



Department of Energy
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
Washington, DC 20585



June 14, 2016

Dr. Charles F. McMillan
President and Laboratory Director
Los Alamos National Security, LLC
Mail Stop A-100, Drop Point 03140071S
Bikini Atoll Road, TA-3
Los Alamos, New Mexico 87545-1663

NCO-2016-03

Dear Dr. McMillan:

The Office of Enterprise Assessments' Office of Enforcement has completed its investigation into the facts and circumstances associated with the losses of contamination control of highly enriched uranium at the Nevada National Security Site's National Criticality Experiments Research Center at the Device Assembly Facility on June 16, 2014, and October 21, 2014. Los Alamos National Security, LLC (LANS) documented these events into the Department of Energy's (DOE) Noncompliance Tracking System under report NTS--LASO-LANS-BOP- 2015-0001, dated January 14, 2015.

On June 16, 2014, National Security Technologies, LLC (NSTec) radiation control technicians (RCTs) discovered radiological contamination outside the previously-identified Godiva critical assembly device (Godiva) contamination area. Subsequent bioassays of potentially affected personnel revealed that 31 tested positive for uranium intakes. The assessed doses ranged from less than 0.001 rem to 0.131 rem committed effective dose (50 year). On August 7, 2014, the National Nuclear Security Administration (NNSA) Nevada Field Office (NFO) paused Godiva operations after receiving notification of the initial positive bioassay results. On October 21, 2014, RCTs detected small amounts of contamination outside the previously-identified contamination area for the Flattop critical assembly device during radiological surveys conducted in response to the Godiva spread of contamination event.

DOE and NNSA consider these events to be safety significant and preventable. LANS did not effectively implement controls to protect workers from airborne contamination emanating from Godiva and actions taken in response to increasing indications of spread of contamination resulting from Godiva operations were inadequate. However, subsequent actions taken following the August 7, 2014, pause in Godiva operations were prompt and comprehensive.



In accordance with 10 C.F.R. § 820.23, *Consent Order*, DOE and NNSA have 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 and NNSA placed considerable weight on the cooperative approach taken by LANS in working with NSTec in identifying causal factors contributing to the events and implementing an appropriate set of corrective actions to prevent recurrence.

DOE reserves the right to re-open this investigation if DOE later becomes aware that LANS 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 in the Consent Order (or other related actions that LANS 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, NNSA Headquarters, NFO and the NNSA Los Alamos Field Office will continue to closely monitor LANS's implementation of DOE nuclear safety 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 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 Mr. Jon Thompson, Director, Office of Nuclear Safety Enforcement, at 301-903-1134.

Sincerely,



Frank G. Klotz
Administrator
National Nuclear Security Administration



Steven C. Simonson
Director
Office of Enforcement
Office of Enterprise Assessments
U.S. Department of Energy

Enclosure: Consent Order (NCO-2016-03)

cc: Kimberly Davis Lebak, NA-LA
Rachel Schroeder, LANS

In the matter of) Report No. NTS--LASO-LANS-BOP-2015-0001
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Los Alamos National)
Security, LLC)
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) Consent Order NCO-2016-03

CONSENT ORDER INCORPORATING AGREEMENT BETWEEN THE U.S.
DEPARTMENT OF ENERGY, THE NATIONAL NUCLEAR SECURITY
ADMINISTRATION, AND LOS ALAMOS NATIONAL SECURITY, LLC

I

Los Alamos National Security, LLC (LANS) is responsible for conducting programmatic work and nuclear operations at the Department of Energy's (DOE) National Nuclear Security Administration (NNSA), National Criticality Experiments Research Center (NCERC), within the Device Assembly Facility (DAF) at the Nevada National Security Site. LANS is a Secondary Real Estate Operations Permit (REOP) holder under Contract No. DE-AC52-06NA25396 (Contract) entered into with NNSA.

II

Operations conducted at NCERC include both subcritical and critical experiments that can measure a wide variety of nuclear properties. National Security Technologies, LLC (NSTec) is responsible for managing and operating DAF as the Primary REOP holder, and LANS is responsible for conducting programmatic work and nuclear operations within NCERC as the Secondary REOP holder.

In September 2013, following a formal startup process and authorization, NCERC operators began bare burst operations at the Godiva critical assembly device (Godiva). During April and May 2014, there was an increased campaign of Godiva burst operations, some of which were in the upper energy range of Godiva's normal operating range.

On June 16, 2014, NSTec radiation control technicians (RCTs) conducted a survey that led to the discovery of radiological contamination outside the previously-identified Godiva contamination area. NSTec reported the survey results to LANS on June 26, 2014. LANS then directed the RCTs to conduct further surveys to investigate the source of the contamination.

On July 17, 2014, Lawrence Livermore National Laboratory (LLNL) notified NSTec and LANS management that one of its experimenters, working in the vicinity of Godiva, had received a positive result on a routine bioassay. This notification led NSTec management to initiate

bioassays for the three RCTs assigned to support NCERC operations. These results were also positive. Based on the positive bioassay results, LANS initiated special bioassays for additional personnel who worked in the vicinity of Godiva. Over the course of the special bioassays, 97 personnel who could have been affected by the spread of radiological contamination resulting from Godiva operations were tested. Of these, 31 tested positive for uranium intakes. The assessed doses ranged from less than 0.001 rem to 0.131 rem committed effective dose (50 year).

On August 7, 2014, NNSA Nevada Field Office (NFO) senior management paused Godiva operations after being notified of the positive bioassay results from the LLNL experimenter and the NSTec RCTs.

On October 21, 2014, RCTs detected small amounts of contamination outside the previously-identified contamination area for the Flattop critical assembly device (Flattop) during radiological surveys being conducted in response to the Godiva spread of contamination event. On October 29, 2014, LANS management paused Flattop programmatic operations. Although no formal causal analysis was performed for this event, the identified issues and causes would likely have been bounded by those from the Godiva event, and the corrective actions taken were largely common for both events.

Godiva was originally located at the Los Alamos Critical Experiments Facility (LACEF) located in Technical Area 18 at Los Alamos, New Mexico. Its operating conditions at LACEF differed from those at NCERC. LACEF personnel recognized that Godiva could spread airborne radiological contamination and took measures to protect personnel from this hazard. One such measure was a Godiva design feature called "Top Hat," a type of shroud designed for security reasons, but which also served as physical protection from the release of small nuclear material particulates during Godiva burst operations. In addition, LACEF implemented routine housekeeping and contamination control at the area around the device to prevent the buildup and spread of contamination. While NCERC personnel recognized the potential for airborne contamination, actions taken to control the hazard at NCERC were inadequate. The "Top Hat" was not installed before Godiva operations began at NCERC in September 2013, and there was no emphasis on routine decontamination around Godiva following burst operations. NCERC personnel took these actions without fully understanding the impacts on contamination control resulting from the static airflow in the area surrounding Godiva.

The LANS causal analysis for the spread of radiological contamination at Godiva identified 12 issues and 26 contributing causes. Some of the identified issues were: workplace monitoring insufficient to adequately identify the airborne hazard; worker radiological monitoring insufficient to avoid personnel intakes; ineffective communication among organizational entities performing work in DAF; hazard identification inadequate for NCERC operations at DAF; hazard controls insufficiently defined and implemented during all project phases for the DAF NCERC buildings; and line management event response that was slow and continued to be less than adequate until senior management engagement.

LANS voluntarily reported potential noncompliances associated with this event into the DOE Noncompliance Tracking System (NTS) in report NTS--LASO-LANS-BOP-2015-0001, *Programmatic Concerns With Management System Integration and Contamination Control at the Device Assembly Facility*.

On June 9, 2015, pursuant to 10 C.F.R. § 820.21(a), and based on the NTS report and discussions with NFO and NNSA Headquarters, the Office of Enforcement initiated an investigation into the Godiva spread of contamination event. The Office of Enforcement's investigation identified several potential noncompliances with DOE nuclear safety and occupational radiation protection requirements. Specific deficiencies were evident in the areas of quality improvement, written procedures, monitoring of individuals and areas, air monitoring, and maintaining radiation exposure in controlled areas as low as reasonably achievable through engineered and administrative controls.

In a July 28, 2015, letter to the Office of Enforcement, LANS requested a Consent Order because of the following actions LANS had taken: (a) collaborating with NSTec in reporting into the NTS; (b) performing a thorough causal analysis; (c) performing an extent-of-condition review and pausing operations at Flattop based on common concerns; (d) collaborating with NSTec in developing and implementing a broad corrective action plan (CAP); (e) effectively implementing improvements in radiological control and management practices at NCERC; (f) decontaminating affected areas and maintaining the reduced contamination levels; (g) receiving NFO's authorization to resume Comet operations; and (h) continuing on schedule to complete work on Federal readiness assessment pre-start findings and the remaining open corrective actions.

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 LANS's investigation, causal analyses, and associated corrective actions since the submission of the NTS report referenced above, which DOE and NNSA found to be comprehensive and appropriate, DOE and NNSA have elected to enter into settlement. DOE, NNSA, and LANS 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, NNSA, and LANS (hereinafter the "Parties"), the following terms represent agreement by the authorized representatives of the Parties to resolve by settlement the potential noncompliances at NNSS, in lieu of an enforcement action that NNSA may issue pursuant to 10 C.F.R. § 820.24.

1. LANS shall fully complete and implement all corrective actions previously committed to in its CAP and entered into NTS. LANS shall ensure that its planned CAP commitments address the following areas of emphasis:
 - a. LANS shall arrange for an independent party (outside of LANS) to conduct its planned effectiveness review of the corrective actions taken to address these issues, and will provide the results to the Office of Enforcement, NFO, the NNSA Los Alamos Field Office, and NNSA Headquarters within 24 months of the Effective Date of this Consent Order as defined in item 4 below.
 - b. LANS shall ensure engineered as low as reasonably achievable controls are used to minimize potential for airborne contamination during Godiva operations as evaluated during the Godiva Startup Plan and approved by NFO.
 - c. LANS shall ensure that workplace monitoring is conducted to promptly identify and communicate area and airborne contamination, including contamination surveys, air monitoring, and air sampling in accordance with revised and approved radiation protection requirements.

The delivery and acceptance of the effectiveness review results (referenced in item 1a above) by the aforementioned parties satisfies the completion of the actions included in item 1.

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 and NNSA have entered into this Consent Order with LANS. In addition, in consideration of the \$500,000 contract fee reduction that NNSA has imposed for the circumstance leading to the spread of radiological contamination at NCERC, DOE and NNSA have decided to exercise enforcement discretion in not assessing the monetary remedy that would otherwise be imposed under this Consent Order.
3. LANS 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
Attention: Office of the Docketing Clerk, EA-10
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290
4. The Effective Date of this Consent Order shall be the date on which LANS 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 LANS's completion of all actions set forth in item 1 above to the satisfaction of the Office of Enforcement and NNSA.

6. No costs, as defined in the Federal Acquisition Regulation, 48 C.F.R. § 31.205-47, incurred by, for, or on behalf of LANS 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 LANS 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.
7. This Consent Order does not preclude DOE from re-opening the investigation nor preclude NNSA from 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 4 above), DOE or NNSA becomes aware of any false or materially inaccurate facts or information provided by LANS related to this Consent Order; or (b) LANS fails to complete all actions identified in item 1 above in a timely and effective manner to prevent recurrence of the identified issues. Moreover, nothing in this Consent Order precludes DOE from additional enforcement action should LANS commit nuclear safety deficiencies similar to those identified at NCERC at any time after the Effective Date of this Consent Order.
8. Any modification to this Consent Order requires the written consent of all Parties.
9. LANS waives any and all rights to appeal or otherwise seek judicial or administrative review of the terms of this Consent Order.
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 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'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 National Nuclear Security
Administration

FOR Los Alamos National Security, LLC

Frank G. Klotz Date 6/10/2016
Frank G. Klotz
Administrator
National Nuclear Security Administration

Dr. Charles F. McMillan Date 6/20/16
Dr. Charles F. McMillan
President and Laboratory Director
Los Alamos National Security, LLC

FOR U.S. Department of Energy

Steven C. Simonson Date 6/14/2016
Steven C. Simonson
Director
Office of Enforcement
Office of Enterprise Assessments
U.S. Department of Energy