Sequoyah Fuels Corporation
2015 Annual Performance Based License Report

Background

By letter dated 24 September 2009, Sequoyah Fuels Corporation (SFC) submitted a request to amend License SUB-1010 to enable SFC to make changes to the Reclamation Plan without approval of U.S. Nuclear Regulatory Commission (NRC). The request was subsequently revised by letters dated 25 March 2010 and 04 October 2010. The NRC staff reviewed the proposed license condition and determined that it was comparable to license conditions that are in other NRC licenses for similar sites, and could be implemented without being detrimental to the safety of the facility or public. The NRC approved the request on 12 December 2010 as License Condition 54 of Amendment 35 to License SUB-1010 [ML102740426].

Objective

The aforementioned license amendment effects a performance based license condition (PBL) delegating additional regulatory authority to SFC for various aspects of license activities. The authority may be exercised such that any change does not erode the basis for the NRC's original licensing decision. It is recognized that the review conducted by the licensee is not a review of safety or environmental acceptability: the licensee is obligated to ensure that any change considered should be safe and environmentally acceptable. Rather the licensee provides a determination of whether the proposed change(s) require prior NRC review; i.e., the licensee is responsible for determining if the proposed change needs to be submitted to the NRC. There will be circumstances where the licensee finds that the proposed change is acceptable; however, it may still require a NRC review.

Responsibility

SFC's determinations concerning the PBL are made by the Plant Review Committee (PRC). The PRC completes the determinations in accordance with a written operating procedure.

Scope

The PBL includes, in summary, that the licensee shall furnish, in an annual report to the NRC, a description of changes made pursuant to the PBL. The report shall include a summary of the safety and environmental evaluation of each change. This letter serves as the annual report for 2015.

Additionally, the licensee shall submit to the NRC, changed pages, which shall include both a change indicator for the area changed and a page change identification to reflect changes made pursuant to the PBL. The required submittal is included herein as Reclamation Plan Sequoyah Facility,

- Attachment E, Disposal Cell Construction Plan for the Sequoyah Fuels Corporation Facility, 27 October 2015 (Plan).
- Attachment A, Technical Specifications for the Sequoyah Fuels Corporation Disposal Cell, 27 October 2015 (Technical Specifications).

Requirement

The PBL requires, in summary, that the determinations concerning the PBL be made with respect to frequency or consequences of accidents evaluated or accidents different than evaluated, or an increase in likelihood of occurrence or a different occurrence of a malfunction of a facility structure, equipment, or monitoring system (SEMS) important to safety previously evaluated.

Results

The PBL was applied two times in 2015. A description of each change is as follows:

Control Number	Description of Change
CL014	Disposal Cell Construction Plan and Technical Specifications –

The Reclamation Plan Sequoyah Facility provides for a disposal cell on site. The design of the disposal cell includes an interior cell for disposal of the dewatered raffinate material (material). The purpose of this change is to revise the Reclamation Plan (RP), Attachment E *Disposal Cell Construction Plan* (Plan) and the RP, Attachment A *Technical Specifications for the Sequoyah Fuels Disposal Cell* (Specifications) to reflect relocating the material cell from the southwest side to the central interior of the disposal cell.

The material cell is not mentioned in the main text of the RP. The Plan and the Specifications only generally describe the location of the material cell. The Plan and the Specifications refer to the Drawings for the specific location of the material cell. The revisions of the Plan and Specifications are attached. The drawings are available with the controlled copy of the Specifications.

The Reclamation Plan (Plan) provided an evaluation of the radon flux from the surface of the disposal cell for that case of the raffinate material emplaced in the cell. The method used in the Plan to evaluate the radon flux was the RADON computer code. The Final Safety Evaluation Report (FSER) for approval of the Plan implicitly recognized the RADON code as an acceptable method of evaluation for calculation of radon flux. License Condition 54 b. vii. requires the licensee obtain a license amendment if the change would "result in a departure from the method of evaluation described in the license application … used in establishing the [FSER]". This change does not depart from use of the RADON code as the method of evaluation for calculation of radon flux.

The RADON code requires input of physical and radiological characteristics of the disposed materials to calculate an estimated long-term radon flux. Although the code allows distinction of disposed materials by physical characteristics, including layers (i.e., depth), the RADON code does not and cannot presuppose or account for any areal parameter (i.e., planar location). In other words, the horizontal location of the modeled condition is necessarily irrelevant to the radon flux calculation. The evaluation in the Plan did not describe any areal or planar dimension as an input or consideration for calculation of the radon flux. The FSER did not identify any areal or planar dimension as a consideration for review of radon attenuation.

To reduce the radon flux from the disposal cell above the planned location of the raffinate material cell, all of the raffinate material will be placed below 15 feet of waste material. Further, waste material in the top 15 feet in this location will be comprised of soils and demolition debris that is expected to have low levels of thorium and radium. The 15 feet of waste material overlying the raffinate material will be characterized for Th-230 and Ra-226 concentrations by sample collection as it is placed in the disposal cell. The raffinate material was characterized for Th-230 and Ra-226 concentrations by sample collection as it was dewatered and bagged in 2005. These two data sets will be utilized in modeling the radon emanation for the completed disposal cell.

Approval of the RP appropriately recognized the need to reassess radon emanation prior to installation of the cover system. Specifically, the License was amended to include Condition 51.A requiring "NRC approval prior to installation of the Radon Barrier [sic]". The Condition requires the "use [of] data from the upper 15 feet of contaminated material placed in the cell to demonstrate that the long-term radon flux will meet the requirements of 10 CFR Part 40, Appendix A Criterion 6(1)." This change does not involve or influence any compliance with this Condition.

The relocation of the raffinate material cell from the Phase II-A portion of the SFC disposal cell will not result in a change in the potential for differential settlement with the cell that could damage the cell cover system. Soil and soil-like materials above, and in the case of the proposed location, below the material cell, have been or will be compacted in accordance with specifications found in Section 6.3 of the Technical Specifications2 for the Sequoyah Fuels Corporation Disposal Cell. Since this specification has been applied to all compactable materials within the three phases of the disposal cell, differential settlement is not expected to occur.

The reclamation progress and redesign of the disposal cell have made the original design location for the material cell unavailable. This change does not change or alter any fundamental or original performance intent or capability. Previously, conceptually similar changes have been approved; e.g., footprint of the disposal cell on west side of Phase III, placement of the disposal cell perimeter berms.

CL015 Technical Specifications –

The Table of Contents was modified to include the current version of the design drawings (issued for construction). This new list replaces the list of fourteen drawings approved for construction in 2005 and referenced in the original version of technical specifications.

The specified gradation ranges in Section 7.2.3 are broadened. The specified gradation for the liner cover material is adjusted based on the availability of local materials for construction and based on the strength and stability of the cover material to provide a working surface for placement over the synthetic liner. The liner cover material is an 18-inch thick layer of sand that will be placed over the HDPE cover liner. The purposes of the layer are to protect the synthetic liner from damage during placement of more coarse-grained cover materials and to provide drainage for water that may infiltrate through the soil cover layers. The revised specification allows for a broader range of particle sizes and broader range of fines content (minus no. 200 sieve), which results in a gradation that is more in line with the sand materials used previously in construction. Secondly, the fines content of less than 10% in the original specification presented a concern for placement of the material on the 5:1 side slopes. The cohesionless material may be difficult to maintain in-place, on the HDPE-covered slopes, particularly during rain events. The broader gradation and increased fines content is provided to facilitate liner cover material placement on the slopes, while meeting the intended performance criteria of the liner cover layer.

The last sentence of Section 7.3.2 is modified to remove the text stating that the clay cover liner will be covered with a "bedding layer". Also, the requirement that the synthetic liner be placed within 24 hours is removed. As long as the clay layer is placed to the specified thickness, tested for density and moisture, visually inspected for changes (such as desiccation cracking), and each of these items are properly documented, the duration between final clay placement and synthetic liner placement may extend beyond 24 hours. Changes to the conditions of the clay layer that result in the clay being outside the specifications must be corrected or repaired prior to installation of the cover synthetic liner.

Section 7.3.4 is modified to remove text stating that the liner cover material is being placed over the synthetic liner to provide protection for placement of disposed material. Also, the second sentence is edited to state that the liner cover material will be spread over the synthetic liner cover, rather than over areas without the synthetic liner.

Sections 7.4.3 and 7.4.4 are edited to reduce the required frequency of particle-size testing for the liner cover material and the subsoil zone material. Due to the increased size of the repository, the original specification would require more than 90 gradations for the two materials combined. The reduced frequency will still provide adequate characterization of the layers for use in the RADON model calculations and provide control for the materials during placement.

These changes are also identified by the respective control number within the included copy of the subject plan.
A summary of the safety and environmental evaluation of these changes follows:

i. The accidents evaluated in the license application do not consider the design or construction of the disposal cell thus there is not an increase in the frequency of occurrence of an accident previously evaluated.

ii. The evaluations in the license application do not consider any functioning facility structure or equipment thus there is not an increase in the likelihood of occurrence of a malfunction of a SEMS important to safety.

The evaluations in the license application include the cover system. No change to the construction or performance of the cover system is implied or required here. No change to the placement of the material cell with respect to the overlying soils (i.e., soils between the material cell and the cover system) and cover system is implied or required here.

Specifications for the disposal cell clay liner, synthetic liner cover material, placement of the synthetic liner cover material, and associated testing remain within scope of the aforementioned evaluations in the license application. The changes to the Technical Specifications were developed to maintain the original design effectiveness.

iii. The accidents evaluated in the license application do not consider the design or construction of the disposal cell thus there is not an increase in the consequences of an accident previously evaluated.

iv. The evaluations in the license application do not consider any functioning facility structure or equipment thus there is not an increase in the consequences of a malfunction of a SEMS previously evaluated.

The evaluations in the license application include the cover system. No change to the construction or performance of the cover system is implied or required here. No change to the placement of the material cell with respect to the overlying soils (i.e., soils between the material cell and the cover system) and cover system is implied or required here.

Specifications for the disposal cell clay liner, synthetic liner cover material, placement of the synthetic liner cover material, and associated testing remain within scope of the aforementioned evaluations in the license application. The changes to the Technical Specifications were developed to maintain the original design effectiveness.

v. The changes to the plans do not reduce the performance or function of the disposal cell, thus there is not a possibility for an accident of a different type than any previously evaluated in the license application.

vi. The evaluations in the license application do not consider any functioning facility structure or equipment thus there is not a possibility of a malfunction of a SEMS with a different result than previously evaluated.

The evaluations in the license application include the cover system. No change to the construction or performance of the cover system is implied or required here. No change to the placement of the material cell with respect to the overlying soils (i.e., soils between the material cell and the cover system) and cover system is implied or required here.

Specifications for the disposal cell clay liner, synthetic liner cover material, placement of the synthetic liner cover material, and associated testing remain within scope of the aforementioned evaluations in the license application. The changes to the Technical Specifications were developed to maintain the original design effectiveness.

vii. The changes do not result in a departure from the methods of evaluation described in the license application (as updated) used in establishing the FSER or the EIS or other analyses and evaluations.

Conclusion

Application of the PBL in calendar year 2015 was limited to the Disposal Cell Construction Plan and the Technical Specifications. The changes were consistent with the NRC conclusions, or the basis of, or analysis leading to, the conclusions of actions, designs, or design configurations analyzed and selected in the site or facility Safety Evaluation Report (April 20, 2009 [ML090260323]) and Environmental Impact Statement (NUREG-1888, May 2008 [ML081300103]). This includes all supplements and amendments, and safety or technical evaluation reports, environmental assessments, and environmental impact statements issued with amendments to License SUB-1010.