



Department of Energy
Washington, DC 20585

April 3, 2014

Dr. Peter B. Littlewood
President, UChicago Argonne, LLC
Director, Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

NCO-2014-01

Dear Dr. Littlewood:

The Office of Health, Safety and Security's Office of Enforcement and Oversight has completed its investigation into the facts and circumstances associated with the March 28, 2013, identification of an incorrect hazard categorization of Building 205 G-Wing. This issue was reported in Noncompliance Tracking System report NTS--ASO-ANLE-CSE-2013-0001, *Legacy Glove Box Disposal Process Reveals Levels of Contamination in Two Glove Boxes That Exceed HC-3 Limit*.

This incorrect hazard categorization of Building 205 G-Wing was attributable to the failure to comprehensively account for all facility radiological material, including holdup and facility contamination. The need to account for all radionuclides in laboratory facilities had been previously identified by UChicago Argonne LLC (UChicago) and the Department of Energy (DOE) Argonne Site Office (ASO) on several occasions through planning documents, assessments, and related corrective actions. However, UChicago's actions in response to the identified deficiencies in the data in its radiological inventory tracking system and the processes for tracking radiological material inventory proved ineffective in preventing exceedance of the Building 205 G-Wing HC-3 threshold inventory limit. Title 10 C.F.R. Part 830, Subpart B, *Safety Basis Requirements*, requires each contractor responsible for a DOE hazard category 1, 2, or 3 nuclear facility to analyze the facility, the work performed, and the associated hazards and to identify the conditions, safe boundaries, and hazard controls necessary to protect workers, the public, and the environment from adverse consequences. UChicago's failure to correctly categorize Building 205 G-Wing as a hazard category 3 nuclear facility compromised this required analysis and the subsequent protection of facility workers, the public, and the environment.

UChicago's investigation into this issue identified six causal factors and five other factors that contributed to the incorrect hazard categorization of Building 205 G-Wing. These factors included: (1) the incorrect assumption in the facility downgrade criteria that radiological holdup and contamination would be adequately accounted for; (2) lack of nuclear safety expertise; (3) less than adequate implementation of the radioactive material tracking process; and



(4) incomplete corrective action implementation. DOE has evaluated UChicago's investigation and causal analysis of this issue and finds them to be comprehensive and appropriately self-critical. The identified corrective actions are appropriately linked to the identified causal factors and other factors. As part of an associated extent-of-condition review, UChicago committed to a sitewide nuclear material inventory characterization of 17 nuclear facilities.

In accordance with 10 C.F.R. § 820.23, the Office of Enforcement and Oversight has exercised its enforcement discretion to resolve any potential noncompliances through a Consent Order. In choosing to enter into this Consent Order, DOE placed considerable weight on the fact that no other UChicago nuclear facilities have been identified as incorrectly categorized and the assumption that UChicago's extent-of-condition review will show that all reviewed nuclear facilities are correctly categorized. If the facts had been otherwise, it is highly unlikely that DOE would have agreed to a settlement.

DOE reserves the right to reinstate enforcement proceedings against UChicago if DOE later becomes aware that UChicago provided any false or materially inaccurate facts or information. Further, if there is a recurrence of nuclear safety deficiencies similar to those identified above, or a failure to complete all corrective actions prescribed in the Consent Order (or other related actions that UChicago subsequently determines to be necessary) to prevent recurrence of the identified issues, the Office of Enforcement and Oversight may decide to pursue additional enforcement activity. The Office of Enforcement and Oversight, Office of Science, and ASO will continue to closely monitor UChicago's implementation of DOE's Nuclear Safety Requirements at Building 205 G-Wing and at other laboratory nuclear facilities.

Enclosed are two signed copies of the Consent Order. Please sign both, keep one for your records, and return the other copy to this office within 1 week from the date of receipt. By signing this Consent Order, UChicago agrees to perform the actions specified in section IV of the Consent Order.

If you have any questions, please contact me at (301) 903-2178, or your staff may contact Mr. Steven Simonson, Deputy Director for Enforcement, at (301) 903-7707.

Sincerely,



John S. Boulden III
Director
Office of Enforcement and Oversight
Office of Health, Safety and Security

Enclosure: Consent Order (NCO-2014-01)

cc: Joanna Livengood, ASO
Stuart Meredith, UChicago

In the matter of) Report No. NTS--ASO-ANLE-CSE-2013-0001
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UChicago Argonne, LLC)
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) Consent Order NCO-2014-01

CONSENT ORDER INCORPORATING AGREEMENT BETWEEN
U.S. DEPARTMENT OF ENERGY AND UCHICAGO ARGONNE, LLC

I

UChicago Argonne, LLC (UChicago) is the prime contractor responsible for the operation and maintenance of Argonne National Laboratory (ANL) Building 205. UChicago conducts operations and maintenance activities at ANL under Contract No. DE-AC02-06CH11357 (Contract) with the U.S. Department of Energy (DOE) Office of Science (SC). ANL is a multi-program SC laboratory with the primary mission of delivering breakthrough science and technology in the areas of basic energy sciences, energy efficiency and sustainable energy, and computational sciences. ANL has been involved in research and development activities on behalf of DOE and its predecessors since 1946. Building 205 is a DOE-owned nuclear facility where work has been conducted for the National Nuclear Security Administration (NNSA) Global Threat Reduction Initiative; the DOE Office of Nuclear Energy, Science and Technology; and NNSA in the areas of molybdenum (Mo-99) generation, nuclear fuel cycle work, and non-proliferation, respectively. In addition, laboratory experiments in Building 205 support national security work in nuclear forensics and nanoscale engineering.

II

Building 205 G-Wing has been operated as a radiological facility since 2008 when material was removed to reach a level below the established hazard category 3 (HC-3) threshold, based on the known inventory. As part of ongoing efforts to remove excess materials from Building 205 G-Wing, two gloveboxes were cleaned out and removed between October 2011 and September 2012. Subsequently, in January 2013, workers discovered plutonium salts caked on the internals of a Building 205 G-Wing furnace. These salts were analyzed and determined to contribute 0.22 of the HC-3 threshold inventory limit to the facility radiological inventory.

Following an independent assessment of the site-wide radioactive material inventory process and a determination of the amount of radiological waste previously removed from Building 205, UChicago notified DOE on March 28, 2013, that the legacy radioactive waste removed from

Building 205 G-Wing exceeded the HC-3 threshold inventory limit. This determination was made consistent with the requirement of 10 C.F.R. § 830.202, *Safety basis*, paragraph (b)(3), that DOE contractors use the methodology set forth in DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, Change Notice 1, to categorize DOE nuclear facilities. This exceedance, and the presence of other unmeasured residues, resulted in suspension of all operations in Building 205 (excluding K-Wing) by UChicago on April 1, 2013, due to concerns that the hazard categorization of the facility was incorrect.

UChicago's causal analysis identified six causal factors directly related to the event and five other factors that were determined to have contributed to the exceedance of the Building 205 G-Wing HC-3 threshold limit value. Specific deficiencies included: (1) less than adequate downgrade success criteria, which assumed that radioactive material holdup would be adequately accounted for in the facility radiological inventory administrative limit; (2) less than adequate utilization of programmatic staff and loss of process knowledge in the downgrade process; (3) lack of nuclear safety expertise; (4) informality of the approach used to downgrade G-Wing; (5) schedule pressure and lack of balanced priorities; (6) less than adequate project closeout and housekeeping; (7) incomplete radioactive material inventory tracking process; (8) less than adequate implementation of the radioactive material tracking process; (9) incomplete corrective action implementation; (10) less than adequate management oversight; and (11) less than adequate communication.

Before the notification to DOE on March 28, 2013, that Building 205 G-Wing had exceeded the lower HC-3 threshold inventory limit, independent assessments and DOE reviews had made UChicago aware of deficiencies at ANL related to the nuclear material inventory and holdup characterization. UChicago's corrective actions to address these deficiencies did not correct the problems in a timely manner and failed to prevent the exceedance of the Building 205 G-Wing HC-3 threshold inventory limit. While it is a positive that some of these issues were self-identified by UChicago through assessments, the Department believes that these issues were not given sufficient management attention.

UChicago voluntarily reported potential noncompliances with DOE Nuclear Safety Requirements associated with these issues into DOE's Noncompliance Tracking System (NTS) in report NTS--ASO-ANLE-CSE-2013-0001, *Legacy Glove Box Disposal Process Reveals Levels of Contamination in Two Glove Boxes That Exceed HC-3*.

On August 20, 2013, pursuant to 10 C.F.R. § 820.21(a), and based on the NTS report and discussions with the DOE Argonne Site Office (ASO) and SC, the Office of Enforcement and Oversight initiated an investigation into the nuclear material inventory and hazard categorization issues first communicated to DOE on March 28, 2013. The Office of Enforcement and Oversight's investigation identified several potential UChicago noncompliances with DOE Nuclear Safety Requirements. Specific deficiencies were evident in the areas of management programs, training, quality improvement, work processes, and safety basis maintenance.

In an October 14, 2013, letter to the Office of Enforcement and Oversight, UChicago requested a Consent Order based on the following: (1) a history of strong pro-active nuclear operations and

waste management performance; (2) an aggressive incident investigation, extent-of-condition review, and causal analysis; (3) a thorough nuclear materials inventory; and (4) comprehensive corrective action development to address the nuclear safety deficiencies identified above, including a site-wide nuclear material inventory characterization of 17 facilities.

III

Pursuant to 10 C.F.R. § 820.23, at any time during enforcement proceedings, DOE may resolve any or all 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.

To resolve the potential noncompliances with 10 C.F.R. Part 830 requirements, and in consideration of UChicago's request for settlement and UChicago's investigation, causal analysis, and associated corrective actions taken since the submission of the NTS report referenced above, DOE has elected to enter into settlement. DOE and UChicago 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, the following terms represent agreement by the authorized representatives of DOE and UChicago to resolve by settlement the potential noncompliances at the ANL Building 205 G-Wing, in lieu of an enforcement action that DOE may issue pursuant to 10 C.F.R. § 820.24.

1. UChicago shall fully implement the *Corrective Action Plan for Building 205*, dated June 28, 2013, and the *Residual Contamination Characterization Extent of Condition Project Implementation Plan*, dated October 11, 2013, and shall include the following enhancements in their corrective action plans and provide the specified deliverables:
 - (a) Within 9 months of the effective date of this Consent Order, UChicago shall conduct an independent (external to UChicago) assessment of the effectiveness of all corrective actions that are identified in the *Corrective Action Plan for Building 205*, dated June 28, 2013, and that have been completed;
 - (b) Within 1 year of the effective date of this Consent Order, UChicago shall brief the Office of Enforcement and Oversight, SC, and ASO on the results of this independent assessment of corrective action effectiveness (including a specific discussion of the demonstrated effectiveness of actions taken to improve the accuracy and integrity of the Radioactive Material System inventory), the status of all corrective actions remaining open (including a discussion of any extension(s) granted for the original corrective action target completion dates), and the status of UChicago efforts in assigning residual radiological inventory values to ANL radiological and HC-3 nuclear facilities; and

- (c) On a yearly basis, from the effective date of this Consent Order, UChicago shall provide to the Office of Enforcement and Oversight, SC, and ASO the results of the inventory characterization activities for the 17 buildings identified in the *Residual Contamination Characterization Extent of Condition Project Implementation Plan*, dated October 11, 2013, and any additional buildings selected for radioactive material characterization. The annual briefing on these results will continue until full completion of all activities addressed in the Extent-of-Condition Plan.
2. In lieu of the issuance of an enforcement action with the proposed imposition of a civil penalty pursuant to 10 C.F.R. § 820.24, DOE has entered into this Consent Order with UChicago. In addition, in consideration of the \$298,920 contract fee reduction that DOE has imposed for the circumstances leading to the HC-3 exceedance, DOE has decided to exercise enforcement discretion in suspending the monetary remedy that would otherwise be imposed under this Consent Order.
 3. UChicago agrees to return a signed copy of this Consent Order, within 1 week from the date of receipt, to the following address:

Director, Office of Enforcement and Oversight
Attention: Office of the Docketing Clerk, HS-40
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290
 4. The effective date of this Consent Order shall be the date upon which UChicago signs this Consent Order.
 5. This Consent Order shall constitute a full and final settlement of the potential noncompliances identified in the referenced NTS report, subject to: (a) UChicago's completion of all actions set forth in item 1 above in the manner prescribed therein, and (b) the provisions of item 11, below.
 6. Pursuant to the Major Fraud Act, as amended, 41 U.S.C. § 4310, and the implementing provisions of the Federal Acquisition Regulation, 48 C.F.R. § 31.205-47, the costs incurred by, for, or on behalf of UChicago that are directly attributable to supporting DOE's investigation, including coordination and cooperation with DOE concerning the matters covered by this Consent Order, shall not be considered allowable costs under the Contract. However, costs incurred by, for, or on behalf of UChicago relating to the development and implementation of corrective actions, including costs associated with the independent effectiveness review required under item 1 above, shall 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. § 820.24 with respect to a potential noncompliance with regard to Building 205 if, after the effective date (as defined in item 4 above), DOE becomes aware of any false or materially inaccurate facts or information provided by UChicago, or

UChicago fails to complete all actions identified in item 1 in the manner prescribed therein; nor does it preclude DOE from re-opening the investigation or issuing an enforcement action under 10 C.F.R. § 820.24 with regard to the buildings subject to the extent-of-condition review identified in the UChicago's *Corrective Action Plan for Building 205*, dated June 28, 2013, if there is a recurrence of nuclear safety deficiencies similar to those identified above, or material inventory characterization data reveals that an exceedance of the HC-3 or HC-2 lower threshold inventory limit has occurred.

8. Any modification to this Consent Order requires the written consent of DOE and UChicago.
9. UChicago 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 legal means.
10. 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.
11. 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 and Oversight'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 organization, I hereby agree to and accept the terms of the foregoing Consent Order.

FOR U.S. Department of Energy:

FOR UChicago Argonne, LLC:

 Date 4/2/14

John S. Boulden III
 Director
 Office of Enforcement and Oversight
 Office of Health, Safety and Security
 U.S. Department of Energy

 Date 4/8/14

Peter B. Littlewood
 Director
 Argonne National Laboratory
 and President, UChicago Argonne, LLC