



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
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May 1, 2017

MEMORANDUM TO: Gregory Suber, Chief  
Low-Level Waste Branch  
Division of Decommissioning, Uranium Recovery,  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

FROM: Harry Felsher, Sr. Project Manager */RA/*  
Low-Level Waste Branch  
Division of Decommissioning, Uranium Recovery,  
and Waste Programs  
Office of Nuclear Material Safety  
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SUBJECT: SUMMARY OF FEBRUARY 28, 2017, TECHNICAL  
TELECONFERENCE CALL RELATED TO REVIEW OF SAVANNAH  
RIVER SITE SALTSTONE DISPOSAL FACILITY FISCAL YEAR 2014  
SPECIAL ANALYSIS DOCUMENT (DOCKET NO. PROJ0734)

On February 28, 2017, the U.S. Nuclear Regulatory Commission (NRC) held a technical teleconference call (telecon) with the U.S. Department of Energy (DOE), which included the DOE contractors, related to the NRC review of the DOE Savannah River Site Saltstone Disposal Facility (SDF) Fiscal Year (FY) 2014 Special Analysis Document. Please see below for the highlights of that telecon and see the Enclosure for a technical summary of that telecon.

During the January 26, 2017, NRC Management/DOE Management discussion at the Savannah River Site (SRS), NRC Management/DOE Management agreed that the NRC staff/DOE staff would continue to work together and more specifically jointly develop a plan to address the issues related to iodine (I) and technetium (Tc) release from saltstone. The February 28, 2017, technical telecon was the first technical telecon related to jointly developing that plan. The highlights of that telecon were the following:

Enclosure: Technical Summary of February 28, 2017, Technical Teleconference Call

cc: (w/Enclosure): WIR Service List  
WIR External e-Mail Contacts List  
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Prior to the telecon:

- The DOE explained to the NRC the roles of DOE-Headquarters (HQ) staff in the NRC/DOE waste incidental to reprocessing (WIR) activities under the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA).
- The DOE explained that, with the recent DOE-HQ re-organization, some DOE-HQ staff had not been involved for most of the more than 10 years of the NDAA WIR program.
- The DOE provided the NRC with the following two documents, which are available in the NRC's Agencywide Documents Access and Management System (ADAMS):
  - *DOE Slides of SRS Salt Waste Disposal Highlights and Timeline of NDAA 3116 Interactions* [ADAMS Accession No. ML17059D499]
  - *SRR-CWDA-2017-00027, Rev. 0, DOE Chart of Path to Closure of NRC Type-IV Letter* [ADAMS Accession No. ML17059D497]

The telecon began with NRC staff/DOE staff (including DOE contractors) introductions. Afterwards, the NRC staff/DOE staff discussed many general and specific topics beyond the issue of Tc/I release from saltstone, including:

- The NRC staff/DOE staff views on some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern.
- The status of some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern.
- The separate NRC staff acknowledgement and DOE staff acknowledgement that significant progress had been made towards resolution of some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern since the Letter was issued.

In summary, based on the NRC staff/DOE staff discussion during this telecon, there is:

- Mutual understanding of some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern (e.g., Model Design, Hydraulic Conductivity, Technetium Release).
- Mutual understanding that none of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern had been completely addressed at the time of this telecon; but, the NRC would soon close out some monitoring factors in the 2013 SDF Monitoring Plan related to one of the technical concerns that led to the Letter.
- Mutual understanding that the DOE has made significant progress towards resolution of some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern since the Letter was issued.

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TELECONFERENCE CALL RELATED TO REVIEW OF SAVANNAH  
RIVER SITE SALTSTONE DISPOSAL FACILITY FISCAL YEAR 2014  
SPECIAL ANALYSIS DOCUMENT (DOCKET NO. PROJ0734) –  
**[DOCUMENT DATE]**

Enclosure: Technical Summary of February 28, 2017, Technical Teleconference Call

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WIR External e-Mail Contacts List  
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**TECHNICAL SUMMARY OF FEBRUARY 28, 2017, TECHNICAL TELECONFERENCE CALL  
RELATED TO REVIEW OF SAVANNAH RIVER SITE  
SALTSTONE DISPOSAL FACILITY FISCAL YEAR 2014 SPECIAL ANALYSIS DOCUMENT**

The purpose of this technical teleconference call (telecon) between the U.S. Nuclear Regulatory Commission (NRC) staff and the U.S. Department of Energy (DOE) staff (including DOE contractors) was to discuss the development of a joint NRC/DOE plan related to iodine (I) and technetium (Tc) release from saltstone at the Savannah River Site (SRS) Saltstone Disposal Facility (SDF).

The first topic discussed during the telecon was related to some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern for the SRS SDF.

The NRC asked the DOE if the technical concerns that led to the 2012 NRC Type-IV Letter of Concern were understood. In its initial response, the DOE indicated that it appeared that, since 2012, the NRC had expanded the technical concerns beyond the technical concerns that led to the Letter. For example, the DOE indicated that iodine release was not mentioned in the Letter. In response, the NRC clarified that:

- Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for 2005 (NDAA) requires the NRC to monitor, in coordination with the NDAA Covered State, the DOE disposal actions related to waste incidental to reprocessing (WIR).
- The NRC currently implements its NDAA Section 3116(b) monitoring responsibility at the SDF using Revision 1 of the NRC SDF Monitoring Plan (dated September 2013) [available in the NRC's Agencywide Documents Access and Management System (ADAMS) as Accession No. ML13100A113].
- The NRC monitoring activities at the SDF since 2012 have not been solely focused on the technical concerns that led to the 2012 NRC Type-IV Letter of Concern.
- The NRC clarified that the genesis of the 2012 NRC Type-IV Letter of Concern was more than just that the NRC did not conclude with reasonable assurance in the NRC 2012 SDF Technical Evaluation Report (TER) that the DOE would meet one of the Title 10 *Code of Federal Regulations* (10 CFR) Part 61 performance objectives (POs).
- *For additional clarity, the NRC is providing more detail in this telecon summary:*
  - The NRC has been monitoring the DOE disposal actions at the SDF since 2005.
  - By 2012, the NRC had identified Open Issues under Revision 0 of the NRC SDF Monitoring Plan.
  - Several of those Open Issues had been open for many years before issuance of the 2012 NRC Type-IV Letter of Concern.
  - Those Open Issues were part of the reason why the NRC issued the NRC Type-IV Letter of Concern.

- The technical concerns related to two of those Open Issues were related to: (1) Tc and (2) the potential differences between conditions of laboratory simulated saltstone vs. conditions of field-emplaced saltstone
- For example, over the years, the NRC and the DOE discussed the need for the DOE: (1) to reduce the uncertainty in the modeled timing of Tc release and (2) to provide the basis that laboratory samples of saltstone were representative of field-emplaced saltstone.
- The NRC clarified that the topics that the NRC is interested in during monitoring may change over time based on what a DOE model takes credit for because: (1) a DOE model; (2) the DOE assumptions about a DOE model; or (3) the importance of those assumptions about a DOE model could change over time.
  - For example, if the DOE intends to use best estimate degradation, then that means that support for the modeling assumptions about degradation would become even more important and the NRC would focus more on degradation during monitoring.
  - For example, as recently identified by the DOE during testing of field-emplaced Saltstone Disposal Structure 2A cores, I release is now more important for the DOE to meet a PO.
    - I release had not been specifically discussed in the NRC Type-IV Letter, partially because the DOE projected dose due to I release at that time was lower than what is now being calculated.
    - That means that, as described in Revision 1 of the SDF Monitoring Plan, the NRC could expand an existing monitoring factor or open a new monitoring factor in the next revision of the SDF Monitoring Plan.
    - *For additional clarity, the NRC is providing more detail in this telecon summary:*
      - Page 3-3 in Revision 1 of the SDF Monitoring Plan under Monitoring Area 1 (Inventory) includes: “Although a risk-informed NRC review is expected to focus on the radionuclides that were identified as potentially risk-significant (i.e., Tc-99, I-129, Ra-226, Se-79, the ancestors of Ra-226), NRC staff will review the inventory of the other radionuclides to confirm that they are not present at risk-significant levels.” *Note that the previous list does include Iodine.*

There has not been any expansion by the NRC of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern and the DOE acknowledged that fact during the telecon.

The DOE indicated that the recent DOE interest in the 2012 NRC Type-IV Letter was due mainly to the upcoming start of Salt Waste Processing Facility (SWFP) operations that is designed for higher cesium waste feed, which will likely translate in higher concentrations of Tc and I in the SDF waste stream. The DOE indicated that the NRC clarifications based on more recent information since the 2012 SDF TER will be helpful in DOE decisions related to authorizing SDF operations during SWPF operations, which are expected to start in Fiscal Year

(FY) 2019, and to the DOE operating contractor when planning salt batches for SWPF processing.

Prior to the telecon, the DOE provided the NRC with the following two documents, which are available in ADAMS:

- *DOE Slides of SRS Salt Waste Disposal Highlights and Timeline of NDAA 3116 Interactions* [ADAMS Accession No. ML17059D499]
- SRR-CWDA-2017-00027, Rev. 0, *DOE Chart of Path to Closure of NRC Type-IV Letter* [ADAMS Accession No. ML17059D497]

The second topic of the telecon was that, at a high-level, the DOE discussed the information in those two DOE documents, including emphasizing the effort, time, money, and resources to develop that information. The DOE indicated that significant progress had been made on some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern since the Letter was issued.

The DOE clearly indicated that they would like for: (1) the NRC Type-IV Letter of Concern to be closed; and (2) the NRC to reach reasonable assurance. The NRC asked the DOE what it expected the NRC to have reasonable assurance of. The DOE indicated that it was reasonable assurance of the DOE to meet the 10 CFR Part 61 POs. The NRC agreed and clearly indicated that reasonable assurance of the DOE to meet the 10 CFR Part 61 POs included reasonable assurance of the DOE to meet the §61.41 PO (Protection of the General Population from Releases of Radioactivity).

As part of the NRC review of the DOE FY 2014 Special Analysis Document [ADAMS Accession No. ML14316A586], the NRC staff is currently reviewing information provided in early February 2017 by the DOE. The results of that NRC staff review will be used as part of the NRC conclusions in a new SDF TER, which the NRC currently expects to issue sometime in spring 2018.

The NRC acknowledged that significant progress had been made by the DOE on some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern. Also, the NRC acknowledged the excellent DOE research performed since 2012 on some of the technical concerns that led to the Letter. In addition, the NRC appreciated that the DOE had previously provided proposed research plans for the NRC to review and comment on. The NRC indicated that it was looking forward to continuing to review and comment on future DOE research plans.

The DOE and the NRC discussed some previous communications since 2012:

- The NRC Letter of Acknowledgement to the DOE dated August 31, 2012, [ADAMS Accession No. ML12213A447] included statements that:
  - *The NRC staff evaluated the information that the DOE provided about the revised inventory of Tc-99 in SDS 2A, SDS 2B, SDS 3A, SDS 3B, SDS 5A, and SDS 5B and found that the bases for the revision to the inventory to be reasonable.*
  - *Therefore, based on the information provided by the DOE, the NRC offered no comments on the DOE plan regarding the placement of saltstone into SDS 2A, SDS 2B, SDS 3A, SDS 3B, SDS 5A, and SDS 5B.*

- The DOE clarified that:
  - The revised inventory was due to the lower curie content limit, which also meant lower dose due to Tc/I release.
  - The DOE SDF FY 2014 Special Analysis Document included that the DOE had now lifted that curie content limit.
- In response to a DOE question, the NRC replied that, as previously discussed in 2014 between the NRC and the DOE, there was no NRC TER based on the DOE SDF FY 2013 Special Analysis Document [ADAMS Accession No. ML14002A069] because the DOE had almost already completed the DOE SDF FY 2014 Special Analysis Document.

The DOE walked-through the graphic in the DOE document SRR-CWDA-2017-00027 relating to three technical concerns that were some of the technical concerns that led to the 2012 NRC Type-IV Letter of Concern: (1) SDF Performance Assessment Model Design; (2) Hydraulic Conductivity; and (3) Technetium Release.

During the DOE walk-through about SDF Performance Assessment Model Design, the NRC provided the following comments:

- Recently, the DOE indicated that it may use different assumptions about degradation that would make disposal structure performance and saltstone waste form hydraulic performance more important barriers to meet the POs.
- The NRC reminded the DOE that the NRC had previously identified concerns with degradation over the years, most recently: (1) the NRC Request for Additional Information (RAI) Comments on the DOE FY 2013 Special Analysis Document; and (2) the NRC RAI Questions on the DOE FY 2014 Special Analysis Document.
- The NRC is working on three future technical review reports (TRRs) on aspects of degradation: (1) high density polyethylene (HDPE), HDPE/geosynthetic clay liner, and the lower lateral drainage layers degradation; (2) saltstone waste form degradation; and (3) disposal structure degradation.

During the DOE walk-through about Hydraulic Conductivity, the NRC provided the following comment:

- In March 2017, the NRC expects to issue a TRR on initial saltstone waste form hydraulic properties and that TRR is expected to recommend closure of several high-priority monitoring factors in Revision 1 of the NRC SDF Monitoring Plan.
  - *For clarity, the NRC is providing more detail in this telecon summary:*
    - That NRC TRR was issued on March 23, 2017 [ADAMS Accession No. ML17018A137] and the NRC is in the process of sending a letter indicating that those monitoring factors are now closed

During the DOE walk-through about Technetium Release, the NRC provided the following comments:

- In response to a DOE question, the NRC replied that there would be publicly available reports based on NRC sponsored research with the Southwest Research Institute on simulated saltstone cores.
- In response to a DOE question, the NRC replied that the NRC would not be developing its own model or doing its own computer runs using the DOE model for the next NRC SDF TER, as the NRC did for the 2012 NRC SDF TER.
  - *For clarity, the NRC is providing more detail in this telecon summary:*
    - For the next NRC SDF TER, the NRC will not be basing dose conclusions on its own model runs, as it did in the 2012 NRC SDF TER; but, the NRC will run the DOE model to conduct a risk-informed review, as the NRC does with most performance assessment reviews.
  - The NRC clarified that it did its own computer runs for the 2012 SDF TER because the DOE model run with a more realistic representation of Tc sorption in the disposal structure floor resulted in a dose projection of up to about one thousand millirem (mrem) to the public, which the NRC did not believe was accurate due to the DOE use of an “average  $K_d$ ” model.
  - For the 2012 NRC SDF TER, the NRC did its own computer runs with a more realistic Tc sorption in the disposal structure floor; but, not using the DOE “average  $K_d$ ” model and those NRC calculations resulted in a dose projection that was closer to the public dose limit of 100 mrem.

Right before the end of the telecon, the DOE mentioned the DOE *SRS Liquid Waste Performance Assessment Maintenance Plan – Fiscal Year 2017 Implementation Plan* that had recently been provided to the NRC. The NRC had not yet had time to review that document, so it is expected to be discussed at a future technical telecon.

For the path forward, both the NRC and the DOE agreed that:

- Some current important technical concerns at SDF relate to: (1) degradation of saltstone; (2) Tc/I release rates and Tc solubility; and (3) the effect of residence time on release rates.
- It is important to know: (1) what the research and development (R&D) is that the DOE is planning to perform; (2) when the DOE intends to perform that R&D; and (3) when the results of that DOE R&D will be available.

In summary, based on the NRC staff/DOE staff discussion during this telecon, there is:

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