

July 18, 2016

NOTE TO: PROJ0734

ORGANIZATION: Department of Energy

SITE: Savannah River Site, F & H Tank Farm Closure

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON
May 17, 2016, BETWEEN THE U.S. NUCLEAR REGULATORY
COMMISSION STAFF AND DEPARTMENT OF ENERGY
REPRESENTATIVES CONCERNING NRC STAFF QUESTIONS
REGARDING TANKS 12H AND 16H GROUTING OPERATIONS

On May 17, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff and representatives of the U.S. Department of Energy (DOE) held a telephone conference call to discuss NRC staff questions related to Tanks 12H and 16H grouting operations and associated documentation. Representatives of the South Carolina Department of Health and Environmental Control (SC DHEC) also participated in the teleconference. The NRC is in the process of preparing a technical review report on the topic.

Enclosure 1 provides a listing of the telephone conference participants. Enclosure 2 contains a summary of the discussion. Enclosure 3 provides further details of the technical discussion. Enclosure 4 provides the list of questions sent to DOE in advance of the discussion.

A copy of this memo and the enclosures was provided to DOE and SC DHEC for comment.

/RA/

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and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: PROJ0734

Enclosures:

1. List of Participants
2. Summary of Discussion
3. Technical Discussion Details

A copy of this memo and the enclosures was provided to DOE and SC DHEC for comment.

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**LIST OF PARTICIPANTS
TELEPHONE CALL WITH DEPARTMENT OF ENERGY
SAVANNAH RIVER SITE, F & H AREA TANK FARM CLOSURE**

May 17, 2016

Participants

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Summary of Discussion

During the teleconference, Department of Energy (DOE) and the U.S. Regulatory Commission (NRC) discussed NRC questions e-mailed to DOE Savannah River Site following a February 2-3, 2016, onsite observation visit (OOV). The questions were primarily related to review of video of grouting of Tank 16H during the months of June through September 2015. Grout video was provided by DOE to the NRC in response to a follow-up action item to the July 28-29, 2015, OOV in late December 2015. The DVDs were also sent to NRC's contractor at the Southwest Research Institute in late January 2016 for review. Although NRC staff discussed some of its video observations at the February 2-3, 2016, OOV (see ML16111B174), the bulk of the discussion regarding the grouting of Tank 16H took place during this May 17, 2016, teleconference. The NRC staff explained that questions asked during this teleconference are akin to questions that NRC would raise in an onsite observation. However, due to the timing of completion of its review and NRC staff's desire to provide DOE with a list of questions well in advance of discussing the technical issues with DOE, NRC determined the questions were better discussed following the February 2-3, 2016, OOV after DOE had ample opportunity to review the questions. DOE proposed the date of the May 17, 2016, for the teleconference.

On February 26, 2016, the NRC staff provided DOE with a summary of the list of questions related to its review of Tank 16H grout video. The NRC began the teleconference by providing an overall summary of the questions that focused on three topics:

- Mounding of grout in Tank 16H underneath risers used as grout entry points, which led to difficulty in filling remaining void space at the top of Tank 16H, and necessitated a switch in the grout formulation used to fill the remaining void space. Ambient temperatures were attributed by DOE as the primary cause of the mounding. The NRC staff hypothesized that grout discharge rates could also be a contributing factor. Additionally, the NRC staff also reviewed specifications for a more flowable clean cap grout (a formulation previously used at the Saltstone Disposal Facility), which was used in Tank 16H to fill remaining void space at the top of the tank, and any impacts on H-Tank Farm performance associated with the change in grout formulation.
- Ability to stabilize waste in the Tank 16H ventilation duct. The NRC staff had technical concerns regarding the extent to which waste residing in the Tank 16H ventilation duct was grouted and the strategy used to fill the ventilation duct. The ventilation duct contains a significant quantity of relatively soluble waste from historical Tank 16H waste leakage.
- The causes of and extent of bleedwater segregation during tank grouting. The NRC staff had questions about sources of water in the tank that may exacerbate bleedwater segregation, and DOE's efforts to manage this water. Results of a grout drop test reported in RPT-5539-EG-0016 showed excessive bleedwater segregation when grout is dropped into a certain quantity of standing water. The NRC staff was also interested in better understanding mechanisms for bleedwater segregation observed during NRC staff's review of tank grouting operations.

- Grout shrinkage contributing to preferential pathways. The NRC reiterated its main technical concern regarding the potential for grout shrinkage, which could lead to the formation of preferential and by-passing pathways through the reducing tank grout, although this key technical issue was not a major focus of the teleconference call discussion. In addition to NRC staff's questions on the grout video, provided in the February 26, 2016 e-mail, the NRC staff requested a number of references to help complete its technical review. The list of references was updated and sent to DOE via e-mail on March 30, 2016, prior to the teleconference. DOE provided all *available* references to NRC prior to the May 17, 2016, teleconference (some references have not yet been completed and will be sent to NRC when they are available). The following is a summary discussion of the issues.

Bleedwater Segregation

- The NRC initiated a line of questioning related to observation of bleedwater segregation during grouting operations and factors that may enhance the phenomena (e.g., grouting into standing water).
- Grout drop test results presented in RPT-5539-EG-0016 showed higher hydraulic conductivity and loss of strength radially away from the drop point, particularly when grout was dropped in standing water.
- DOE takes efforts to ensure that grout is not discharged into standing water that could lead to excessive bleedwater segregation, loss of strength and higher hydraulic conductivity grout (based on the results of RPT-5539-EG-0016).
- DOE has also attempted to reduce the amount of water into tanks (e.g., decrease the use of pump priming agent), and has removed standing water from tanks such as Tank 12H.
- DOE is in discussion with SCDHEC regarding allowing ventilation systems to remain in place after tank isolation to facilitate removal of excess water.

Grout Mounding Below Risers

- Because the NRC is not convinced that grout mounding is attributable to high ambient temperatures alone, NRC inquired about DOE's efforts to establish a causative relationship between grout mounding and ambient temperature.
- The NRC thinks that grout discharge rates influence the extent of mounding.
- DOE has not attempted to correlate mounding with ambient air temperatures and agrees that discharge rates can contribute to mounding.

Bulk Fill and Clean Cap Grout Performance

- The NRC requested information about the clean cap grout formulation used in Tank 16H to fill remaining void space at the top of the tank when significant mounding of grout occurred below grout delivery points.
- NRC requested clarification regarding the term “TEMPER” listed on a clean cap grout batch ticket.
- DOE indicated that the use of caustic, one option listed in the clean cap grout specification, would lead to faster set times and decreased flowability.

Annulus Waste Stabilization

- The NRC indicated that it was unclear from review of the video that the waste in the annulus duct had been successfully stabilized with grout and questioned the basis for filling the duct from the outside of the duct (i.e. from the annulus side of the duct). The NRC asked DOE to provide additional supporting information on why it was confident that the ventilation duct had been filled.
- DOE indicated that there were a large number of openings in the duct to accept grout and it was able to observe grout entering and exiting the ventilation ducts utilizing the installed cameras.
- DOE indicated that it grouted from outside the duct, because of the deterioration of the duct itself.
- In the future, DOE intends to fill the remaining ducts from the inside rather than relying on grout to enter the duct from the annulus.

Discussion details and list of follow-up action items and list of follow-up questions from this May 17, 2016, teleconference can be found in Enclosure 3 at NRC's Agencywide Documents Access and Management System Accession No. ML16167A239.