintaining these controlled parameters are noted in the NCSE." State whether all NCS controls needed to meet the double contingency principle or ensure subcriticality will be IROFS. If not, explain when this statement will be applied.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." 10 CFR 70.61(e) states: "Each engineered or administrative control or control system necessary to comply with paragraphs (b), (c), or (d) of this section shall be designated as an item relied on for safety." However, it is not the NRC's position that all controls relied on to meet the double contingency principle, which is required in 10 CFR 70.64(a)(9), be designated as IROFS (see FCSS-ISG-03 for a detailed discussion of this). Therefore, it is necessary to clarify the intent of the statement in the license application. This information is needed for regulatory clarity.

NCS-17

Explain your statement that "Evaluations based on <u>realistic component parameters</u> are performed to demonstrate that controlled parameters are maintained during both normal and credible abnormal conditions." In particular, explain the meaning of the underlined words and provide an example. Also, explain the statement that controlled parameters will be maintained during credible abnormal conditions. Abnormal conditions normally

involve the loss of controlled parameters.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2(E), states: "The applicant commits to describing controlled parameters for each process used as NCS control." NUREG-1718, Section 6.8, defines "abnormal condition" as "…A condition that can only be reached by exceeding the safety limits of a controlled parameter but that is planned for in CSEs." The phrase "realistic component parameters," and the statement that controlled parameters will be maintained during credible abnormal conditions, is unclear. This information is needed for regulatory clarity.

NCS-18

Explain your statement that "Evaluations based on realistic component parameters are performed to demonstrate that controlled parameters are maintained during both normal and credible abnormal conditions. Summaries of these evaluations are provided in the NCSEs." If summaries of the aforementioned evaluations are contained in NCSEs, are the actual evaluations maintained as separate documents? Where?

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.0, states: "Tolerances on the controlled parameters should be conservatively taken into account in setting operating limits and controls established to prevent exceeding subcritical values of parameters." Evaluations (and not just summaries of these evaluations) are necessary to determine that controlled parameters will be maintained. This information is needed to ensure processes are adequately subcritical.

Section 6.4.3, "Additional Technical Practices"

NCS-19

Explain the underlined words in the following: "...that properly accounts for method bias, including appropriate processes, and uncertainty and administrative margin." It is not clear what these words mean or what they have to do with method bias.

The meaning of these words is unclear. This information is needed for regulatory clarity.

Section 6.4.4, "Criticality Control Modes"

NCS-20

Remove the word "initially" from your statement: "Reliance is initially placed on equipment design using passive engineered controls, rather than administrative controls, where practical." The preference for passive over active and administrative controls should apply to both the initial facility design and future changes.

10 CFR 70.64(b) states: "The design must incorporate, to the extent practicable:

(1) Preference for the selection of engineered over administrative controls to increase overall system reliability". NUREG-1718, Section 6.4.3.3.2(C), states: "The applicant commits to the preferred use of passive-engineered controls to ensure NCS.

The applicant should commit to the following preference, in general, for controls to ensure NCS: (1) passive-engineered, (2) active-engineered, (3) augmented-administrative, and (4) simple-administrative." This information is needed for assurance that IROFS will be adequately reliable.

NCS-21

Provide a commitment to demonstrate your adherence to the hierarchical preference of control (i.e., passive over active over administrative control; passive geometry control) as part of facility design. One way to demonstrate this is through a commitment to justify deviations from the preferred design hierarchy in the ISA, preferably in facility NCSEs.

10 CFR 70.64(b) states: "The design must incorporate, to the extent practicable: (1) Preference for the selection of engineered over administrative controls to increase overall system reliability". NUREG-1718, Section 6.4.3.3.2(C), states: "The applicant should demonstrate how it is meeting this commitment to the preferred design approach [preference for passive over active or administrative controls], such as by providing justification when using other than passive-engineered control. This demonstration should also be documented in the ISA." NUREG-1718, Section 6.4.3.3.2.0, states: "The applicant should demonstrate how it is meeting this commitment [preference for geometry control], such as by providing justification when using other than passive geometry for criticality control." This information is needed for assurance that IROFS will be adequately reliable.

NCS-22

Explain your statement "Controlled parameters and techniques for controlling associated modes...are established and justified." Explain where this justification is documented.

10 CFR 70.64(b) states: "The design must incorporate, to the extent practicable: (1) Preference for the selection of engineered over administrative controls to increase overall system reliability". NUREG-1718, Section 6.4.3.3.2(C), states: "The applicant should demonstrate how it is meeting this commitment to the preferred design approach [preference for passive over active or administrative controls], such as by providing justification when using other than passive-engineered control. This demonstration should also be documented in the ISA." NUREG-1718, Section 6.4.3.3.2.0, states: "The applicant should demonstrate how it is meeting this commitment [preference for geometry control], such as by providing justification when using other than passive geometry for criticality control." It is unclear where this justification is to be documented. This information is needed for regulatory clarity.

Section 6.4.4.1, "Geometry Control"

Note that parallel language occurs in multiple sections corresponding to different controlled parameters. Where a question pertains to more than one parameter, it is listed under the first parameter to which the question applies (but other affected parameters are noted).

N.B. The list of affected parameters may not be comprehensive. The attempt to identify all parameters to which the question may apply notwithstanding, the applicant should review the sections for all other parameters to ensure that any changes that may be necessary in other sections are also made.

NCS-23

Revise your statement that "Geometry parameters are established..." to read "Geometry limits are established...". In standard criticality terminology, geometry is considered a "parameter" and the specific values associated with that parameter are termed "limits."

Also, 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," and state whether these will be based on effective neutron multiplication factor (k_{eff}) sensitivity studies and the ability of controls to maintain operating limits.

This question also applies to the other parameters.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.4(D), states: "The applicant commits to determining operation limits for controlled parameters, such that there is an adequate margin of safety to ensure the subcritical limit will not be exceeded. The applicant should commit to performing studies of the sensitivity of k_{eff} to variations in the parameters. The margin of safety should be based on these sensitivity studies and the ability of the control to maintain the operating limits." While the aforementioned statement in Section 6.4.4.1 satisfies the first sentence of the acceptance criterion, it does not address the use of sensitivity studies to ensure those limits are appropriate. This information is needed to ensure that processes are adequately subcritical.

NCS-24

Explain the reason for differences in your commitments to establish margins sufficient to account for uncertainties and variability, for the various parameters. In particular, staff notes the following differences in terminology:

Geometry, Isotopics, Moderation: "including margins to protect against uncertainties in process variables and against limits being accidentally exceeded"

Mass, Density: "including margins to protect against uncertainties in process variables and against limits being inadvertently exceeded"

Reflection, Interaction, Neutron Absorber, Heterogeneity, Physicochemical Control: no corresponding commitment

Concentration, Volume: "including margins to protect against uncertainties in process variables"

Verify that there is no intended difference between "accidentally" and "inadvertently." Explain why five parameters (not including process variable control, which indirectly places limits on other parameters) do not have a corresponding commitment. Explain why the phrase "and against limits being accidentally/inadvertently exceeded" has been dropped from the sections on concentration and volume control. Furthermore, explain how adequate margins will be determined (e.g., through sensitivity studies).

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.4(D), states: "The applicant commits to determining operation limits for controlled parameters, such that there is an adequate margin of safety to ensure the subcritical limit will not be exceeded." This information is needed to ensure that processes are adequately subcritical.

NCS-25

State how margin in geometry limits will be determined when standards or handbooks are used to determine subcriticality.

This question also applies to density control.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical". NUREG-1718, Section 6.4.3.3.2.2(C), states "When using large single units, conservative margins of safety (such as 90% of the minimum critical cylinder diameter, 85% of the minimum critical slab thickness, and 75% of the minimum critical sphere volume) are used. Justification should be provided for proposed alternatives to these limits, taking system sensitivities into account....Reliance on engineering judgement does not substitute for this justification." These commitments are not necessary when relying on calculational methods for which bias and uncertainty have been determined by validation and an acceptable subcritical margin in k_{eff} applied. However, when subcriticality is determined by other means, the method of determining subcritical margin should be described. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.2, “Mass Control”

NCS-26

Revise your commitment that “When process variables can affect the bounding weight percent of SNM in the mixture, the SSCs or procedures that affect the process variables are evaluated” to state “...are controlled as IROFS in the NCSEs and ISA Summary.”

This question also applies to heterogeneity control.

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical”. NUREG-1718, Section 6.4.3.3.2.1(A), states: “When process variables can affect the bounding weight percent of SNM in the mixture, controls to maintain the process variables are identified as IROFS in the CSEs and ISA Summary.” This information is needed to ensure that processes are adequately subcritical.

NCS-27

Clarify the underlined words in your statement: “Theoretical densities for fissile mixtures are used, unless lower densities are ensured, or data are available.” State that any data used for this purpose must be justified to be applicable and reliable in NCSEs.

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” NUREG-1718, Section 6.4.3.3.2.1(B), states: “Theoretical densities for fissile mixtures are used unless lower densities are ensured by the establishment of NCS controls.” It does not contain this provision for relying on historical data for less than theoretical density. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.4, “Isotopic Control”

NCS-28

Explain your statement: “In addition, the determination of isotopic content is based on compliance with the double contingency principle.” Does this mean that when less than the bounding isotopic abundance is assumed (96wt% ^{239}Pu and 93.2wt% ^{235}U), it will be based on two independent isotopic measurements?

This question also applies to moderation control.

The meaning of these words is unclear. This information is needed for regulatory clarity.

NCS-29

Clarify your statement: “Consideration is given to sample analysis and verification activities associated with MFFF and vendor Department of Energy (DOE)-supplied measurements. DOE, Pit Disassembly and Conversion Facility (PDCF), and vendor data are qualified in accordance with an approved QA plan and are audited by the MFFF QA function. The use of qualified nondestructive assay (NDA) measurement systems is also acceptable in establishing compliance with the double contingency principle.” Add a commitment that vendor data alone will not be used to determine isotopic content, but must be confirmed by MFFF measurements. NUREG-1718, Section 6.4.3.3.2.4(A), states: “...determinations of isotopic content shall be based on dual independent sampling and analysis of each lot of fissile material.”

This question also applies to moderation control. (For moderation, if reliance is to be placed solely on vendor data, provide justification that moderation levels will not change during transportation and storage.)

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” NUREG-1718, Section 6.4.3.3.2.4(B), states: “When physical measurement of the isotopics is needed, the measurement is obtained by using instrumentation subject to facility quality assurance measures as specified in 10 CFR 70.22(f).” How control will be exercised over measurements of isotopic and moisture content without confirmatory measurement at the MFFF is not apparent. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.5, “Reflection Control”

NCS-30

Explain what conditions constitute loss of reflection control. While the discussion in this section appear to involve the presence of mainly hydrogenous materials around the boundaries of fissile material units, ISA Summary Section 5.3.7.2.37, “Purification Unit Criticality Controlled Parameter, (KPA) ” discusses loss of reflection control as follows:

Loss of reflection control could occur due to leak of a process material achieving an unsafe volume and greater reflector proximity to equipment in any glovebox drip tray or process cell drip tray.

Also, in ISA Summary Table 5.3.7-61, accident sequence KPA-10 is described (under the heading “Volume and Reflection Events” as:

> There is a leak of solution that could provide additional reflection of fissile bearing process equipment.

The leakage of fissile solutions is typically considered a loss of geometry control, and a decrease in the distance between fissile units a loss of interaction control. Reflection is normally considered an effect of non-fissile bearing materials. It is therefore necessary to explain what is meant by reflection control, versus geometry, interaction, or volume.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718 Sections 6.4.3.3.2.1 through 6.4.3.3.2.12 contain acceptance criteria for use of each of the twelve different controlled parameters. This information is needed to ensure that the criteria that must be met for each of the controlled parameters is appropriate.

NCS-31

Explain what is meant by "sufficient water reflection" in your statement: "Sufficient water reflection is conservatively used in evaluations to simulate potential personnel and/or other transient reflectors." Explain why no minimum reflector conditions are specified.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." Construction Authorization Request (CAR) Section 6.3.3.2.5, stated: "At a minimum, reflection conditions equivalent to 1-in (2.5-cm) tight-fitting water jacket are assumed to account for personnel and other transient incidental reflectors not evaluated in the unreflected models." NUREG-1718, Section 6.4.3.3.2.5, contains the same language. This information is needed to ensure that processes are adequately subcritical.

NCS-32

Add the phrase "12-in (30-cm) tight-fitting water jacket" to your statement: "In cases where reflection control is not indicated, water reflection of process stations or fissile units is represented by a tight-fitting water jacket...".

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." CAR Section 6.3.3.2.5 contained the 12-in thickness, as does NUREG-1718, Section 6.4.3.3.2.5(D). This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.6, "Moderation Control"

NCS-33

Explain your statement: "Moderation control is used in MFFF design applications where the process function is not compatible with a worst-case SNM moderator content (i.e., optimum moderation) or process/storage area flooding assumption." In particular:

a. Staff assumes that this means that the system will be evaluated to determine if it is subcritical under an optimum moderation or full flooding assumption; if it cannot be shown to be subcritical, then moderation controls will be established. Is this what is meant by "not compatible?" If this understanding is correct:

b. Explain the sense in which the word "or" is meant. Does this mean that an evaluation of both optimum and full flooding conditions must be done, or is an evaluation of either condition sufficient? Optimum moderation may not occur at full flooding conditions.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.1(F) states: "The applicant commits to assuming credible optimum conditions (i.e., most reactive conditions physically possible) for each controlled parameter unless specified controls are implemented to limit the controlled parameter to a certain range of values." This information is needed to ensure that processes are adequately subcritical.

NCS-34

Add the phrase "...in NCSEs and the ISA Summary" to your statement "When process variables can affect moderation, the SSCs or procedures that affect those process variables are identified as IROFS."

This question also applies to concentration and heterogeneity control.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.6(B), states: "When process variables can affect the moderation, controls to maintain the process variables are identified as IROFS in the CSEs and ISA Summary." While the license application states that these items will be identified as IROFS, it does not state where this will be documented. This information is needed for regulatory clarity.

NCS-35

Explain your statements "the sampling program is based on compliance with the double contingency principle" and "The sampling process incorporates independent verification as part of the sampling and analysis program." Does placing this under this bullet imply that sampling will always be done to determine moderator content (when the amount of moderator is controlled)? What about the statement that "consideration will be given to sampling analysis and verification..."? Will dual independent sampling and analysis be used, or only independent verification? If not, of what does "independent verification" consist?

This question also applies to concentration control ("independent verification sampling methods").

10 CFR 70.64(a)(9) states: "The design must provide for criticality control including adherence to the double contingency principle." NUREG-1718, Section 6.4.3.3.2.6(E) states: "When sampling of the moderator is needed, the sampling program uses dual independent sampling and analysis methods." The information is needed to ensure compliance with the double contingency principle.

NCS-36

Explain how competing fire and criticality risks will be managed in determining what fire protection systems may be used. You state "The effects of credible fire events and the consequences associated with the potential use of moderating material in mitigating such fires are evaluated, as applicable." However, it is not clear how the results of this evaluation are used.

NUREG-1718, Section 6.4.3.3.2.6(G), states "The ISA may weigh the competing risks from criticality accidents and fires and determine that the overall risk to the worker and the public is minimized by allowing the use of water." CAR Section 6.3.3.2.6 stated in addition that "in the MFFF moderation-controlled areas, hydrogenous fire-fighting materials are not allowed". This information is needed to ensure that both fire and criticality risks are adequately addressed.

Section 6.4.4.7, "Concentration Control"

NCS-37

Clarify that concentration-based single-parameter limits are based on conservative (full) reflection in addition to conservative (spherical) geometry. Single-parameter limits are generally determined assuming all other parameters are at their worst-case values.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.1(F), states: "The applicant commits to assuming credible optimum conditions (i.e., most reactive conditions physically possible) for each controlled parameter unless specified controls are implemented to limit the controlled parameter to a certain range of values." For single-parameter limits, this means that all other parameters are evaluated at their worst-case credible conditions. This information is needed to ensure that processes are adequately subcritical.

NCS-38

Add the phrase "so that a single operator cannot defeat the control mechanism" to your statement "When using a tank containing concentration-controlled solution, access to the tank is controlled."

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.7(C), states: "When using a tank containing concentration-controlled solution, the tank is normally closed and locked. Access should be controlled to ensure that a single operator cannot defeat the control mechanism." This information is needed to ensure that processes are adequately subcritical.

NCS-39

State whether sampling alone may be relied on to meet the double contingency principle when concentration control is the only means of ensuring subcriticality in unfavorable geometry equipment. If so, justify reliance on sampling alone and clarify requirements for sampling (e.g., dual independent sampling and analysis, independent verification).

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical". NUREG-1718, "Section 6.4.3.3.2.7(E) states: "In such cases, due to the difficulties involved with dual sampling, another means (such as an in-line monitor) should be used in conjunction with dual sampling to provide reasonable assurance of safety." This information is needed to ensure that processes are adequately subcritical.

NCS-40

Describe what surveillance will be performed to verify that over-concentration has not occurred (in concentration-controlled processes).

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.7(G), discusses identification and control of mechanisms leading to over-concentration (as in your application), but also states "Surveillance is provided to ensure the effectiveness of these controls. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.8, "Interaction Control"

NCS-41

Describe whether passive engineered devices for interaction control will be periodically inspected for deformation.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.8(A), states, in addition to the commitments in your application, that "if the engineered devices are part of the structure of the unit (such as moveable birdcage drums) or subjected to significant mechanical stresses, they should be periodically inspected for deformation. This information is needed to ensure that processes are adequately subcritical.

NCS-42

Describe whether visual indicators and/or postings are used when interaction is procedurally controlled.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.8(B), states, "Unit spacing is controlled by rigorous procedures (if the spacing is identified in workstation procedures with visual

indicators and postings). This should include visible guides (such as painted lines and postings)." This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.10, "Volume Control"

NCS-43

Specify either to what percentage of the minimum critical volume will be limited, or how this percentage will be determined.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.10(C), includes this acceptance criterion, but a verbatim restatement of the criterion is not enough to demonstrate adequacy. When it states that "some percentage" should be used, either that percentage or the method of determining it should be described. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.11, "Heterogeneity Control"

NCS-44

Commit that assumptions about the physical scale of heterogeneity are based on the observed physical characteristics of the material, and appropriately controlled, and that modeled conditions are at least as reactive as suggested by the physical data.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.2.11(C), states: "Assumptions about the physical scale of heterogeneity (as used in computer calculations) are based on the observed physical characteristics of the material, and appropriately controlled." This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.12, "Physicochemical Control"

NCS-45

Commit that when process variables can affect the physicochemical form, controls to maintain it are identified as IROFS in the NCSEs and ISA Summary.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." While there is no corresponding acceptance criterion in NUREG-1520, there is a similar criterion for other parameters and the same principle should hold. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.4.13, “Process Variable Control”

NCS-46

Provide examples of the type(s) of conditions that may be considered “process variable control.” The license application does not describe what “process conditions” may be credited or what “bounding normal operational tolerances on process parameters and upset conditions” means.

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” NUREG-1520, Section 6.4.3.3.2.12, describes examples such as furnace temperature credited in excluding moderation, mechanical forces credited in limiting density, and the effect of background radiation on mass measurement. Indicate if this is consistent with your understanding of what “process variable control” is. This information is needed for regulatory clarity.

Section 6.4.5.2, “Regulatory Requirements, Guidance, and Industry Standards”

NCS-47

Clarify your commitment to only use validated computer methods, and the document the results in a validation report. The license application has the unusual verbiage “Industry standards note that a validation report is developed...” without explicitly stating that only validated methods will be used and the results documented in a report

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” NUREG-1718, Section 6.4.3.3.1(C) states: “the applicant has, at the facility, a documented, reviewed, and approved validation report (by NCS and management) for each methodology that will be used to make an NCS determination”. If a commitment to this effect is intended, it is not clear. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-48

Clarify for what types of methods validation is required. The license application does not specify this information.

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” NUREG-1718, Section 6.4.3.3.1(C), states that validation will be done for “each methodology that will be used to make an NCS determination (e.g., experimental data, reference books, hand calculations, deterministic computer codes, probabilistic computer codes).” This information is needed to ensure that processes are adequately subcritical.

Section 6.4.5.3, “Criticality Code Validation Methodology”

NCS-49

State what information must be described in the documented, reviewed, and approved validation report.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.1(c), states that the validation report should contain the information in paragraphs (i) through (vii). Specifically, state that the documented, reviewed, and approved validation report should contain the information in paragraphs (i), (iii), (iv), (v), and (vi) of this section. (Note that the area(s) of applicability and the software/hardware to be used are described in the license application, so that items (ii) and (vii) do not need to be addressed.) This information is needed to ensure that processes are adequately subcritical.

Section 6.4.5.5, "Summary of USL for Each Area(s) of Applicability (AOA)"

NCS-50

With regard to Table 6.4-1 of the license application, revise the descriptions of AOA(1), AOA(4), and AOA(5) to what was reviewed and approved at the CAR stage (NUREG-1821, Tables 6.1-1, 6.1-5, and 6.1-6, or justify why the AOAs described in Table 6.4-1 of the license application are broader than what was reviewed and approved. Specifically, Table 6.4-1 does not describe limitations on the thickness and composition of cadmium and borated concrete in AOA(1) and AOA(5), and does not describe restrictions in H/(U+Pu) and EALF for AOA(4) due to outstanding questions about the applicability of certain benchmark experiments.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." NUREG-1718, Section 6.4.3.3.1(C), states: "The validation report should contain the following…(ii) A description of the AOA that identifies the range of values for which valid results have been obtained for the parameters used in the methodology." The validation was reviewed in detail during the CAR review. If any changes are needed for the current licensing review, they should be justified. This information is needed to ensure that processes are adequately subcritical.

Section 6.4.6, "Implementation of NCS in the ISA"

NCS-51

Explain the following statement: "Where practical, nuclear criticality is precluded by demonstrating that the design is subcritical without the need to implement controls." Provide an example of this, and explain why those design features that maintain subcritical conditions need not be identified as controls.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by

assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." 10 CFR 70.61(e) states: "Each engineered or administrative control or control system necessary to comply with paragraphs (b), (c), or (d) of this section shall be designated as an item relied on for safety."

This statement would appear to contradict the requirements of 10 CFR 70.61(e). This information is needed to ensure that controls relied on to meet the performance requirements are identified as IROFS.

NCS-52

Explain what is meant by the following two statements: (1) "In those cases in which it is not possible to demonstrate that a criticality is not credible, criticality control parameters are selected and limits on these parameters are established." (2) "Passive engineered, active engineered, and administrative criticality safety controls relied on to meet double contingency ensure that a criticality cannot occur under credible conditions." The first statement seems to suggest that criticality controls are only established when criticality cannot be shown to be "not credible," while the second seems to suggest that it is the criticality controls that make criticality "not credible." These statements appear to be inconsistent.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." 10 CFR 70.61(e) states: "Each engineered or administrative control or control system necessary to comply with paragraphs (b), (c), or (d) of this section shall be designated as an item relied on for safety." The two statements appear to be inconsistent, and the second appears to contradict 10 CFR 70.61(e). This information is needed to ensure that controls relied on to meet the performance requirements are identified as IROFS.

NCS-53

Clarify the following statement: "MFFF design and safety features are NCS calculations and NCSEs that are documented, controlled, and maintained by implementing the management measures described in Chapter 15."

Design and safety features are normally understood to encompass structures, systems, and components, relied on for safety, and not calculations or analyses. The usage of this term in this sentence appears to be inappropriate. This information is needed for regulatory clarity.

Section 6.5, “Regulatory Guidance Applicability”

NCS-54

Clarify whether MFFF intends to adhere to the exception from Regulatory Guide 3.71 for Section 4.3.6 of ANSI/ANS-8.1-1998, “Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors.” LA Section 6.5 does not mention this exception in its clarification for ANSI/ANS-8.1. Also, clarify whether MFFF intends to adhere to the 1998 version of ANSI/ANS-8.1 as specified in Regulatory Guide 3.71.

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.” Regulatory Guide 3.71 states the following exception for ANSI/ANS-8.1-1998: an “applicant should provide the details of validation (as stated in Section 4.3.6 of the standard) to (1) demonstrate the adequacy of the margins of subcriticality relative to the bias and criticality parameters, (2) demonstrate that the calculations embrace the range of variables to which the method will be applied, and (3) demonstrate the trends in the bias upon which the licensee or applicant will base the extension of the area of applicability. In addition, the details of validation should state computer codes used, operations, recipes for choosing code options (where applicable), cross-section sets, and any numerical parameters necessary to describe the input.” If a commitment to this effect is intended, it is not clear. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-55

Clarify whether MFFF intends to adhere to the exceptions from Regulatory Guide 3.71 for ANSI/ANS-8.3-1997, “Criticality Accident Alarm System.” LA Section 6.5 does not explicitly mention this exception in its clarification for ANSI/ANS-8.3 (i.e., LA Section 6.5 states that MFFF operations comply with the “corresponding guidance in Regulatory Guide 3.71.”

10 CFR 70.61(d) states: “the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical”. Regulatory Guide 3.71 states the following with regard to ANSI/ANS-8.3-1997: “The guidance on criticality accident alarm systems, as specified in ANSI/ANS-8.3-1997 (reaffirmed in 2003), is generally acceptable to the NRC staff. An exception is that 10 CFR 70.24, “Criticality Accident Requirements,” requires criticality alarm systems in each area in which special nuclear material is handled, used, or stored, whereas Section 4.2.1 of the standard merely requires an evaluation for such areas. Another exception is that 10 CFR 70.24 and 10 CFR 76.89, “Criticality Accident Requirements,” require that each area must be covered by two detectors, whereas Section 4.4.1 of the standard permits coverage by a single reliable detector. Finally, 10 CFR 70.24 and 10 CFR 76.89 require a monitoring system capable of detecting a nuclear criticality that produces an absorbed dose in soft tissue of 20 rads of combined neutron and gamma radiation at an unshielded distance of 2 meters from the reacting material within 1 minute.”

If a commitment to this effect is intended for these exceptions, it is not clear. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-56

Clarify whether MFFF intends to adhere to the exception from Regulatory Guide 3.71 for ANSI/ANS-8.17-1984, "Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors," on burnup credit. LA Section 6.5 does not mention this exception in its clarification for ANSI/ANS-8.17.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." Regulatory Guide 3.71 states the following exception for ANSI/ANS-8.17-2004: "licensees and applicants may take credit for fuel burnup only when the amount of burnup is confirmed by physical measurements that are appropriate for each type of fuel assembly in the environment in which it is to be stored." If a commitment to this effect is intended, it is not clear. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-57

Explain the reason for the additional clarification for ANSI/ANS-8.17, which is stated in LA Section 6.5 as the following: "This commitment is considered applicable to process, material handling, or storage area designs where a criticality event has been determined to be credible."

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-58

Clarify whether MFFF intends to adhere to the version of the standards endorsed in Regulatory Guide 3.71. For example, in LA Section 6.5, MFFF commits to ANSI/ANS-8.7-1975, "Nuclear Criticality Safety in the Storage of Fissile Materials." However, ANSI/ANS-8.7-1998 is the version of the standard endorsed in Regulatory Guide 3.71. Also, MFFF commits to ANSI/ANS-8.19-1996, "Administrative Practices for Nuclear Criticality Safety." However, ANSI/ANS-8.19-2005 is the version of the standard endorsed in Regulatory Guide 3.71. As an additional example, MFFF commits to ANSI/ANS-8.17-1984, "Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors." However, ANSI/ANS-8.17-2004 is the version of the standard endorsed in Regulatory Guide 3.71. Finally, as stated previously, ANSI/ANS-8.1-1998 is the version of the standard endorsed in Regulatory Guide 3.71, but MFFF commits to the 1983 version of the standard.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." ANSI/ANS-8.1, ANSI/ANS-8.7, ANSI/ANS-8.17, and ANSI/ANS-8.19 have all been revised with additional requirements that have been endorsed by Regulatory Guide 3.71. However, MFFF commits to earlier versions of these standards that do not have these additional requirements. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-59

Clarify the statement: "may be used if the need arises," which was used in the clarifications for ANSI/ANS-8.7 and ANSI/ANS-8.12 in LA Section 6.5, since it implies that should operations that involve these standards be implemented at a later date, there is no commitment to follow these standards.

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." It is unclear whether MFFF has committed to ANSI/ANS-8.7 and ANSI/ANS-8.12. This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.

NCS-60

Explain the reason for the exception to Section 4.1.7 of ANSI/ANS-8.22, which is stated in LA Section 6.5 as the following: "The design of MFFF fissile material storage areas has been reviewed, and administrative controls limiting the introduction of combustible materials during operation applied to ensure that an acceptable combustible loading is maintained. Fire protection provisions (i.e., fire suppression) in areas where fissile material is processed, handled, or stored are documented and justified."

10 CFR 70.61(d) states: "the risk of nuclear criticality accidents must be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical." This information is needed for regulatory clarity and to ensure that processes are adequately subcritical.