



Department of Energy
Washington, DC 20585

April 6, 2018

Office of Enforcement
Office of Enterprise Assessments
RECEIVED
APR 13 2018

Dr. Paul K. Kearns
Director
UChicago Argonne, LLC
Argonne National Laboratory
9700 S. Cass Avenue
Lemont, Illinois 60439

APR 13 2018

WCO-2018-02

Dear Dr. Kearns:

The Office of Enterprise Assessments' Office of Enforcement has completed its investigation into the facts and circumstances associated with the potential deficiencies in UChicago Argonne, LLC's (UChicago Argonne) implementation of the Department of Energy's (DOE) 10 C.F.R. Part 851 electrical safety program requirements and two events involving workers contacting hazardous electrical energy. DOE considers these events and the underlying electrical safety program concerns to be of high safety significance.

On May 10, 2017, a technician received thermal contact second-degree burns on two fingers while troubleshooting instrumentation installed on a plug-in hybrid electric vehicle's high voltage battery pack. UChicago Argonne reported this event into DOE's Noncompliance Tracking System under report NTS--ASO-ANLE-ANLEES-2017-0001, *Employee Experiences Contact with Hazardous Energy Source During Troubleshooting*, dated June 9, 2017.

On July 18, 2017, an employee received second-degree burns to his left hand from an arc flash while testing a 10 kilovolt, 15.5 kilojoule capacitor inside a high voltage cage. UChicago Argonne reported this event into DOE's Noncompliance Tracking System under report NTS--ASO-ANLE-ANLEAPS-2017-0001, *Employee Experiences Contact with Hazardous Energy Source*, dated August 14, 2017.

In accordance with 10 C.F.R. § 851.41, *Settlement*, the Office of Enforcement has elected to resolve any potential noncompliances with requirements enforceable under 10 C.F.R. Part 851, *Worker Safety and Health Program*, through execution of a Consent Order. In deciding to enter into this Consent Order, DOE placed considerable weight on UChicago Argonne's identification of weaknesses in the laboratory's electrical safety program and the common cause analysis that was initiated prior to these events.



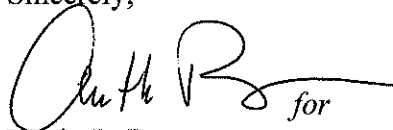
DOE also considered UChicago Argonne's response to both events, the independent review commissioned by the Board of Governors of Argonne National Laboratory, and comprehensiveness of planned corrective actions to address systemic issues.

DOE reserves the right to re-open this investigation if DOE later becomes aware that UChicago Argonne provided any false or materially inaccurate information. Further, if there is a recurrence of worker safety and health deficiencies similar to those identified in this Consent Order, or a failure to comply with the terms and conditions prescribed in the Consent Order (or other related actions that UChicago Argonne 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 Argonne Site Office will continue to closely monitor UChicago Argonne's implementation of worker safety and health requirements until the issues associated with this Consent Order are fully resolved.

Enclosed please find two signed copies of the Consent Order. Please sign both, keep one for your records, and return the other copy to the Office of Enforcement within 1 week from the date of receipt. Please follow all instructions specified in the enclosure. 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 at 301-903-7707, or your staff may contact Dr. Anthony Pierpoint, Director, Office of Worker Safety and Health Enforcement, at 301-903-0100.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin L. Dressman", followed by a horizontal line and the word "for" in a smaller font.

Kevin L. Dressman
Acting Director
Office of Enforcement
Office of Enterprise Assessments

Enclosure: Consent Order (WCO-2018-02)

cc: Joanna Livengood, DOE-ASO
Stuart Meredith, UChicago Argonne

In the matter of) Report No. NTS--ASO-ANLE-ANLEES-2017-0001
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CONSENT ORDER INCORPORATING AGREEMENT BETWEEN THE U.S. DEPARTMENT OF ENERGY AND UCHICAGO ARGONNE, LLC.

I

UChicago Argonne, LLC (UChicago Argonne) is responsible for management and operation of the Department of Energy’s (DOE) Argonne National Laboratory. UChicago Argonne is the prime contractor under Contract No. DE-AC02-06CH11357, entered into with the U.S. Department of Energy Office of Science (SC).

II

Over a two and a half month period, UChicago Argonne experienced two separate events involving work with electrical energy storage devices.

On May 10, 2017, a technician received thermal contact second-degree burns on two fingers while troubleshooting instrumentation installed on a plug-in hybrid electric vehicle’s high voltage battery pack. During instrumentation installation, the service plug grip was removed and locked, leads from a lab-built fuse box were attached to the battery terminals, and the system re-energized. After connecting leads to the data acquisition system, the system was unexpectedly reading negative voltage. The technician attempted to switch the orientation of a pair of stacking banana jack test lead plugs located between the battery pack and the fuse box but inadvertently connected the positive and negative plugs from the battery terminals. The resulting short circuit caused the wire to melt and the technician’s injury.

UChicago Argonne reported the noncompliances associated with the May 10, 2017, event into the DOE Noncompliance Tracking System (NTS) under report NTS--ASO-ANLE-ANLEES-2017-0001, *Employee Experiences contact with Hazardous Energy Source during Troubleshooting*, dated June 9, 2017.

On July 18, 2017, an employee received second-degree burns to his left hand from a capacitor arc flash. Two employees were sequentially testing a number of 10 kilovolt, 15.5 kilojoule capacitors inside a high voltage cage. After testing the first capacitor, a different power source was selected to reduce charging time. Because of the output polarity of the power source, the

capacitor can was charged with the post serving as ground. After finishing testing of the second capacitor, one employee, wearing appropriate personal protective equipment, applied a discharging stick to the capacitor for approximately 10 seconds. The discharging stick did not adequately discharge the capacitor and a zero voltage check was not performed. When the second employee, dressed in normal attire and safety glasses, attempted to attach the safety ground across the capacitor, the arc flash occurred.

UChicago Argonne reported the noncompliances associated with the July 18, 2017, event into NTS under report NTS--ASO-ANLE-ANLEAPS-2017-0001, *Employee Experiences Contact with Hazardous Energy Source*, dated August 14, 2017.

On October 16, 2017, the DOE Office of Enforcement notified UChicago Argonne of its decision to investigate the facts and circumstances associated with potential deficiencies in implementation of the laboratory's electrical safety program requirements.

In a December 6, 2017, letter to the Office of Enforcement, UChicago Argonne requested a Consent Order to settle this matter under investigation. This request outlined actions undertaken to improve their electrical safety program, including:

- In March 2017, prior to the two events, UChicago Argonne commissioned an electrical common cause analysis team to examine electrical incidents over the prior three and a half years. The team included electrical subject matter experts from two other Office of Science laboratories. The common cause analysis report was issued on May 31, 2017, and development of corrective actions was initiated.
- After the July 2017 event, the Laboratory Director suspended all electrical work at Argonne National Laboratory. A temporary emergency review and permitting process was instituted until re-start plans were developed and implemented over a several month period.
- In September 2017, the Board of Governors of Argonne National Laboratory assembled an independent review team and performed a safety review at the laboratory.

UChicago Argonne's common cause analysis, event investigations, and independent review identified a number of weaknesses in the laboratory's electrical safety program, work planning and control, communications, and employee concerns management. As a result, UChicago Argonne developed a comprehensive corrective action plan to address the event-specific and systemic issues identified.

DOE conducted an onsite investigation from December 11, 2017, through December 15, 2017.

III

Pursuant to 10 C.F.R. § 851.41, at any time during enforcement proceedings, DOE may resolve any or all outstanding issues with a Consent Order if the settlement is consistent with 10 C.F.R. Part 851, *Worker Safety and Health Program*.

To resolve potential noncompliances with worker safety and health requirements and in consideration of UChicago Argonne's initiation of a common cause analysis of their electrical safety program prior to the first event, investigations and cause analyses of the two events, and associated corrective actions, DOE has elected to enter into settlement. DOE and UChicago Argonne 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 UChicago Argonne (hereinafter the "Parties"), the following terms represent agreement by the authorized representatives of the Parties to resolve by settlement the potential noncompliances at Argonne National Laboratory, in lieu of an enforcement action that DOE may issue pursuant to 10 C.F.R. § 851.42-851.43.

1. UChicago Argonne shall complete all of the following actions by May 31, 2019:
 - a. Fully implement each of the measures described in the document entitled: *Argonne Electrical Safety Corrective Action Plan* (CAP), dated February 16, 2018, by the due dates established in the CAP. In addition to addressing specific factors related to these two events, these corrective actions include updating electrical safety program procedures and requirements documents, restructuring resources to support the electrical safety program, enhancing electrical safety training for workers and supervisors, evaluating potential gaps in the inspection process for lab-constructed electrical devices, improving communications and employee concern management, evaluating surplus property management procedures to identify opportunities for improvement, and benchmarking and establishing metrics to evaluate electrical safety program performance.
 - b. By May 31, 2018, provide to the Office of Enforcement and ASO a copy of the laboratory's project plan to improve the work planning and control process.
 - c. Obtain ASO approval for any changes to the CAP, and communicate all approved changes in writing to the Office of Enforcement.
 - d. Provide quarterly written updates on the status of corrective actions and efforts covered in the work planning and control project plan to the Office of Enforcement and ASO, beginning within 90 days from the signing of the Consent Order.

- e. Notify the Office of Enforcement and ASO upon completion of all actions specified in the CAP.
 - f. Provide to Office of Enforcement and ASO copies of the results of the effectiveness reviews identified in the CAP within 30 days of completing each review.
2. UChicago Argonne agrees to return a signed copy of this Consent Order, within one week from the date of receipt, to the below address:

Director, Office of Enforcement
Attention: Office of the Docketing Clerk, EA-10
U.S. Department of Energy
19901 Germantown Road
Germantown, Maryland 20874-1290
3. The Effective Date of this Consent Order shall be the date upon which UChicago Argonne signs this Consent Order.
4. This Consent Order shall constitute a full and final settlement of the potential noncompliances identified in the referenced NTS reports, subject to UChicago Argonne's completion of all actions set forth in item 1 above to the satisfaction of ASO and the Office of Enforcement.
5. In lieu of the issuance of an enforcement action pursuant to 10 C.F.R. §§ 851.42-851.43, DOE has entered into this Consent Order with UChicago Argonne. In consideration of the \$683,854.58 contract fee reduction that DOE has imposed for the circumstances leading to multiple electrical events, and consistent with 10 C.F.R. § 851.5(c), no monetary remedy is included in this Consent Order.
6. No costs, as defined in the Federal Acquisition Regulation, 48 C.F.R. § 31.205-47, incurred by, for, or on behalf of UChicago Argonne 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 UChicago Argonne relating to the development and implementation of corrective actions, including costs associated with the effectiveness reviews required under item 1 above, may be considered allowable costs under the Contract.
7. This Consent Order does not preclude DOE from re-opening the investigation or issuing an enforcement action under 10 C.F.R. § 851.42 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 UChicago Argonne;
 - (b) there is a recurrence of worker safety and health deficiencies similar to those identified above; or
 - (c) UChicago Argonne fails to complete all actions identified above in a timely and effective manner to prevent recurrence.
8. Any modification to this Consent Order requires the written consent of both Parties.

9. UChicago Argonne 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.
10. This Consent Order is issued pursuant to DOE's authority under Section 234C of the Atomic Energy Act of 1954, as amended (42 U.S.C. § 2282c), and the implementing provisions of Part 851 governing enforcement of worker safety and health requirements at DOE sites.
11. This Consent Order shall become a Final Order after the signed copy, referenced in item 2 above, is filed by the Office of Enforcement's Office of the Docketing Clerk.

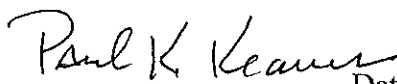
On behalf of my respective organization, I hereby agree to and accept the terms of the foregoing Consent Order.

FOR U.S. Department of Energy


for
Date 4/6/18

Kevin L. Dressman
Acting Director
Office of Enforcement
Office of Enterprise Assessments

FOR UChicago Argonne, LLC


Date 4/9/2018

Paul K. Kearns
Laboratory Director
UChicago Argonne, LLC