From:	Jon Stoner
To:	Katanic, Janine; Silva, Patricia
Cc:	Donna Lybecker; John Longley
Subject:	[External_Sender] ISU Effectiveness Review re: Confirmatory Order EA-18-153
Date:	Tuesday, September 29, 2020 4:34:14 PM
Attachments:	ISU Effectiveness Review.pdf

Dear Dr. Katanic and Ms. Silva,

Please find attached ISU's periodic review of actions in accordance with Confirmatory Order EA-18-153 and the independent audit. Mr. Longley is currently out on sick leave, however, if you have questions, comments or additional requirements, please contact me.

Thank you,

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Effectiveness Review

Idaho State University

Confirmatory Order EA-18-153

October 1, 2020

Introduction

ISU performed an assessment to evaluate the status of corrective actions specified in the corrective action plan completed in March 2020. The assessment evaluated all documentation related to corrective actions and was conducted by a team of three members John Longley, RSO, Jon Stoner, Chairman of the RSC, and Steve Snay, independent reviewer from Rad Compliance LLC. Dr. Snay did not travel to ISU to minimize potential exposure to COVID-19. Results of the assessment are documented in the following sections and follow the outline of the corrective action plan.

This document is organized to follow the outline of the corrective action plan. It is divided into three sections, Programmatic Corrections, violations from enforcement action E-18-153, and improvements recommended by the independent assessment. Status is given for each item as complete, in progress or complete (routine) which indicates the program change is complete but implementation is part of the routine program. In subsequent effectiveness reviews, complete items will not be included but items in progress and complete (routine) will continue to be evaluated. The table at the end of the document is the milestone summary from the corrective action plan updated with current status.

1. Programmatic Corrections

1.1. Management Commitment

As part of the management commitment to remove excess radioactive material, ISU Radiation Safety Personnel have decommissioned a number of labs in the EAMES Building (RAM storage cage, the radiochemistry lab, the crystal lab, and the pumpkin room), the Pharmacy Building (B-1), Gale Life Sciences Building (Ac-170, 345, 462, 463B), CAES Building (115), Center for Higher Education (102B) and Physical Sciences (340B). In addition the radiation safety department removed significant excess material for disposal including approximately 323 kg of depleted uranium from EAMES and IAC and excess sources (< 100 uCi) from the IAC and radiation safety department. In addition, 119 historical samples (2013 to 2018) were transferred from the MaCS laboratory at CAES to the National Science User Foundation laboratory at INL. These removals reduce radiological risk for the ISU program.

Documents reviewed:

- Waste manifests.
- Bill of lading for shipment out of MaCS at CAES

Status: Complete

1.2 Insufficient Staffing

A radiation safety specialist was hired on April 6, 2020 to support radiation safety operations on the Pocatello campus. In addition, two student employees were hired to support the CAES facility in August 2020. The radiation safety/industrial hygiene specialist for the CAES facility has

been delayed because of COVID-19, but the hiring process will resume when approved by the State of Idaho.

Status: in progress

1.3. Inadequate Program Documents and Procedures

In addition to the documents listed as revised in the corrective action plan, the Radiation Safety Department has updated the following procedures and posted them on the Radiation Safety Website.

Documents reviewed:

- RS-02, Dosimetry, 4/1/20 On website
- RS-06, Radioactive Material Laboratory Evaluations, 7/1/20 On website
- Rs-09, Radioactive Waste Management, 6/22/20 On website
- RS-21, Radiation Safety Technician Qualifications, 6/23/20 On website

Status: In progress

1.4. Inadequate Training

Radiation Safety Department personnel conducted training for authorized users in February 2020 and it will be repeated on an annual basis in February. In addition, the Radiations Safety Department developed a procedure to formalize qualification for technicians in the department, RS-21, Radiation Safety Technician Qualifications. Implementation of this procedure will continue in fiscal year 2021. ISU is working to update the on-line training for radiation workers.

Documents reviewed:

- Authorized user training power point.
- Qualification procedure implementation table

Status: In progress

1.5. Improve Tracking of Radioactive Material

ISU completed the physical inventory of all radioactive materials and nuclear materials on the broad scope and isotope production licenses in June 2020. Nuclear materials on the reactor and SNM licenses were inventoried in May 2020 rather than the scheduled time in March 2020 because of COVID 19 shutdown of the reactor laboratory.

The NRC inspection in March 2020 identified two issues regarding nuclear material inventory. First the independent inventory conducted as part of the confirmatory order did not include materials from the reactor and SNM licenses. ISU contracted Porter House Inc., to complete the independent inventory of these materials in June of 2020. All materials were confirmed. Second, the SNM masses for materials on the reactor license did not agree with the mass in the NMMSS database. ISU conducted a full physical inventory of all materials on the reactor license including

mass and gamma spectroscopy measurements and complete review of historical receipt and inventory records. This inventory rectified the discrepancies and the U-235 mass agreed with NMMSS to less than 0.5 grams.

Documents reviewed:

- June inventory reports
- Additional independent inventory
- Confirmation of reactor SNM.

Status: Complete (routine)

1.6. Internal Assessments

The Radiations Safety Officer and Radiation Safety Committee Chairman conducted their internal assessments in June of 2020. Additional members of the Radiation Safety Committee were unable to participate because of COVID 19 work restrictions.

Documents reviewed:

- RSO and RSCC assessments from 6/20.

Status: Complete (routine)

1.7. Scheduling and Tracking of Radiation Safety Tasks

The Radiation Safety Department follows the detailed monthly schedule. There have been some missed items because of COVID 19 disruptions.

Documents reviewed:

- Monthly schedules.

Status: Complete (routine)

2. Specific Violations September 2018 Inspection

2.1. Level III Violation

ISU transferred all radioactive gauge sources to other licensees. In addition, the renewal for the broad scope license does not include gauge sources.

Documents reviewed:

- Data showing transfer of density gauges.

Status: Complete

2.2. Labeling Containers

ISU implemented a query system from the HPAssist database to determine radionuclide inventory and radiation safety technicians perform dose rate surveys to complete the forms to give complete information required by 10 CFR 20.

Documents reviewed:

- Photographs of sample containers from CAES and IAC.

Status: Complete (routine)

2.3. Radioactive Material Inventory not implemented for each item

ISU completed radioactive material inventory in accordance with procedure EHS-09-16, Rev2, Radioactive Material Inventory. The special nuclear material inventory for the reactor and SNM licenses was delayed from March 2020 to May 2020 because of COVID-19 shutdown.

Documents reviewed:

- Procedure EHS-09-16, Rev. 2 on web.
- June inventory documentation from 1.5 above.

Status: Complete (routine)

2.4. Contamination Area Accessible without EH&S Supervision

ISU modified the Radiation Safety Manual to control access to Contamination Areas through an RWP system as specified in procedure RS-14, Rev. 0, Radiological Work Permits and Section 11 of the Radiation Safety Manual. RWPs were developed for Contamination Areas in the White Room Cave and the Cu-67 processing laboratory and contaminated equipment forms were developed for gloveboxes in the Advanced Materials Lab and Radiochemistry Lab at CAES, and the Crystal Lab glove box at EAMES.

Documents reviewed:

- RWPs and Contaminated Equipment Forms.

Status: Complete

2.5. Decommissioned Lab with No Postings and Had No Surveys

ISU updated procedure, RS-17 Rev. 0, Decommissioning Survey, to provide instructions for decommissioning of individual laboratories. Using the procedure ISU completed decommissioning surveys for labs in the EAMES Building (RAM storage cage, the radiochemistry lab, the crystal lab, and the pumpkin room), the Pharmacy Building (B-1), Gale Life Sciences Building (AC-170, 345, 462, 463B), CAES Building (115), Center for Higher Education (102B) and Physical Sciences (340B). For the laboratory in Meridian noted in the NRC inspection of September 2018, ISU used the final operational survey as the decommissioning survey because the laboratory had already been repurposed and no significant material remained. Finally ISU maintains a list of facilities decommissioned with dates of completion along with facilities currently in use that will eventually require decommissioning as required in 10 CFR 30.

Documents reviewed:

- Decommissioning survey procedure. RS-17 on website.
- Decommissioning survey for Meridian lab.
- Decommissioning list.
- Decommissioning surveys (CHE 102B, GLS 463B, EAMES crystal lab)

Status: Complete (routine)

2.6. Transfers to INL Not Authorized by RSO

Requirements for authorization for transfer of radioactive material are specified in Section 9.2 of the Radiation Safety Manual and in Procedure RS-08, Transport of Radioactive Material, and require written authorization from the RSO on Form RPR-14. This process is fully implemented for transfers and shipments.

Documents reviewed:

- Procedure RS-08 and Form RPR-14 (On website)
- RPR-14 Forms 2020

Status: Complete (routine)

2.7. Postings for Radioactive Material Areas

ISU clarified requirements for radiological postings in Section 10.3 of the Radiation Safety Manual and specified a minimum size for Caution Radioactive Material postings. Postings are reviewed as part of the laboratory inspection process. At the IAC, ISU controlled the high bay as a Radiation Use Area (Material) to store radioactive waste and activated equipment from accelerator operations. An additional storage area was created in a shipping container adjacent to the IAC. Both areas are properly posted with Caution Radioactive Material warnings.

Documents reviewed:

- Photos of high bay and container postings.

Status: Complete

2.8. No Posting of Contamination Control Area

The definition for Contamination Control Area was replaced with Radiation Use Area (Material) in Section 10.3 of the Radiation Safety Manual. Postings for Radiation Use Areas (Material) were implemented as described in Section 2.7 above.

Documents reviewed:

- Radiation Safety Manual Rev 13.

Status: Complete

2.9. Area Surveys and Contamination Surveys Not Conducted at Appropriate Frequency

ISU updated the survey frequency requirements in the Radiation Safety Manual. Immediate work area surveys are required at the end of the day after all use of dispersible radioactive material. Formal map surveys are performed by the authorized user at the frequency specified in the user permit. Survey frequencies are verified in the laboratory inspections.

Documents reviewed:

- Laboratory Inspection Forms March through July.
- Permit examples.

Status: Complete (routine)

2.10. Testing of Fume Hoods Not Conducted Annually

ISU added a monthly check to the master schedule to verify upcoming fume hood tests and developed an independent list of fume hoods used for radioactive material with test dates.

Documents reviewed:

- Monthly detail schedule
- Fume hood list

Status: Complete (routine)

2.11. Radiation Safety Audit Did Not Audit the Program Content and Implementation

ISU developed procedure EHS-19-01, Rev. 0, Radiation Safety Program Oversight, to guide the annual assessment of the Radiation Safety Program in accordance with the guidance of NUREG 1556. The RSO and Radiation Safety Committee completed reviews of the radiation safety program in the second quarter of 2020.

Documents reviewed:

- EHS-19-01 Rev-0 on web.
- RSO and RSCC assessments from 6/20 See 1.6.

Status: Complete (routine)

3. Recommendations from Independent Assessment

3.1. All Program Commitments from Licenses.

ISU submitted a renewal application for the broad scope license in January 2020 and two additional submissions to address questions raised by the NRC. These will form the complete history for the renewed broad scope license in Amendment 39. ISU has submission history for isotope production and reactor licenses but not the SNM license. ISU requested original submission information for the SNM license from the NRC and received the application form February 2009.

Documents reviewed:

- SNM-1373 License application February 2009

Status: In progress

3.2. Lyris Subscription Service

ISU subscribed to the NRC Lyris notification system.

Status: Complete

3.3. Remove Radiation Workers

ISU added verification of radiation workers on the monthly schedule for May to coincide with the end of the academic year. Each May, the Radiation Safety Department will contact all authorized users to determine which radiation workers should be maintained. The initial reduction in radiation workers was conducted in May 2020.

Documents reviewed:

- Monthly schedule in May of each year. See 1.7.
- Example E-mails.

Status: Complete (routine)

3.4. Radiation Safety Training

ISU is working to update the radiation safety training and move it to Moodle to correct the testing issue. Completion and implementation is expected in December 2020.

Status: In progress

3.5. Credentialing Document

ISU developed procedure, RS-21, Rev 0, Radiation Safety Technician Qualifications, to formalize the qualification of technicians in the ISU Radiation Safety Department and developed a workbook to track the process for each student technician in the department. ISU will work to complete the specific qualification process for each student technician in Idaho fiscal year 2021.

Documents reviewed:

- Procedure RS-21 on Web
- Qualification procedure implementation table See 1.4

Status: In progress

3.6. ALI Ratio

ISU updated the requirements for user surveys to require immediate use surveys whenever dispersible radioactive materials are handled and for formal map surveys at the frequency specified in the authorized user permit. This simplifies survey frequency and removes the requirement for computing ALI ratios.

Documents reviewed:

- Example permits. See 2.9.

Status: Complete

3.7. Survey Record Forms

ISU is updating Procedure RS-03, Radiological Surveys. The revised procedure provides separate forms for confirmatory surveys, user formal map surveys, release surveys, and transportation surveys. Program numbers and instrument details are included on the survey forms where applicable.

- Example of user permits.
- Draft Procedure RS-03

Status: In progress

3.8. Reduction in Dosimetry

ISU evaluated all programs to determine if radiation workers required Landauer dosimetry. This evaluation considered the requirements for monitoring in Section 15.1 of the Radiation Safety Manual and historical doses measured over an approximate three year period. A number of radiation workers were identified who no longer required dosimetry. Authorized users and radiation workers were sent a memorandum informing them of the decision and the rationale for discontinuing monitoring.

Documents reviewed:

- Rationale memos for dosimetry reduction.

Status: Complete

3.9. Dosimetry Evaluation

Section 15.1 of the Radiation Safety Manual was updated to state that the RSO or designee will determine who meets the criteria to be issued a dosimeter based on expected conditions and dose history for the authorized user operations.

Documents reviewed:

- Section 15.1 RSM on web

Status: Complete

3.10. Dosimetry Reporting Level

ISU contacted Landauer and changed the minimum dose reporting level to 10 mrem to ensure only meaningful doses are tracked.

Documents reviewed:

- Redacted version of a dosimetry report

Status: Complete

3.11. Distribution of Reg. Guide 8.13.

ISU modified form RPR-1, the Radiation Worker Information Form, to provide a link to Reg. Guide 8.13 on the NRC web site. This form is sent electronically to new radiation workers so they will have access to the information in Reg. Guide 8.13.

Documents reviewed:

- Form RPR-1.

Status: Complete

3.12. Quarterly Review of Dosimetry

Dosimetry results are reviewed each quarter by a Radiation Safety Department staff member and reported to the Radiation Safety Committee for evaluation.

Documents reviewed:

- Examples of dose summary for 2020 RSC meetings.

Status: Complete (routine)

3.13. Dosimetry Storage

ISU moved dosimeter storage out of a desk drawer in a steel desk and into plastic storage containers on top of a desk and away from concrete block walls. This ensures the control dosimeters receive a background dose similar to dosimeters stored at authorized user locations and will not bias dosimetry results high.

Documents reviewed:

- Photo of dosimetry storage area.

Status: Complete

3.14. Radioactive Waste Procedures

ISU developed procedure RS-09 Rev. 0 and issued it with an effective date of August 1, 2020. The Radiations Safety Department will assess laboratories to the requirements of this procedure in future inspections.

Documents reviewed:

- RS-09, Rev. 0 on Web.

Status: Complete

3.15. Fume Hood Checks

The Radiation Safety Department maintains a list of fume hoods used for radiological work. Fume hood verification status is assessed monthly and included in the Radiation Safety Department master schedule. In addition, fume hood calibration dates are verified during routing laboratory inspections.

Documents reviewed:

- Monthly schedule. See 1.7.
- List of rad hoods.
- Inspection form RPR 50A (on web). See 2.10

Status: Complete (routine)

3.16. Residual Contamination List

ISU created a list for potential residual radioactive material remaining after individual laboratories are decommissioned.

Documents reviewed:

- Spreadsheet. See 2.5

Status: Complete (routine)

3.17. Reactor Access List

ISU reviewed the access list for personnel with unescorted access to the reactor and removed all personnel who did not need access. Badge swipe readers have been installed and are expected to be fully operational in August 2020. Personnel on the access list will have access through the badge swipe readers and can be removed in the database when access is no longer necessary. Key control will no longer be an issue. ISU will review the access list at the end of each academic year to remove students who have graduated and left the program.

- Former people removed. Badge swipe access in progress

Status: In progress.

3.18. T&R Procedure

ISU prepared a written procedure and checklist for T&R determinations.

Documents reviewed:

- T&R Procedure and Checklist

Status: Complete

Expected Completion Dates from Corrective Action Plan

Action	Expected Completion Date	Status
Hiring		
Hire Radiation Safety Specialist for Pocatello	April 2020	Complete
Radiation safety/industrial hygiene specialist for CAES	September 30, 2020	In progress
Two half-time safety interns for CAES.	May 31, 2020	Complete
Update Procedures		
Dosimetry Procedure	June 2020	Complete
Leak Test Procedure	December 2020	Planned
NMMSS Report	December 2020	Planned
RSC Meeting Minutes	December 2020	Planned
Laboratory Safety and Surveys	September 2020	In progress
Laboratory Inspections	June 2020	Complete
Radioactive Waste Management	June 2020	Complete
NESHAPs	December 2020	Planned
Internal Dosimetry	September 2020	In progress
Operation of Shepherd Sources	December 2020	Planned
Radiation Use Application	December 2020	Planned
Qualification of Radiation Safety Staff	June 2020 Procedure	Complete
Corrections from Independent Assessment		
Update On-line training and refresher training	December 2020	In progress
Update list of laboratory decommissioning on a two year basis	June 2020	Complete
Contaminated equipment forms CAES	March 2020	Complete
RSO Verify survey frequency against permit requirements	Start March 2020	Complete
Create better storage area for dosimeters	June 2020	Complete
Create written procedure to approve or deny T&R status	May 31, 2020	Complete