

September 13, 2002

Joseph D. Ziegler, Acting Assistant Manager  
Office of Licensing and Regulatory Compliance  
U.S. Department of Energy  
Yucca Mountain Site Characterization Office  
P.O. Box 364629  
North Las Vegas, NV 89036-8629

SUBJECT: CONTAINER LIFE AND SOURCE TERM AGREEMENTS 5.06 AND 5.07

Dear Mr. Ziegler:

During a Technical Exchange and Management Meeting held on October 23-24, 2000, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) reached agreement on criticality issues within the Radionuclide Transport (RT), Evolution of the Near-Field Environment (ENFE), and Container Life and Source Term (CLST) Key Technical Issues (KTIs). By letter dated July 29, 2002, DOE provided information to address CLST Agreements 5.06 and 5.07. The NRC staff has reviewed this information as it relates to the agreements and the results of the staff's review are enclosed.

In summary, based on the remaining CLST Subissue 5 agreements which DOE still needs to address and the regulatory requirements outlined in 10 CFR 63.114(d), the NRC staff agrees that CLST Agreements 5.06 and 5.07 can be closed and that criticality consequence analyses only need to be performed if the probability of criticality is above the regulatory threshold. Therefore, CLST Agreements 5.06 and 5.07 are "complete."

In addition, DOE's July 29, 2002, letter also addressed General Agreement 1.01 (#21 and 64) which references CLST Agreement 5.06. The NRC staff believes the information provided by DOE in its July 29, 2002, letter, satisfactorily addresses the issues outlined in Items #21 and 64 that relate to CLST Agreement 5.06. If you have any questions regarding this matter, please contact Mr. James Andersen of my staff. He can be reached at (301) 415-5717.

Sincerely,  
/RA/

Janet Schlueter, Chief  
High-Level Waste Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated  
cc: See attached distribution list

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Letter to J.Ziegler from J.Schlueter dated September 13, 2002

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C. Meyers, Moapa Paiute Indian Tribe

V. Miller, Fort Independence Indian Tribe

A. Bacock, Big Pine Paiute Tribe of  
the Owens Valley

R. Quintero, Inter-Tribal Council of Nevada  
(Chairman, Walker River Paiute Tribe)

M. Bengochia, Bishop Paiute Indian Tribe

J. Egan, Egan & Associates, PLLC

J. Leeds, Las Vegas Indian Center

K. Tilges, Citizen Alert

J. Triechel, Nuclear Waste Task Force

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W. Briggs, Ross, Dixon & Bell

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## NRC Review of DOE Documents Pertaining to Key Technical Issue Agreements

The U.S. Nuclear Regulatory Commission (NRC) goal of issue resolution during the pre-licensing period is to assure that the U.S. Department of Energy (DOE) has assembled enough information on a given issue for NRC to accept a license application for review. Resolution by the NRC staff during pre-licensing does not prevent anyone from raising any issue for NRC consideration during the licensing proceedings. Also, and just as important, resolution by the NRC staff during pre-licensing does not prejudge what the NRC staff evaluation of that issue will be after its licensing review. Issues are resolved by the NRC staff during pre-licensing when the staff has no further questions or comments about how DOE is addressing an issue. Pertinent new information could raise new questions or comments on a previously resolved issue.

This enclosure addresses three NRC/DOE agreements. Container Life and Source Term Agreements (CLST) 5.06 and 5.07 were made during the Criticality Technical Exchange and Management Meeting on October 23-24, 2000 (see NRC letter dated October 27, 2000, which summarized the meeting). General Agreement 1.01 (#21 and 64) was made during a Technical Exchange and Management Meeting held on September 18-19, 2001 (see NRC letter dated October 2, 2001, for meeting summary). By letter dated July 29, 2002, DOE submitted information to address all three agreements. The document submitted and associated Key Technical Issue (KTI) agreements are discussed below:

### Wording of Agreements

CLST Agreement 5.06:

Provide a "what-if" analysis to evaluate the impact of an early criticality assuming a waste package failure. DOE stated that it would provide the requested analyses prior to LA [license application]. Actual schedule to be provided pending DOE planning process.

CLST Agreement 5.07:

Provide sensitivity analyses that will include the most significant probability/consequence criticality scenarios. DOE stated that it would provide the requested analyses prior to LA. Actual schedule to be provided pending DOE planning process.

General Agreement 1.01 (Issue #21):

NRC Concern:

The basis for screening criticality from the postclosure performance assessment is contained in a DOE AMR [Analysis and Model Report], "Features, Events, and Processes-System Level and Criticality" that references a document "Probability of Criticality Before 10,000 years." This screening argument relies upon the conclusion that failure of waste packages due to corrosion is not credible during the 10,000 year compliance period. However, analysis in the SSPA [Supplemental Science and Performance Analyses] indicate that early failure of the waste package is credible due to the possibility of improper heat treatment of the closure welds. Therefore, there isn't a sufficient basis to screen criticality from the TSPA [total system performance assessment] calculations. There are [no] models to evaluate the consequences of a criticality event in the TSPA.

Enclosure

General Agreement 1.01 (Issue #64):

NRC Concern:

Criticality has been screened from the SSPA, without an appropriate technical basis. Basis: The DOE screening argument in the System Level and Criticality FEPs [Features, Events, and Processes] AMR was based on the conclusion that no waste packages would fail in the first 10,000 years except as a result of igneous events. The SSPA identifies the possibility of early waste package failure due to improper heat treatment of the closure lid, but does not provide an appropriate screening argument for criticality given this failure.

DOE Response to Both Issues (the portion that relates to CLST Agreement 5.06):

The "What-If" criticality evaluation, per KTI Agreement CLST 5.06, will follow the Topical Report methodology after assuming an early waste package failure.

NRC Review of Agreements: In response to all three agreements, DOE provided a letter report entitled, "Agreements CLST 5.06 and 5.07," dated July 2002. This material was sent under a DOE cover letter dated July 29, 2002. In the cover letter, DOE stated that consistent with the methodology documented in the Disposal Criticality Analysis Methodology Topical Report (Criticality Topical Report) (YMP/TR-004Q, Revision 01), it plans to address CLST Agreements 5.06 and 5.07 by demonstrating that the probability of criticality is below the regulatory threshold and that based on 10 CFR 63.114(d), consequence evaluation of criticality can be screened out in the same manner as other low probability events. DOE also stated that the letter report addresses the two NRC issues discussed in General Agreement 1.01.

The NRC staff agrees that 10 CFR Part 63 only requires DOE to consider events that have at least one chance in 10,000 of occurring over 10,000 years. Therefore, if DOE can show that the probability of criticality is below this threshold, criticality can be screened out and consequence analyses do not need to be performed. CLST Agreement 5.03 requests that DOE provide the technical basis for screening criticality from the post-closure performance assessment. It is the NRC staff's understanding that the technical basis is currently scheduled to be provided to the NRC in Fiscal Year 2004. In addition, CLST Agreement 5.01 (as well as Radionuclide Transport Agreement 4.01 and Evolution of the Near-Field Environment Agreement 5.01) request the Revision 01 to the Criticality Topical Report, which includes the methodology for calculating the probability of criticality. DOE submitted Revision 01 to the Criticality Topical Report on February 21, 2001, and the NRC staff review of the document is currently on hold awaiting additional DOE submittals, including information on the methodology for calculating the probability of criticality. The Criticality Topical Report will provide the overall methodology DOE will use to evaluate the potential for post-closure criticality.

Based on the remaining agreements which DOE still needs to address and the regulatory requirements outlined in 10 CFR 63.114(d), the NRC staff agrees that CLST Agreements 5.06 and 5.07 can be closed and that criticality consequence analyses only need to be performed if the probability of criticality is above the regulatory threshold.

The NRC staff notes, however, that in the letter report, DOE states that based on preliminary scoping evaluations documented in Appendix J of the Technical Update Impact Letter Report, it expects that criticality events will be screened from the performance assessments based on low probability. The NRC staff has expressed reservations about the approach used in Appendix J of the Technical Update Impact Letter Report on several occasions. In response to those NRC reservations, DOE has stated that the NRC staff should disregard Appendix J of the report and

to not review the details. DOE has further stated that it plans to use the methodology documented in the Criticality Topical Report for determining the probability of criticality. The NRC staff continues to have questions on the methodology for determining the probability of criticality and awaits DOE additional Criticality Topical Report submittals.

With respect to General Agreement 1.01, during the Technical Exchange and Management Meeting held on September 18-19, 2001, DOE proposed that NRC Concern #21 and 64 be addressed in multiple agreements (e.g., CLST Agreements 1.01, 1.02, 1.09, 1.11, 5.03, and 5.06; Total System Performance Assessment and Integration Agreement 3.03; and Pre-Closure Agreements 7.04 and 7.05). As discussed above, based on the remaining agreements which DOE still needs to address and the regulatory requirements outlined in 10 CFR 63.114(d), the NRC staff agrees that the portion of General Agreement 1.01 (#21 and 64) that references CLST Agreement 5.06 can be closed.

In summary, based on the regulatory requirements specified in 10 CFR 63.114(d) and the remaining open agreements, CLST Agreements 5.06 and 5.07 can be listed as complete. In addition, General Agreement 1.01 (#21 and 64) regarding the "what-if" criticality analysis is complete. The NRC staff notes that with DOE solely relying on the probability argument at this time and not performing any consequence analyses, the requirements for presenting a complete and thorough methodology, analyses, and validation for total criticality probability in the license application takes significant importance.

Additional Information Needed: None at this time.

Status of Agreement: Container Life and Source Term Agreements 5.06 and 5.07 are complete.