EXEC-2022-001844

Department of Energy
Washington, DC 20585

March 18, 2022

MEMORANDUM FOR GERALDINE L. RICHMOND
UNDER SECRETARY FOR SCIENCE AND INNOVATION

FROM: MATTHEW B. MOURY
DIRECTOR
OFFICE OF ENVIRONMENT, HEALTH, SAFETY AND SECURITY

SUBJECT: Approval of a Permanent Variance from Title 10 CFR Part 851, *Worker Safety and Health Program*, During Construction of the Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment Project at the Sanford Underground Research Facility

ISSUE: Whether to approve a permanent variance application submitted by Fermi Research Alliance, LLC (FRA), the management and operating contractor at the U.S. Department of Energy (DOE) Fermi National Accelerator Laboratory (Fermilab), from 10 CFR Part 851 for the construction of the Long Baseline Neutrino Facility (LBNF)/Deep Underground Neutrino Experiment (DUNE) project at the Sanford Underground Research Facility (SURF) in Lead, South Dakota.

BACKGROUND: Title 10 CFR § 851.3 defines a contractor as "any entity, including affiliated entities, such as a parent corporation, under contract with DOE, or a subcontractor at any tier, that has responsibilities for performing work at a DOE site in furtherance of a DOE mission." A DOE site is defined in § 851.3 as "a DOE-owned or -leased area or location or other area or location controlled by DOE where activities and operations are performed at one or more facilities or places by a contractor in furtherance of a DOE mission." In performing its DOE mission to operate the Fermilab, FRA is required to comply with the provisions in 10 CFR Part 851 that establish the framework for a worker protection program that will reduce or prevent occupational injuries, illnesses, and accidental losses by requiring DOE contractors to provide their employees with safe and healthful workplaces. FRA must ensure that its subcontractors comply with these requirements.

FRA is seeking a permanent variance from § 851.23(a)(7) during the construction of the LBNF/DUNE project. This provision would require FRA and its subcontractors to comply with the requirements in 29 CFR Part 1926, "Safety and Health Regulations for Construction." Specifically, FRA is requesting a variance from the requirements of 29 CFR § 1926.800(k)(3).

The LBNF/DUNE project is a deep level (4,850 ft) underground research lab that is ventilated mechanically through exhaust fans. The construction project will excavate three caverns one mile underground and is estimated to be completed in approximately two years. Due to the restricted airflow in the existing underground drifts and the large-scale caverns to be constructed, FRA will not be able to consistently comply with the 30 feet per minute (fpm) rate required in 29 CFR § 1926.800(k)(3), across the underground working face area where drilling and blasting will be taking place. As a result of the existing tunnel and drift size differentials (face opening sizes) within the underground facility, maintaining consistent 30-fpm airflows in the large caverns would create increased airflow velocities throughout the existing underground space. The increase in airflow velocities would create additional hazards including airborne dusts and silica contaminants in the DOE-leased space managed by FRA and the space operated by the South Dakota Science and Technology Authority (SDSTA), a quasi-state of South Dakota organization.[1] The hazards related to the increased airflow velocities were identified through analysis of a simulation model of the underground space.

Title 10 CFR § 851.30 authorizes Under Secretaries[2] to approve variances after considering the recommendation of the Associate Under Secretary for Environment, Health, Safety and Security (now, Director of the Office of Environment, Health, Safety and Security (EHSS Director)).[3] Title 10 CFR § 851.31(a) requires the contractor desiring the variance to submit a written application to the appropriate Cognizant Secretarial Officer (CSO),[4] who may forward the application to the EHSS Director. FRA submitted the permanent variance application to DOE's Office of Science (SC), and on February 28, 2022, the SC Deputy Director for Field Operations forwarded the permanent variance application to the EHSS Director with the recommendation that approval be subject to the condition that "If there are changes in assumption[s] that would impact ventilation/fan usage, notice will be provided to DOE in advance of conducting work that includes modeling and validation that the terms of the DOE approved variance are being met."

Upon receipt of the application from a CSO, 10 CFR § 851.31(a)(3) requires the EHSS Director to review the application and make a written recommendation to approve the application, approve the application with conditions, or deny the variance application. Based on the information provided in the variance application and additional information obtained through the review process, the EHSS Director agrees with the SC Deputy

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[1] The SURF site is owned and operated by the SDSTA; the LBNF/DUNE facility will be constructed in a DOE-leased portion of SURF.

[2] Under Secretary is defined in § 851.3 as "with respect to a particular situation, the DOE official who serves as the Under Secretary for Science and Energy [now the Under Secretary for Science and Innovation], or Under Secretary for Management and Performance, or the Under Secretary for Nuclear Security/Administrator for National Nuclear Security Administration who has primary line management responsibility for a contractor."

[3] The EHSS Director is referred to in 10 CFR Part 851 by the previous title of "Associate Under Secretary for Environment, Health, Safety and Security."

[4] CSO is defined in § 851.3 as "with respect to a particular situation, the Assistant Secretary, Deputy Administrator, Program Office Director, or equivalent DOE official who has primary line management responsibility for a contractor, or any other official to whom the CSO delegates in writing a particular function under this part."

Director for Field Operations that this variance application submitted by FRA should be approved, subject to the conditions outlined below. Copies of the February 28, 2022, Memorandum from the SC Deputy Director for Field Operations regarding the variance application and the FRA variance application are attached.

JUSTIFICATION: FRA is requesting a permanent variance from 10 CFR § 851.23(a)(7) for the period of construction only, due to the inability of FRA and its subcontractors to consistently comply with the airflow requirements in 29 CFR § 1926.800(k)(3). Instead, FRA and its subcontractors will adopt a localized ventilation approach versus the general dilution ventilation requirement of 30-fpm prescribed in 29 CFR § 1926.800(k)(3). The localized ventilation approach is expected to:

- Minimize wind velocities in the auxiliary tunnels that supply ventilation to the project to reduce the dust/silica exposures in the entire underground; and

- Eliminate the sitewide hazard that would be created while also ensuring LBNF-related personnel exposures are maintained below the applicable American Conference of Governmental Industrial Hygienists (ACGIH®) Threshold Limit Values.

This information, along with other information included in the variance request, supports the conclusion that implementation of FRA's permanent variance would provide workers a place of employment that is as safe and healthful as would result from compliance with 10 CFR § 851.23(a)(7), as required by Subsection (d)(2)(ii) of 10 CFR 851.31, *Variance Process*.

Based upon a review by the EHSS Director and EHSS staff, the EHSS Director recommends approval of FRA's permanent variance application, subject to the following:

(1) The recommended approval is contingent upon implementation of the specific conditions, practices, means, methods, operations, or processes being used as described in the 8 October 2021, Revised 18 February 2022, variance request;

(2) If there are changes in assumptions that would impact ventilation/fan usage, notice must be provided by FRA to the Fermi Site Office Manager that includes modeling and validation that the terms of the approved variance are continuing to be met, in advance of conducting work; and

(3) FRA must ensure that each subcontractor:

   a. Is in compliance with the requirement of 10 CFR § 851.10(a)(2)(ii) to conduct work in accordance with a DOE-approved worker safety and health program before work is performed at a DOE site in furtherance of a DOE mission;

b. Complies with the specific conditions, practices, means, methods, operations, or processes being used as described in FRA's permanent variance application; and

c. Notifies FRA and the Fermi Site Office Manager if there are changes in assumptions that would impact ventilation/fan usage, in advance of conducting work, which includes modeling and validation that the terms of the approved variance are continuing to be met.

RECOMMENDATION: That you approve the permanent variance for the construction of the LBNF/DUNE project, subject to compliance with the conditions listed above. This recommendation is contingent upon the requirement that the variance will expire upon completion of construction of the LBNF/DUNE project, as indicated in the request by FRA.

APPROVE: GLR DISAPPROVE:_____ NEEDS DISCUSSION:_____ DATE: 04/07/22

Attachments