



## Department of Energy

Washington, DC 20585

February 8, 2024

Dr. Lia Merminga  
Laboratory Director  
Fermi Research Alliance, LLC  
P.O. Box 500  
Batavia, Illinois 60510-5011

NCO-2024-01

Dear Dr. Merminga:

The Office of Enterprise Assessments' Office of Enforcement has completed its investigation into the facts and circumstances associated with an unplanned radiation exposure to a worker in the Proton Source Test Stand (PSTS) area of the Linac Building at the Fermi National Accelerator Laboratory. The exposure occurred following modifications made in May 2022, to the operating parameters of a radiation generating device. Fermi Research Alliance, LLC (FRA) documented this event into the Department of Energy's (DOE) Noncompliance Tracking System under report NTS-SC-FSO-FRA-FERMIBOP-2022-0010490, *Unplanned Radiation Dose*, dated October 18, 2022. On August 22, 2023, DOE transmitted their Investigation Summary to FRA, and on September 20, 2023, an enforcement conference was convened with FRA to discuss the summary's findings.

DOE views this event as significant because multiple barriers did not work as intended to ensure that doses to the worker were maintained As Low As is Reasonably Achievable (ALARA). This resulted in an unplanned dose to the worker and demonstrates that the radiation protection controls established by FRA were not adequate to safely operate the PSTS. The Investigation Summary provided details of inadequacies to monitor, post, and control the PSTS area. In addition, DOE noted programmatic weaknesses with FRA's work planning and control processes, which resulted in less than adequate documentation, review, and authorization for PSTS operation. DOE is also concerned that FRA did not escalate issues appropriately (e.g., off scale supplemental dosimeter reading and abnormal radiation survey readings) or provide adequate oversight of the PSTS work. The Office of Enforcement concluded that the causal analysis and corrective action items developed by FRA appear adequate to address the direct, root, and contributing causes of this event.

In accordance with 10 C.F.R. § 820.23, *Consent Order*, the Office of Enforcement has elected to resolve any potential noncompliances with requirements enforceable under 10 C.F.R. Part 820, *Procedural Rules for DOE Nuclear Activities*, through execution of a Consent Order. In deciding to enter into this Consent Order, DOE placed considerable weight on FRA's comprehensive response to the event. This included FRA's senior leadership and board of

directors taking ownership of the response to this event and their comprehensive commitments to improve overall culture and performance to prevent recurrence.

DOE reserves the right to re-open this investigation if DOE later becomes aware that FRA provided any false or materially inaccurate information. Further, if there is a recurrence of nuclear safety deficiencies similar to those identified in this Consent Order, or a failure to complete all action items prescribed and on schedule in the Consent Order (or other related actions that FRA subsequently determines to be necessary) to prevent recurrence of the identified issues, then the Office of Enforcement may pursue additional enforcement activity. The Office of Enforcement, Office of Science, and Fermi Site Office will continue to closely monitor FRA's implementation of DOE nuclear safety requirements until the issues associated with this Consent Order are fully resolved.

Enclosed please find the Consent Order for your signature. Within 1 week from the date of receipt, sign and return to the Consent Order to the Office of Enforcement. Please follow all instructions specified in the enclosure and keep a copy for your records. By signing this Consent Order, you agree to comply with all of the terms specified in section IV of the Consent Order and in the manner prescribed therein.

If you have any questions concerning this Consent Order, please contact me or Mr. Jacob M. Miller, Director, Office of Nuclear Safety Enforcement, at 301-903-7707.

Sincerely,



Anthony C. Pierpoint  
Director  
Office of Enforcement  
Office of Enterprise Assessments  
Department of Energy

Enclosure: Consent Order (NCO-2024-01)

cc: Roger E. Snyder, SC-FSO  
Mathew Quinn, Fermi Research Alliance, LLC



laboratory's event review revealed programmatic weaknesses in work planning and control that resulted in less than adequate documentation, review, and authorization of PSTS operations. The event review also identified weaknesses with escalating issues appropriately, following supplemental personal dosimetry monitoring and reporting expectations, and operations oversight.

FRA self-identified the following potential non-compliances, which were reported in the DOE Noncompliance Tracking System (NTS) under report NTS-SC-FSO-FRA-FERMIBOP-2022-0010490, *Unplanned Radiation Dose*, on October 18, 2022:

- 10 C.F.R. Part 835, Subpart E, *Monitoring of Individuals and Areas*:
  - § 835.401, *General Requirements*;
- 10 C.F.R. Part 835, Subpart H, *Records*:
  - § 835.701, *General provisions*;
  - § 835.703, *Other monitoring records*;
  - § 835.704, *Administrative records*;
- 10 C.F.R. Part 835, Subpart K, *Design and Control*:
  - § 835.1001, *Design and Control*;
  - § 835.1003 *Workplace controls*.

On February 6, 2023, the Office of Enforcement notified FRA of its decision to investigate the facts and circumstances associated with the unplanned dose and potential deficiencies in the implementation of 10 C.F.R. part 835, *Occupational Radiation Protection*. The Office of Enforcement conducted an onsite investigation April 24 through 27, 2023. On August 22, 2023, DOE transmitted the Investigation Summary report to FRA and an enforcement conference was held on September 20, 2023.

As part of the investigation, the Office of Enforcement reviewed FRA's causal analysis and found it comprehensive. FRA's causal analysis actions are recorded in three documents: *Unplanned Radiation Dose Event Review Report Summary*, dated October 18, 2022; an updated causal analysis map dated April 21, 2023; and the corrective action plan dated July 24, 2023. FRA's corrective action plan includes 16 near-term action items and 7 long-term action items. The Office of Enforcement found that the causal analysis and corrective action items appear adequate to address the direct, root, and contributing causes and the potential noncompliances.

### III

Pursuant to 10 C.F.R. § 820.23, at any time during enforcement proceedings, DOE may resolve any or all outstanding issues with a Consent Order if the settlement is consistent with the objectives of the Atomic Energy Act of 1954, as amended, and DOE nuclear safety requirements enforceable under 10 C.F.R. Part 820, *Procedural Rules for DOE Nuclear Activities*.

To resolve potential noncompliances with DOE nuclear safety requirements, and in consideration of FRA's event review, causal analyses, and associated corrective actions taken since the submission of the NTS report referenced above, DOE has elected to enter into settlement. DOE and FRA have reached agreement to resolve this matter through execution of this Consent Order.

## IV

Accordingly, the terms of this Consent Order are as follows:

In consideration of the mutual agreements set forth in this section, the sufficiency and adequacy of which are acknowledged by DOE and FRA (hereinafter the "Parties"), the following terms represent agreement by the authorized representatives of the Parties to resolve by settlement the potential noncompliances at Fermi National Accelerator Laboratory, in lieu of initiating an enforcement action that DOE may issue pursuant to 10 C.F.R. § 820.24. Additionally, in consideration of the action to be taken by FSO affecting FRA's performance evaluation and fee reduction for the circumstances associated with this event, DOE has decided to exercise enforcement discretion in not assessing the monetary remedy that would otherwise be imposed under this Consent Order.


1. FRA shall fully complete and implement all the following actions:
  - a. Within 12 months of the effective date of the Consent Order, FRA shall complete and implement all corrective actions remaining as of October 20, 2023, in: NTS-SC-FSO-FRA-FERMIBOP-2022-0010490; Exhibit A to FRA's "*Request for Settlement re: Unplanned Radiation Exposure Investigation, NTS-SC-FSO-FRA- FERMIBOP-2022-0010490 October 18, 2022,*" dated July 24, 2023; and iTrack Review #58146.
  - b. Provide quarterly written updates to the Office of Enforcement and FSO on the status of corrective actions referred to in 1.a, above.
  - c. Within 18 months of the effective date of the Consent Order, FRA ensure completion of an independent effectiveness review (conducted by personnel outside of FRA) of the corrective actions referred to in 1.a, above, and provide the results of this effectiveness review to the Office of Enforcement and FSO.
  - d. Notify the Office of Enforcement and FSO upon completion of all actions specified above within 30 calendar days after completion.
2. FRA agrees to return a signed copy of this Consent Order, within 1 week from the date of receipt, via email, to the Director, Office of Enforcement, at [enforcementdocketclerk@hq.doe.gov](mailto:enforcementdocketclerk@hq.doe.gov).
3. The effective date of this Consent Order shall be the date upon which FRA signs this Consent Order.
4. Subject to the provisions of paragraph 6, below, this Consent Order shall constitute a full and final settlement of the potential noncompliances identified in the referenced NTS report, subject to FRA's completion of all actions set forth in item 1 above to the satisfaction of DOE and the Office of Enforcement.
5. No costs, as defined in the Federal Acquisition Regulation, 48 C.F.R. § 31.205-47, *Costs related to legal and other proceedings*, incurred by, for, or on behalf of FRA relating to

coordination and cooperation with DOE concerning the investigation of matters covered by this Consent Order, shall be considered allowable costs under the Contract. However, costs incurred by, for, or on behalf of FRA relating to the development and implementation of corrective actions, including costs associated with the effectiveness review required under item 1, above, may be considered allowable costs under the Contract.


6. This Consent Order does not preclude DOE from re-opening the investigation or issuing an enforcement action under 10 C.F.R. § 820.24 with respect to a potential noncompliance if: (a) after the effective date (as defined in item 3 above), DOE becomes aware of any false or materially inaccurate facts or information provided by FRA; (b) there is a recurrence of nuclear safety deficiencies similar to those identified above; or (c) FRA fails to complete all actions identified in item 1, above, in a timely and effective manner to prevent recurrence of the identified issues.
7. Any modification to this Consent Order must be executed in writing and be signed by both Parties to the Consent Order.
8. FRA waives any and all rights to appeal or otherwise seek judicial or administrative review of the terms of this Consent Order. DOE retains the right to judicially enforce the provisions of this Consent Order by all available legal means.
9. This Consent Order is issued pursuant to DOE's authority under Section 234A of the Atomic Energy Act of 1954, as amended (42 U.S.C. § 2282a), and the implementing provisions of 10 C.F.R. Part 820 governing the enforcement of DOE nuclear safety requirements.
10. Pursuant to 10 C.F.R. § 820.23(d), this Consent Order shall become a Final Order 30 calendar days after the signed copy, referenced in item 3, above, is filed by the Office of Enforcement's Office of the Docketing Clerk, unless the Secretary of Energy files a rejection of the Consent Order or a modified Consent Order.

On behalf of my respective organization, I hereby agree to and accept the terms of the foregoing Consent Order.

FOR U.S. Department of Energy

  
 Date 1/30/24  
 Anthony C. Pierpoint, PhD  
 Director  
 Office of Enforcement  
 Office of Enterprise Assessments

FOR Fermi Research Alliance, LLC

  
 Date 2/2/24  
 Nikolitsa (Lia) Merminga, PhD  
 Laboratory Director  
 Fermi Research Alliance, LLC