

February 7, 2014

EA-14-016

Mr. Gary J. Laughlin,
Chief Nuclear Officer
and Head of Operations
Louisiana Energy Services, LLC
P.O. Box 1789
Eunice, NM 88231

SUBJECT: LOUISIANA ENERGY SERVICES, URENCO USA – U.S. NUCLEAR
REGULATORY COMMISSION INSPECTION REPORT NUMBER 70-3103/2013-
202

Dear Mr. Laughlin:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine, announced nuclear criticality safety (NCS) inspection of your facility in Eunice, New Mexico, from November 18-21, 2013. The purpose of the inspection was to determine whether operations involving special nuclear material were conducted safely and in accordance with regulatory requirements. Inspection observations and findings were discussed with members of your staff and management throughout the inspection. An exit meeting was conducted at the conclusion of the inspection on November 21, 2013; re-exit meetings were conducted by telephone on December 19, 2013, and in person at NRC Headquarters on January 15, 2014.

The inspection, which is described in the enclosure, focused on the most hazardous activities and plant conditions; the most important controls relied on for safety and their analytical basis; and the principal management measures for ensuring controls are available and reliable to perform their functions relied on for safety. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant NCS-related equipment, interviews with NCS engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to NCS controls.

Based on the results of this inspection, two apparent violations were identified and are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The first apparent violation being considered is the failure of the management measures to ensure that items relied on for safety (IROFS) were implemented such that they were available and reliable. The second apparent violation being considered involved the failure to report the loss of all IROFS preventing a criticality. Since the NRC has not made a final determination in this matter, no Notice of Violation is not being issued for these inspection findings at this time. No response regarding these apparent violations is required at this time.

In addition, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of 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 Agencywide Documents Access and Management System (ADAMS), ADAMS is accessible from the NRC 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.

If you have any questions concerning this report, please contact Timothy Sippel of my staff at (301) 287-9151, or via email to Timothy.Sippel@nrc.gov.

Sincerely,

/RA/

Michael X. Franovich, Chief
Programmatic Oversight
and Regional Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No. 70-3103
License No. SNM-2010

Enclosures:
NRC Inspection Report No. 70-3103/2013-202
w/Attachment: Supplementary Information

cc w/encl: (See page 3)

G. Laughlin

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G. Laughlin

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cc w/enclosure:

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**U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS**

Docket No.: 70-3103

License No.: SNM-2010

Report No.: 70-3103/2013-202

Licensee: URENCO USA

Location: Eunice, New Mexico

Inspection Dates: November 18– 21, 2013

Inspector: Jeremy Munson, Criticality Safety Inspector (Trainee)
Timothy Sippel, Criticality Safety Inspector

Approved By: Michael X. Franovich, Chief
Programmatic Oversight
and Regional Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure

EXECUTIVE SUMMARY

URENCO USA, National Enrichment Facility NRC Inspection Report 70-3103/2013-202

Introduction

The staff performed a routine, scheduled criticality safety inspection at the URENCO USA (UUSA) facility in Eunice, New Mexico, November 18 – 21, 2013. Staff reviewed the licensee's nuclear criticality safety (NCS) program, administrative and operating procedures, NCS-related internal events, NCS audits and inspections, NCS training, the criticality accident alarm system (CAAS), and plant operations.

Results

- No safety concerns were identified regarding the licensee's NCS program.
- No safety concerns were identified regarding NCS training.
- No safety concerns were identified regarding NCS audits.
- No safety concerns were identified during a review of the licensee's CAAS
- No safety concerns were identified during walkdowns of plant operations.
- The inspectors identified the following two safety concerns during review of the NCS event review and follow-up:
 - Inadequate implementation of items relied on for safety (IROFS) in the small component decontamination train (SCDT). (AV 70-3103/2013-202-01)
 - A failure to report the loss of all IROFS preventing a criticality. (AV 70-3103/2013-202-02)

REPORT DETAILS

1.0 Plant Status

During this inspection UUSA was conducting routine operations to enrich uranium in its gaseous centrifuge facility near Eunice, New Mexico. Large scale construction activities were also underway at the site.

2.0 Nuclear Criticality Safety Program (IP 88015 & 88016)

a. Inspection Scope

The inspectors reviewed elements of the licensee's NCS program and analyses. The inspectors evaluated the adequacy of the program and analyses to assure the safety of fissile material operations. The inspectors reviewed selected NCS analyses to determine that criticality safety of risk-significant operations was assured through engineered and administrative controls with adequate safety margin. The inspectors interviewed licensee criticality engineers, operators, and managers regarding operations, equipment, and controls. The inspectors reviewed selected NCS-related IROFS to determine that the performance requirements have been met for selected accident sequences. The inspectors accompanied nuclear criticality safety (NCS) and other technical staff on walkdowns of NCS controls in selected plant areas. The inspectors reviewed selected portions of the documents listed in Section 2.2 of the Attachment.

b. Observations and Findings

The inspectors determined that evaluations were independently reviewed by qualified NCS engineers and that subcriticality of the systems and operations was generally assured through appropriate limits on controlled parameters. NCS controls for equipment and processes ensured the safety of the operations with the licensee relying primarily on safe by design components for criticality prevention.

The inspectors identified issues with the identification and control of NCS hazards, as well as issues with the licensee's reportability determinations as discussed below in Section 5.0.

c. Conclusion

No safety concerns were identified regarding the NCS program.

3.0 Nuclear Criticality Safety Audits and Inspections (IP 88015)

a. Inspection Scope

The inspectors reviewed licensee internally completed audits of fissile material operations, records of previously completed walkdowns, and records of NCS infractions. The inspectors accompanied a licensee NCS engineer on a routine weekly walkdown of

the SCDT, the pre-operational multi-function decontamination train (MFDT), the liquid effluent collection and transfer system (LECTS), and the 30B cylinder storage area. Additionally, inspectors accompanied a licensee NCS engineer on a plant tour of the ventilated room, gaseous effluent ventilation system, cold traps, chemical and mass spectrometry laboratory, and tails stations. The inspectors reviewed selected portions of the documents listed in Section 2.3 of the Attachment.

b. Observations and Findings

The inspectors observed that NCS audits and walkdowns were conducted in accordance with written procedures. The inspectors noted that NCS audits were focused on determining that plant operations requirements conform to those listed in the applicable NCS specification documents. The inspectors confirmed that deficiencies identified during the audit were appropriately captured in the licensee's corrective action program and resolved in a timely manner.

c. Conclusions

No safety concerns were identified regarding licensee NCS audits and inspections.

4.0 Nuclear Criticality Safety Training and Qualification (IP 88015)

a. Inspection Scope

The inspectors reviewed the content of NCS training for general workers and fissile material handlers to determine if they met specified qualification requirements. The inspectors evaluated the effectiveness of the licensee NCS training through interviews. The inspectors reviewed selected portions of the documents listed in Section 2.4 of the Attachment.

b. Observations and Findings

The inspector's review specifically focused on general employee training and NCS oversight of operator training. The inspectors reviewed the NCS training procedures and content of training for general workers and fissile material handlers. The inspectors reviewed the general NCS training course that operators complete, which also has an annual refresher.

The inspectors also interviewed licensee training personnel concerning the NCS related classroom and on-the-job training and qualifications for operators. The licensee's training organization helps make and maintains training material for specific IROFS and processes and the qualification plans for various positions. These training materials and qualification plans are developed based on consultation between the training function and operations. The training organization also maintains records of training and qualification plans that have been completed and when they will expire.

c. Conclusions

No safety concerns were identified regarding licensee NCS training for operators.

5.0 Nuclear Criticality Safety Event Review and Follow-up (IP 88015 & 88016)

a. Inspection Scope

The inspectors reviewed the licensee response to a selection of recent internally-reported events that impacted NCS. The inspectors reviewed the progress of investigations and interviewed licensee staff regarding immediate and long-term corrective actions. The inspectors reviewed selected portions of the documents listed in Section 2.5 of the Attachment.

b. Observations and Findings

The inspectors reviewed selected licensee internally reported events. There were no events that the licensee considered reportable to the NRC. The inspectors observed that internal events were investigated in accordance with written procedures, appropriate corrective actions were assigned and tracked, and that the licensee adequately evaluated whether or not these events were reportable to the NRC, with exception of the events discussed below.

Inadequate Implementation of IROFS in the SCDT

Introduction: The licensee identified an issue with the implementation of the administrative mass control IROFSs in the SCDT during a routine NCS audit of the area. The inspectors determined that the IROFS were lost because the method in which the licensee implemented the mass controls actually failed to adequately track the mass of uranium. Title 10 of the *Code of Federal Regulations* (10 CFR) 70.62(d) requires, in part, that management measures shall ensure that IROFS are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function. Contrary to this requirement, the licensee failed to ensure that IROFS were available and reliable to perform their function. Although, other non-IROFS controls prevented a significant accumulation of mass.

Description: In Event Report (ER) 2013-1877 the licensee documented an issue they identified with the IROFS applied to the SCDT during a routine NCS audit of the area. The issue was related to the decontamination of 1-S bottles in the SCDT. Two administrative mass controls, IROFS54a and IROFS54b, are the only IROFS credited with limiting the mass of uranium in the SCDT enclosure. The recycling technicians verify that the mass limit is not exceeded by performing two separate, independent measurements prior to placing components in the SCDT. When implementing IROFS54a for the 1-S bottles, a recycling technician would first weigh a bottle and log the weight as the gross weight on the mass log for IROFS54a. This measurement was to represent the sum of the tare weight (the mass of the empty bottle) and the mass of any uranium contents. In order to obtain the mass of the uranium in the 1-S bottles (net weight), the recycling technician would then subtract the tare weight provided by

Operations from this gross weight. However, Operations was providing an incorrect tare weight to the recycling technicians. Instead of the actual tare weight (i.e., the mass of the empty bottle), Operations had been providing the results of the previous measurement taken when the bottle was removed from the cascade, which represented the sum of the true tare weight and the mass of any uranium contents. Consequently, when the recycling technician subtracted the incorrect tare weight from the gross weight, the mass of any uranium contents was effectively cancelled from the calculation. This process was then repeated for all the other bottles in the campaign and the total net mass was then summed. The IROFS54b was implemented in the same way according to the same procedure by another recycling technician using a different scale and a different mass log at a different time. The mass log with the larger of the two sums would be used as the official value in the master mass log.

The IROFS require the recycling technicians to flush out the enclosure when the summed net mass exceeded the mass limit or is suspected to have exceeded the limit (NEF-BD-54a “Administratively Limit the Calculated SCDT Uranic Mass Inventory”). This is how the IROFS prevented accumulations of uranium. Although not part of the IROFS, a recycling technician stated that they had been flushing the enclosure at the end of each campaign.

The licensee’s immediate corrective actions upon discovery were to stop work and document the issue in their corrective action program. The licensee then determined that no immediate safety concern existed by verifying that a minimum critical mass was not present. By recalculating the mass logs with the correct tare weights they determined that no significant uranium accumulation had occurred and the mass limit had not been exceeded. As a corrective action to prevent this issue from reoccurring, recycling technicians were provided access to the database where the tare weights are recorded. This also reduces dependence on Operations to provide tare weights. The inspectors verified that the recycling technicians were now able to retrieve the tare weights by observing a recycling technician access the database and retrieve the tare weight of a selected bottle.

Analysis: Title 10 of the *Code of Federal Regulations* 70.4 defines IROFS as “structures, systems, equipment, components, and *activities of personnel* that are relied on to prevent potential accidents at a facility that could exceed the performance requirements in § 70.61 or to mitigate their potential consequences.” Thus, it is the activities of personnel that are the IROFS, while the procedure(s) that dictate(s) such activities are management measures that need to be applied to the activities of personnel. Given that both IROFS54a and IROFS54b were consistently implemented in a way that resulted in the elimination of uranium mass from calculations and that the purpose of these IROFS is to track and control mass, the IROFSs were ineffective in performing their function and thus lost.

The failure to implement and maintain IROFS needed to meet 10 CFR 70.61(b) is a violation of NRC regulations. This issue is more than minor because even though no significant accumulation occurred, the method in which the IROFS were being implemented was eliminating the uranium mass from the calculation; thus, the IROFS were not available and reliable to perform their function. The IROFS that were lost

(IROFS54a and IROFS54b) were the only IROFS the licensee credited with preventing a criticality in the SCDT.

Enforcement: Paragraph 70.62(d) of 10 CFR states, in part, that “management measures shall ensure that engineered and administrative controls and control systems that are identified as items relied on for safety pursuant to § 70.61(e) of this subpart are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements....” Contrary to this requirement, prior to September 10, 2013, the licensee’s management measures failed to ensure that IROFS54a and IROFS54b were implemented such that they were available and reliable to perform their function. Specifically, they were implemented such that the recycling technicians were subtracting the results of the previous measurement from the gross weight, which effectively cancelled the mass of any uranium contents from the calculation. Given that both IROFS54a and IROFS54b were consistently implemented in this way and that the intended function of these IROFS are to track and control mass, the licensee failed to ensure the IROFSs were available and reliable to perform their function.

The failure of the licensee’s management measures to ensure that IROFS54a and IROFS54b were implemented such that they are available and reliable is an Apparent Violation (AV) of NRC requirements and will be tracked as **AV 70-3103/2013-202-01**, Inadequate Implementation of IROFS in the SCDT.

Failure to Report the Loss of All IROFS Preventing a Criticality

Introduction: After the discovery of the issue with the SCDT IROFS, as discussed above, the licensee incorrectly determined that the IROFS were available and reliable. 10 CFR Part 70 Appendix A (a)(4) requires, in part, that the licensee is to report within one hour whenever no IROFS remain available and reliable to perform their function. Contrary to this requirement, the licensee failed to report the loss of all IROFS (IROFS54a and 54b) preventing a criticality in the SCDT.

Description: These events are described above. In ER 2013-1877 the licensee did not consider these IROFS to have been lost, instead they concluded, “[t]he IROFS and its intent are still sound as written in the ISAS [ISA summary]. The tare weight was not performed as intended, HPE [human performance event] and procedural lack of clarity... the IROFS have not and will not be declared as degraded....” As a result, the licensee did not consider this condition to be reportable.

Analysis: The failure to report the discovery of a condition where all the IROFS for a particular accident sequence (i.e., preventing a criticality) are unable to perform their function is a violation of NRC requirements. Section 2.2.1.c of the Enforcement Policy states, “the Agency will normally cite a licensee for a failure to report a condition or event if the licensee knew of the information to be reported and did not recognize that it was required to make a report.”

Enforcement: Part 70 Appendix A (a)(4) requires “[a]n event or condition such that no items relied on for safety, as documented in the Integrated Safety Analysis summary, remain available and reliable, in an accident sequence evaluated in the Integrated

Safety Analysis, to perform their function... in the context of the performance requirements in 70.61(b) and 70.61(c), or... [p]revent a nuclear criticality accident (i.e., loss of all controls in a particular sequence)” be reported to the NRC Operations Center within one hour of discovery (emphasis mine). Contrary to the above, on September 10, 2013, the licensee failed to report the loss of IROFS54a and IROFS54b that resulted in a condition such that no IROFS, as documented in the Integrated Safety Analysis (ISA) summary, remained available and reliable, in an accident sequence evaluated in the Integrated Safety Analysis, to perform their function. This is an AV and will be tracked as **AV 70-3103/2013-202-02**, Failure to Report the Loss of All IROFS Preventing a Criticality.

Unanalyzed Operation

During review of a Maintenance Work Order (MWO) to refurbish A1 sample bottles, the licensee ISA/NCS reviewer identified that this operation was being performed without the completion of applicable ISA and NCS analysis. Two prior MWOs had been approved and performed previously.

The maintenance operation had been taking place in a Plexiglas box on a cart. This cart and its box had been used for processing 1-S bottles and was intended to limit the spread of contamination. None of the existing hazard and operability studies or NCS analyses covered the refurbishment of the A1 bottles (i.e., this operation had not been considered when developing what could happen at the facility to cause an accident) including the prior analysis for the 1-S bottles. The licensee, through an NCS evaluation of these activities performed immediately after discovery, was unable to conclude that an inadvertent criticality was not credible; therefore, IROFS would be required to prevent a nuclear criticality. The evaluation also included a calculation showing that as few as eight bottles could hold a critical mass. The evaluation results section of ER-2013-1997 states, “This evaluation has not been able to conclude at this date that a technical basis can be established to conclusively state that a nuclear criticality in the box is not credible. Based on the technical information available on the A1s, the Plexiglas Box, the processes used for the filling and outgassing of the A1s, and the proposed maintenance activities to service the A1s, it appears IROFS controls would be required to prevent a nuclear criticality.” The licensee stated that further such operations will take place in the SCDT enclosure and be covered by the analysis and controls for that operation.

However, the licensee did not identify which IROFS were available and reliable to meet the performance requirements for the operations that had already been conducted. After being questioned by the inspectors, the licensee eventually identified that sole IROFS39c would apply to this sequence. IROFS39c is a ‘sense and flee’ IROFS, that relies on personnels ability and training to stop operations and evacuate when exposed to a plume caused by the exposure of uranium hexafluoride (UF₆) to the atmosphere; such as would occur if a A-1 bottle containing UF₆ was opened. The IROFS39c combined with the initiating event probability of a similar accident sequence DS7-1 from the ISA summary is sufficient to render the sequence highly unlikely.

c. Conclusions

The inspectors identified two apparent violations. The first violation was the Inadequate Implementation of IROFS in the SCDT. The second violation was the failure to report the loss of all IROFS preventing a criticality.

6.0 Criticality Alarm Systems (IP 88017)

a. Inspection Scope

The inspectors reviewed documentation of CAAS detector coverage, interviewed engineering and maintenance staff, and performed facility walkdowns to determine the adequacy of the licensee criticality alarm system. The inspectors reviewed selected portions of the documents listed in Section 2.6 of the Attachment.

b. Observations and Findings

The inspectors visually inspected detector configuration during walkdowns. NCS staff and technicians responsible for CAAS testing were interviewed to determine that testing was conducted appropriately. A number of different types of tests and the test results were discussed, as well as the important characteristics and logic of the system.

The annual CAAS test includes a full test of every horn, light, detectors, cluster logic, and timing of the alarm. During the last test the technicians found two non-functional horns. In both cases the other horn in the pair was still functioning, and the technician stated that they took sound pressure measurements to confirm that the audibility requirements were still being met. Based on this discussion, the inspectors concluded that there was no lapse in annunciator coverage due to the licensee-identified speaker malfunction.

c. Conclusions

No safety concerns were identified during review of the licensees' criticality alarm system.

7.0 Plant Activities (IP 88015)

a. Inspection Scope

The inspectors performed plant walkdowns to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspectors also walked down the preoperational MFDT and the ventilated room. The inspectors interviewed operators, NCS engineers, and process engineers before, during, and after walkdowns. The inspectors reviewed selected portions of applicable documents listed for other sections, such as nuclear criticality safety evaluations listed for Section 2.0, before walkdowns.

b. Observations and Findings

The inspectors performed walkdowns in the control room complex; the ventilated room; Separation Building Modules 1001, 1002, 1003 and 1004; and the Cylinder Receipt and Dispatch Building including LECTS, the SCDT, and the MFDT.

c. Conclusions

No safety concerns were identified regarding plant operations.

8.0 Exit Meeting

The inspectors communicated observations and findings to the licensee's management and staff throughout the week of the inspection and presented the final results to the licensee's senior management during an exit meeting held on November 21, 2013, as well as re-exits on December 19, 2013, and January 15, 2014. The licensee's management acknowledged the presented results and findings of the inspection.

SUPPLEMENTARY INFORMATION

1.0 List of Items Opened, Closed, and Discussed

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
AV 70-3103/2013-202-01	Opened	Inadequate Implementation of IROFS in the SCDT
AV 70-3103/2013-202-02	Opened	Failure to report the loss of all IROFS preventing a criticality

2.0 Key Documents Reviewed:

Inspectors reviewed selected aspects of the following documents. Documents that apply to multiple sections are listed in the section that is most applicable.

2.1 **Plant Status**

Not Applicable

2.2 **Nuclear Criticality Safety Program (IP 88015 & 88016)**

- CR-2-1000-01, "Nuclear Criticality Safety Program Description Rev. 7," dated October 7, 2013.
- CR-3-1000-03, "NCS Weekly Walkthroughs and Periodic Assessments," Rev. 11, dated November 11, 2013.
- NCS-CSE-006, "NCSE of SBM Condensate Collection," Rev. 4, dated June 10, 2013.
 - Attachment 2: "EG-3-3200-01-F-2, "NCSE Peer Review and Instructions," dated June 10, 2013.
- NCS-CSE-028, "NCSE of the Small Component Decontamination Train Rev. 5," dated June 21, 2013.
- NCS-CSE-036, "Nuclear Criticality Safety Evaluation of 30B Cylinders on UBC [Uranium Byproduct Cylinder] Pad," Rev. 0, dated October 16, 2013.
- Various nuclear safety releases

2.3 **Nuclear Criticality Safety Inspections, Audits, and Investigations (IP 88015)**

- NCSI-13-0011, dated April 13, 2013.
- NCSI-13-0020, dated June 7, 2013.
- NCSI-13-0023, dated July 2, 2013.
- NCSI-13-0024, dated July 13, 2013.
- NCSI-13-0025, dated July 19, 2013.
- NCSI-13-0026, dated July 26, 2013.
- NCSI-13-0027, dated August 1, 2013.
- NCSI-13-0028, dated August 7, 2013.
- NCSI-13-0029, dated August 15, 2013.

- NCSI-13-0030, dated August 19, 2013.
- NCSI-13-0031, dated August 30, 2013.
- NCSI-13-0032, dated November 6, 2013.
- NCSI-13-0033, dated November 10, 2013.
- NCSI-13-0034, dated November 18, 2013.
- NCSI-13-0035, dated November 23, 2013.
- NCSI-13-0036, dated October 4, 2013.
- NCSI-13-0037, dated October 11, 2013.
- NCSI-13-0038, dated October 21, 2013.
- NCSI-13-0039, dated September 1, 2013.
- NCSI-13-0040, dated September 8, 2013.

2.4 Nuclear Criticality Safety Training and Qualification (IP 88015)

- General Employee Training (GET), "GET Handout," Rev. 6g, dated August 30, 2013.
- LOIROFS4501 "IROFS 45 Surveillance," Rev. 01, dated October 9, 2012.
- TQ-3-0700-02, "Nuclear Safety Worker Training," Rev. 2, dated June 27, 2012.
- TQ-3-0710-01, "Nuclear Criticality Safety Training," Rev. 1, dated July 2, 2009.

2.5 Nuclear Criticality Safety Event Review and Follow-up (IP 88015 & 88016)

- CA-3-1000-01-F-1, "Apparent Cause Evaluation."
- CA-3-1000-02-F-2, "Performance Improvement Program."
- CA-3-1000-02-F-3, "ACE Report Review Form."
- CR-3-1000-04-F-1, "Response to NCS Anomalous Condition or Criticality Accident."
- ER-2013-698, dated April 9, 2013.
- ER-2013-771, dated April 18, 2013.
- ER-2013-866, dated May 2, 2013.
- ER-2013-868, dated May 3, 2013.
- ER-2013-899, dated May 8, 2013.
- ER-2013-1254, dated June 4, 2013.
- ER-2013-1605, dated July 30, 2013.
- ER-2013-1629, dated August 1, 2013.
- ER-2013-1850, dated September 2, 2013.
- ER-2013-1877, dated September 10, 2013.
- ER-2013-1878, dated September 10, 2013.
- ER-2013-1879, dated September 10, 2013.
- ER-2013-1968, dated September 27, 2013.
- ER-2013-1997, dated October 2, 2013.
- ER-2013-2121, dated October 23, 2013.
- ER-2013-2133, dated October 25, 2013.

- ER-2013-2292, dated November 20, 2013.*
- ER-2013-2293, dated November 20, 2013.*
- ER-2013-2294, dated November 20, 2013.*
- ER-2013-2295, dated November 20, 2013.*
- ER-2013-2296, dated November 20, 2013.*
- LL-UUSA-RW-2013-001-002, "Recycling Department Lesson Learned."
- LO-3-2000-12-F-2, "IROFS45 Checklist," Rev. 5.
- LO-3-2000-12, "Crane Inspection and Operation," Rev. 7.
- Maintenance Work Order 1000109444.
- Maintenance Work Order 1000065612.
- Maintenance Work Order 1000123057.
- NEF-BD-54a "Administratively Limit the Calculated SCDT Uranic Mass Inventory," Rev. 0.
- NEF-BD-54b "Administratively Limit the Calculated SCDT Uranic Mass Inventory," Rev. 0.
- OP-3-0490-05 "Outgassing Sample Containers to Product Cold Trap," Rev. 10, dated May 1, 2013.
- RW-3-2000-05, "Uranium Waste Mass Bookkeeping," Rev. 1, Dated August 16, 2013.
- RW-3-2000-05-F-2, "Master SCDT Bookkeeping Log," Rev. 1.
- RW-3-2000-05-F-3, "IROFS54a for SCDT Uranium Waste Mass Determination," Rev. 1.
- RW-3-2000-05-F-4, "IROFS54b for SCDT Uranium Waste Mass Determination," Rev. 1.
- WC-4-1000-04-F-4, "Work Instructions."

* ER written as a result of the inspection.

2.6 Criticality Alarm Systems (IP 88017)

- "Emergency Action Plan for SBM-1001/1002," Rev. 0, dated December 5, 2012.
- "Emergency Action Plan for the Technical Services Building (TSB)," Rev. 0, dated December 5, 2012.
- "Emergency Action Plan for the Cylinder Receipt and Dispatch Building (CRBD)," Rev. 0, dated December 5, 2012.

2.7 Plant Activities

Documents listed in other sections were reviewed related to facility walkdowns.

2.8 Exit Meeting

Not Applicable

3.0 Inspection Procedures Used

IP 88015 Nuclear Criticality Safety Program
IP 88016 Nuclear Criticality Safety Evaluations and Analyses
IP 88017 Criticality Alarm Systems

4.0 Key Points of Contact

LES

W. Padgett* ^{\$}	ISA/NCS Supervisor
A. Riedy*	ISA/NCS Engineer
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T. Knowles* ^{\$} ^{&}	Licensing Manager
C. Slama* ^{\$}	Licensing Engineer
B. Graham* ^{\$}	Licensing Engineer
W. Brunkow*	Recycling Manager
S. Cowne* ^{&}	Head of Compliance
R. Kohrt* ^{\$}	Plant Engineering Supervisor
R. Williams* ^{\$}	Head of Technical Services
M. Conley ^{\$}	Executive Assistant
P. Robinson ^{\$} ^{&}	General Counsel
J. Laughlin ^{&}	Head of Operations, and Chief Nuclear Officer

NRC

J. Munson* ^{\$} ^{&}	Criticality Safety Inspector (Trainee), NRC HQ
T. Sippel* ^{\$} ^{&}	Criticality Safety Inspector, NRC HQ
M. Toth*	Fuel Facility Inspector, NRC RII
K. Kirchbaum*	Fuel Facility Inspector (Trainee), NRC RII
A. Gody*	Director, Division of Fuel Facility Inspections, NRC RII
M. Franovich ^{\$} ^{&}	Chief, Programmatic Oversight and Regional Support Branch, NRC HQ
S. Mendez ^{\$} ^{&}	Fuel Facility Inspector, NRC RII
C. Reed ^{\$}	Fuel Facility Inspector (trainee), NRC RII
L. Pitts ^{&}	Senior Fuel Facility Inspector, NRC RII
M. Raddatz ^{&}	Senior Project Manager, NRC HQ

* Attended the exit meeting on November 21, 2013.

^{\$} Attended the re-exit meeting on December 19, 2013.

[&] Attended the re-exit meeting on January 15, 2014.

5.0 List of Acronyms and Abbreviations

ADAMS	Agencywide Documents Access and Management System
AV	apparent violation
CAAS	criticality accident alarm system
CFR	Code of Federal Regulations
CRDB	Cylinder Receipt and Dispatch Building
ER	Event Report
HPE	human performance error
IROFS	items relied on for safety
ISA	integrated safety analysis
ISAS	integrated safety analysis summary
LECTS	liquid effluent collection and transfer system
MFDT	multi-function decontamination train
MWO	maintenance work order
NCS	nuclear criticality safety
NCSA	nuclear criticality safety analysis
NCSE	nuclear criticality safety evaluation
NSR	nuclear safety release
SAR	Safety Analysis Report
SBD	Safe-by-Design
SBM	separation building module
SCDT	small component decontamination train
SNM	special nuclear material
TSB	Technical Services Building
UBC	Uranium Byproduct Cylinder
UF ₆	uranium hexafluoride
UUSA	Urenco U.S.A.
VSR	ventilated storage room