UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

July 24, 2009

U.S. Department of Commerce
National Institute of Standards and Technology
ATTN: Richard F. Kayser, Ph.D.
Chief Scientist
325 Broadway, MC 815.00
Boulder, Colorado 80305-3328

SUBJECT: NRC REVIEW OF FINAL STATUS SURVEY REPORT

Dear Dr. Kayser:

As stipulated in Condition 6 of the Confirmatory Action Letter (CAL) issued by the NRC on July 2, 2008, you submitted a Final Status Survey Report (FSSR) by letter dated May 29, 2009. The staff from NRC and the Oak Ridge Institute for Science and Education (ORISE) reviewed the FSSR and requested additional information in a letter dated June 29, 2009. You submitted a revised Final Status Survey Report (FSSR) dated July 8, 2009, to the NRC for review. In your report, you provide the radiological survey results following decontamination for building surfaces and soils at your Boulder, Colorado, facility. These surveys were conducted in response to the plutonium spill that occurred on June 9, 2008.

In the FSSR, you conclude that the sample results obtained are less than the NRC-approved acceptance criteria. Accordingly, you requested NRC's review of the FSSR, and you requested authorization to allow all areas previously impacted by the plutonium spill to be free-released for unrestricted use. In response to your requests, we compared the FSSR to NRC guidance documents. We also reviewed the results of previous in-process inspections and NRC confirmatory surveys. The details of our review are provided in the Enclosure to this letter.

In summary, the information provided in the FSSR, as supplemented by information gained during in-process inspections and confirmatory surveys, provides reasonable assurance that all areas previously impacted by the plutonium spill are in compliance with the criteria specified in 10 CFR Part 20, Subpart E. Since the results of the final status survey demonstrate that the areas meet the radiological criteria specified in Subpart E, release of the facility is at your discretion.

While you have addressed Condition 6 of the CAL, please note that the CAL remains open until NRC has determined that your long term corrective actions have been implemented. Closure of the CAL will be documented under separate correspondence after NRC has assessed the effectiveness of your corrective actions.

Additional details regarding our independent inspection of the decontamination of your facility, as well as the other findings and conclusions of our special inspection of the plutonium contamination event will be discussed with you at a public meeting in Boulder during the month

of September 2009. The schedule and details of this meeting will be promulgated under separate correspondence. Subsequent to this meeting, the NRC will issue a publically available inspection report that documents our inspection results.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC's Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this letter, please contact Ms. Vivian H. Campbell of my staff at (817) 860-8287.

Sincerely,

/RA D. Blair Spitzberg for/

Arthur T. Howell, Director
Division of Nuclear Materials Safety

Docket: 030-03732
License: 05-03166-05

Enclosure:
Safety Evaluation Report

cc w/enclosure:
Colorado Radiation Program Director
City of Boulder, City Manager

bcc w/enclosure (via e-mail distribution):
ATHowell
CLCain
VHCampbell
RLeonardi
RJEvans
JLThompson
JEWhitten
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APowell, OCA
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Safety Evaluation Report

Background

On June 9, 2008, a glass vial containing approximately 0.25 grams of mixed plutonium isotopes was ruptured at the National Institute of Standards and Technology (NIST) facility in Boulder, Colorado. The spill resulted in the contamination of several areas within the NIST facility. In response to this event, the NRC issued a Confirmatory Action Letter to the licensee on July 2, 2008 (ADAMS Accession Number ML081840441). Condition 6 of the Confirmatory Action Letter, in part, committed the licensee to provide the NRC with a written report documenting the results of the final status surveys following decontamination activities.

As stipulated by Condition 6, NIST submitted a Final Status Survey Report (FSSR) to the NRC by letter dated May 29, 2009 (ML091820146). The FSSR was reviewed by staff from NRC and the Oak Ridge Institute for Science and Education (ORISE). The staff requested additional information from the licensee in a letter dated June 29, 2009 (ML091801082). The licensee subsequently updated the FSSR and submitted Revision 1 of the FSSR to the NRC by letter dated July 8, 2009 (ML092010497).

Proposed Action

The licensee's proposed action is to free-release the formerly plutonium contaminated areas for unrestricted use. Upon NRC acceptance of the FSSR results, the licensee plans to release the areas for use by NIST employees and contractors. This safety evaluation is the staff's analysis of the radiological consequences of the licensee's proposed action. The purpose of this evaluation is to determine if the proposed action can be safety accomplished.

Safety Evaluation

The FSSR provides the results of the final status surveys that were conducted by the licensee to document the radiological status of its facility following decontamination. The purpose of this technical evaluation is to verify if the results of the final status survey demonstrate that the areas previously contaminated by the plutonium spill meet the radiological criteria for unrestricted use.

During this evaluation, NRC staff considered the guidance provided in NUREG-1757, Volume 2, Revision 1, "Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria." In particular, the NRC staff compared the FSSR results to the evaluation criteria provided in Section 4.5, Final Status Survey Report, of NUREG-1757, Volume 2.

Section 4.5.2 of NUREG-1757 provides guidance on the types of information that are required to be submitted to the NRC in FSSRs. The requested information includes an overview of the survey results, the derived concentration guideline levels (DCGLs) that were used, and the survey results for each survey unit. The NRC staff conducted an acceptance review of the FSSR and concluded that the requested information had been provided by the licensee.

The licensee proposed soil and surface DCGLs as part of its revised Plutonium Spill Recovery Work Plan (ML090020007). The NRC conducted a technical review of the work plan and the proposed DCGLs during January 2009. The results of this review were documented in an NRC Memorandum (ML090240005). The NRC subsequently approved the revised document and the proposed DCGLs via License Amendment 34 dated January 24, 2009 (ML090240009).

This license amendment authorized a building surface DCGL of 696 disintegrations per minute per 100 square centimeters for alpha particulate contamination and a soil DCGL of 0.42 picocuries of americium-241 radioactivity per gram of soil.

The licensee conducted the final status surveys from February 25, 2009, through April 7, 2009. The results of these surveys were included in the FSSR. The licensee and the licensee's contractor conducted 304 surface scans and collected 353 fixed point measurements, 353 removable contamination measurements, and 30 soil samples. The FSSR documents that all sample results are less than the NRC-approved DCGLs. Accordingly, the licensee concludes that the areas previously impacted by the plutonium spill meet the NRC's criteria for unrestricted use. During the review of the FSSR, the NRC staff confirmed that all sample results were less than the respective DCGLs.

The NRC conducted four in-process and confirmatory surveys between September 8, 2008, and April 16, 2009. The NRC's preliminary in-process and confirmatory survey results indicate that the areas formerly contaminated by the plutonium spill had been decontaminated to less than the NRC-approved DCGLs. The NRC's survey results will be documented in a report that will be issued at a later date.

During the April 13-16, 2009, inspection, the NRC was supported by representatives from ORISE, an NRC contractor specializing in radiological surveys.. The results of the ORISE survey were documented in a confirmatory survey report to the NRC dated June 24, 2009 (ML092010497). The surveys conducted by ORISE included surface scans for alpha and gamma contamination, direct measurements for gross alpha activity, and analyses of soil samples for americium-241 radioactivity. The ORISE report concludes that all sample results are below the respective DCGLs. Further, the confirmatory survey results obtained by ORISE were found to be in agreement with the results presented in the licensee's preliminary final status survey data packages.

The NRC staff also compared the FSSR results to the guidance provided in NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." The staff concluded that the licensee created a sufficient number of survey units and collected a sufficient number of samples as recommended in MARSSIM. Further, NRC and ORISE staff conducted onsite reviews of the licensee's implementation of the final status survey during the April 2009 inspection. The inspection included a review of instruments used during the final status survey and the quality control methodologies. The staff concluded that the licensee's procedures and methods were appropriate.

Conclusions

The NRC staff concludes that the FSSR provides a sufficient basis to allow the licensee to free-release the areas previously impacted by the plutonium spill for unrestricted use. The information provided by the licensee in the FSSR, as supplemented by information gained during in-process inspections and confirmatory surveys as well as the licensee's response to the NRC's request for additional information, provides reasonable assurance that all areas previously impacted by the plutonium spill are in compliance with the criteria specified in 10 CFR Part 20, Subpart E.