



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 29, 2022

Greyson Buckingham
President and Chief Executive Officer
Disa Technologies, Inc.
1653 English Avenue
Casper, WY 82601

SUBJECT: UNITED STATES NUCLEAR REGULATORY COMMISSION STAFF
REGULATORY AND ACCEPTANCE REVIEW OF DISA TECHNOLOGIES'
LICENSE APPLICATION FOR THE USE OF HIGH-PRESSURE SLURRY
ABLATION TECHNOLOGY (DOCKET NO. 04038417)

Dear Greyson Buckingham:

In August 2022, Disa Technologies, Inc. (Disa) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) seeking a multi-site license to use a high-pressure slurry ablation (HPSA) system to remediate contaminated sites. The license application is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession No. [ML22213A144](#).

As noted in the NRC staff's email acknowledging receipt of the application on August 23, 2022, the NRC has not previously issued a license to use HPSA technology (ADAMS Accession No. [ML22236A012](#)). As such, the NRC staff first performed a regulatory review to identify the applicable regulations for licensing this technology. The regulatory review included consideration of Disa's proposed activities, the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40, "Domestic Licensing of Source Material," and previous instances in which the NRC staff considered the applicable regulations for HPSA technology.

According to Disa's application, the HPSA technology requires re-sizing of material (crushing), mixing with water to create a slurry, and pumping the slurry through high-pressure nozzles to create a high energy impact zone. After the impact zone, the slurry is separated into two streams. Disa refers to these two streams as an 'isolated mineral fraction,' which contains vanadium, source material, and other constituents of concern, and a 'clean coarse fraction,' which Disa states contains inert product of the remediated material. The application states that, depending on the client, the isolated mineral fraction would either be sent to a uranium mill for further processing or to a low-level waste disposal site and that the 'clean coarse fraction' would remain on-site.

Consistent with previous instances where the NRC has considered the applicable statutory and regulatory requirements for such technology,¹ the NRC staff has determined that the HPSA

¹ The NRC staff has considered such technology and the applicable regulations in 2016, 2018, and 2020 (ADAMS Accession Nos. [ML16272A302](#), [ML17311A280](#), and [ML20071G215](#)). Although the term "kinetic separation" was used in some of those evaluations, this term is synonymous with HPSA.

technology is uranium milling, as it produces Atomic Energy Act of 1954, as amended (AEA), 11e.(2) byproduct material, and is thus subject to 10 CFR Part 40, including Appendix A. NRC regulations in 10 CFR 40.4 define uranium milling as “any activity that results in the production of byproduct material as defined in [10 CFR Part 40].” Section 40.4 defines byproduct material as “the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content,” originating from the definition of byproduct material in Section 11e(2) of the AEA.

Based on Disa’s application, the proposed HPSA technology is an activity that produces byproduct material as it: (i) involves the concentration of uranium and/or thorium for the primary purpose of recovering the source material, (ii) from ore, and (iii) produces tailings or waste. The material is crushed, slurried, and pumped through the high-pressure nozzles. According to the application, it has an initial maximum concentration of 1,500 mg/kg of source material. After using the HPSA technology, the isolated mineral fraction will have a concentration of 7,000 mg/kg of source material. Thus, the uranium and/or thorium will be concentrated. Additionally, Disa’s application states that it will be treating waste rock, a term that falls within the definition of ore as defined in Attachment 2 of RIS-2000-23, “Recent Changes to Uranium Recovery Policy” (ADAMS Accession No. [ML003773008](#)). Finally, the HPSA technology produces tailings or waste, which is the clean coarse fraction resulting from the concentration of uranium and/or thorium from waste rock. For these reasons, as stated above, the NRC staff has determined that Disa’s application to utilize the HPSA technology is a form of uranium milling and is thus subject to 10 CFR Part 40, including Appendix A.

The NRC staff also completed an acceptance review of Disa’s license application. The purpose of the acceptance review is to determine whether there is sufficient information in the application to allow for a detailed technical review.

Disa’s license application requests authorization to handle and package unlimited quantities of source material in the form of a slurry paste. Disa further seeks a license that would allow the HPSA technology to be used at multiple sites simultaneously. As discussed above, the NRC staff’s regulatory review determined that the HPSA technology is a form of uranium milling. However, the license application does not address the requirements for uranium milling activities in 10 CFR Part 40, including Appendix A. In addition, the application does not propose alternate standards or request exemptions from these requirements. As such, the NRC staff has determined that Disa’s license application is not acceptable for review at this time as it does not provide sufficient information for the NRC staff to perform a detailed technical review.

As stated in Appendix A, the NRC can approve alternatives to the Appendix A criteria, provided that the proposed alternatives “achieve a level of stabilization and containment of the sites concerned, and a level of protection for public health, safety, and the environment from radiological and nonradiological hazards associated with the sites, which is equivalent to, to the extent practicable, or more stringent than the level which would be achieved by the requirements of this Appendix and the standards promulgated by the Environmental Protection Agency in 40 CFR Part 192, Subparts D and E.”

Should Disa wish to resubmit its application, the NRC staff has developed draft guidance for submission of an application seeking authorization for a conventional milling process. The guidance is available in NUREG-2126, “Standard Review Plan for Conventional Uranium Mill and Heap Leach Facilities” (ADAMS Accession No. [ML14325A634](#)). While this document remains in draft form, it is the most recent guidance staff has available for this type of

application. For an environmental report, Disa should consider the staff's guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs" (ADAMS Accession No. [ML032450279](#)). The NRC staff is available to support pre-application activities, including a pre-submission audit.

A copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System component of the NRC's ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding this letter, please contact Doug Mandeville of my staff at (301) 415-0724, or by email at douglas.mandeville@nrc.gov.

Sincerely,



Signed by Marshall, Jane
on 11/29/22

Jane E. Marshall, Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No.: 04038417

Letter to G. Buckingham Disa Technologies re completion of regulatory review and acceptance review of license application request DATE November 29, 2022

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