UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

September 6, 2000

David C. Frydenland, Vice-President and
General Counsel
International Uranium (USA) Corporation
Independence Plaza, Suite 950
1050 Seventeenth Street
Denver, Colorado 80265

SUBJECT: NRC INSPECTION REPORT 40-8681/00-01 AND NOTICE OF VIOLATION

Dear Mr. Frydenland:

On July 27, 2000, the NRC completed an inspection at your White Mesa Mill near Blanding, Utah. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The preliminary inspection findings were presented to you and members of your staff at the conclusion of the onsite inspection. A telephonic briefing was held with Mr. Hochstein and members of your staff on August 22, 2000, following the completion of additional in-office inspection. The enclosed report presents the results of that inspection.

Based on information developed during the inspection, the NRC has determined violations of NRC requirements occurred. Three violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the enclosed inspection report. The first violation involved the failure to follow established standard operating procedures (SOPs) for performing functional checks of radiation detection instruments in accordance with License Condition 9.6. The second violation involved a failure to implement the Performance-Based License condition, a violation of License Condition 9.4. Specifically, your staff changed a radiation survey procedure that is described in the license application, but failed to maintain records required by the license, of the basis for determining the change was in compliance with the requirements referred to in the license. The third violation was for failure to perform unrestricted release surveys of certain vanadium product drums prior to shipment as specified by your license. Additionally, the inspection found that some vanadium product drums exhibited elevated levels of radioactivity. This finding is the subject of an Unresolved Item in this report. An Unresolved Item is a matter about which the NRC needs additional information in order to ascertain whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation. The issues which appear to be unresolved center on jurisdiction of the NRC over the radioactivity in your vanadium product and any safety controls which may be needed for this material. With respect to these issues, we are in receipt of your letter dated August 25, 2000, which describes your position on the subject. Until these matters are resolved, we understand that you committed to make no shipments of contaminated vanadium product currently in storage. If your understanding of this commitment is different than stated above, please contact us immediately.

A fourth violation concerning the release of contaminated intermodal containers is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A(8) of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or the significance of this NCV, you should provide a response with 30 days of the date of this inspection report, with the basis of your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. For your consideration and convenience, NRC Information Notice 96-28, “SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPLEMENTATION OF CORRECTIVE ACTION,” is enclosed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Louis C. Carson II at (817) 860-8220 or Dr. D. Blair Spitzberg at (817) 860-8191.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 40-8681
License No.: SUA-1358

Enclosures:
1. Notice of Violation
2. NRC Inspection Report 40-8681/00-01

cc w/enclosures:
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bcc w/enclosures to DCD (IE07)

bcc w/enclosures (via ADAMS distrib):
EWMerschoff
PTing, NMSS/FCSS/FCLB (T 8 E13)
DMGillen, NMSS/FCSS/URS (T 7 J8)
RWVonTill, NMSS/FCSS/URS (T 7 J8)
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ENCLOSURE 1

NOTICE OF VIOLATION

International Uranium (USA) Corporation
San Juan County, Utah

Docket No.: 40-8681
License No.: SUA-1358

During an NRC inspection conducted on July 24-27, 2000, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violations are listed below:

A. License Condition 9.6 states, in part, that standard operating procedures (SOPs) shall be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. Additionally, written procedures shall be established for non-operational activities to include instrument calibrations.

Section 3.1.2.3.2 of the licensee's procedure "Checks" required that instrument checks are made for each detector using an appropriate calibrated source. Comparison of the results with those obtained at the calibration is utilized to determine field performance. If deviations exceeding 10 percent are noted, recalibration of the detector is required.

Contrary to the above, alpha detector functional check results for June and July 2000, were not compared to the results of the instruments' calibration to determine the field performance of the alpha detectors.

This is a Severity Level IV violation (Supplement VI).

B. License Condition 9.4(A&B) states, in part, that the licensee may, subject to the conditions specified in this condition, make changes in procedures presented in the application. The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations, made by the safety, environmental, and review panel (SERP) that provide the basis for determining if changes are in compliance with the requirements referred to in Part B of this condition.

The January 1991 License Application, Section 2.7, "Product Shipment Surveys," states, in part, that product shipment from the facility will be monitored by the radiation protection department prior to shipment release. Product shipment includes uranium and vanadium. Section 2.7 of the license application requires that all barrels are fixed alpha and gamma scanned; inspected for leaks, holes, and cleanliness; and the inspection is documented.

In December 1998, the licensee determined that the procedure in License Application Section 2.7 "Product Shipment Surveys," did not apply to vanadium product shipments and therefore, the licensee stopped performing fixed alpha and gamma scan surveys and inspections on all vanadium product barrels as specified in Section 2.7 of the license

application. Contrary to the above, records were not maintained of this change with a written safety and environmental evaluation that provided the basis for determining that the change was in compliance with the requirements referred to in License Condition 9.4(B).

This is a Severity Level IV violation (Supplement VI).

C. License Condition 9.10 requires those releases of equipment or packages from the restricted area shall be in accordance with "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated May 1987, or suitable alternative procedures approved by the NRC prior to any such release.

Section 2.7.5.(3) and (4) of the SOP "Procedures - Uranium & Vanadium Concentration Shipments" required, in part, the licensee to perform removable alpha contamination (smear/swipe) survey on any barrel that exceeds 1,000 disintegrations per minute per 100 square centimeters (dpm/100cm^2) fixed alpha contamination.

Contrary to the above, on March 17 and April 14, 2000, three barrels containing vanadium product were released from the site restricted area with measured fixed contamination that exceeded 1,000 dpm/100cm^2. The licensee measurements however were not capable of determining the fraction of this radioactivity that was alpha contamination. Therefore, the licensee did not perform surveys for removable alpha contamination as required. Specifically, the three barrels had fixed contamination levels of 1,200, 1,600, and 2,000 dpm/100cm^2, respectively.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201, International Uranium (USA) Corporation, is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 6th day of September 2000

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.	40-8681
License No.	SUA-1358
Report No.	40-8681/00-01
Licensee:	International Uranium (USA) Corp.
Facility:	White Mesa Mill
Location:	San Juan County, Utah
Dates:	July 24-27, 2000
Inspector(s):	Louis C. Carson II, Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
	Judith L. Walker, Inspector-In-Training Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
Accompanied by:	R. William VonTill, Geotechnical Engineer Uranium Recovery Section Fuel Cycle Safety and Safeguards
	Phillip Ting, Branch Chief Fuel Cycle Licensing Branch Fuel Cycle Safety and Safeguards
Approved by:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
Attachment:	Supplementary Information

EXECUTIVE SUMMARY

White Mesa Mill
NRC Inspection Report 40-8681/99-01

This inspection included a review of site status, management organization and controls, site operations, radioactive waste management, radiation protection and environmental protection programs.

Management Organization and Controls

- The licensee had maintained an organization structure that agreed with the requirements of the license (Section 2.0).

- With one exception that is discussed in Section 3.2(f) of this report, the licensee had adequately implemented the performance-based conditions of the license (Section 2.0).

- The licensee's review and use of site procedures were adequate with two exceptions that are discussed in Sections 3.2 (c) and (f) of this report (Section 2.0).

Radiation Protection

- The radiation protection program areas that were reviewed and found to be acceptable were facility posting and access control, personnel air sample analyses, and as low as reasonably achievable (ALARA) program reviews (Section 3.0).

- Violations were identified in the radiation safety area for failure to follow procedures for compliance with instrument functional checks, radioactive material and contamination controls, and material and equipment free release surveys. Three cited violations and one non-cited violation were identified in these areas. An Unresolved Item was identified concerning the controls for vanadium product (Section 3.0).

Radioactive Waste Management and Environmental Protection

- Operational activities were being conducted safely and in accordance with the conditions of the license as well as NRC regulations (Section 4.0).

- A review of the licensee's onsite control of the alternate feed material demonstrated the licensee was maintaining control of the material in an orderly, controlled fashion (Section 4.0).

- The licensee was noted to be collecting environmental monitoring samples as required by the license and as reported in the 1999 semi-annual effluent reports. All sample results were less than the associated effluent release limits specified in 10 CFR Part 20 during 1999. No adverse trends were identified (Section 4.0).

Followup

- One open item remained open regarding a shipment of soil containing hazardous waste that had to be reclaimed and shipped (Section 5).

Report Details

1 Site Status

The NRC issued Source Material License SUA-1358 to Energy Fuels Nuclear during August 1979. Ownership of the site was eventually transferred to Umetco Minerals, back to Energy Fuels Nuclear, and finally to International Uranium (USA) Corporation (IUC). IUC assumed ownership of the White Mesa Mill on May 10, 1997. The NRC approved the transfer via Amendment 2 of the revised License SUA-1358. This amendment was issued to IUC on May 9, 1997.

The mill was actively receiving alternate feed material during the inspection. Alternate feed material is material other than natural uranium ore. The licensee is authorized to receive and process alternate feed materials from certain out-of-state entities by License Conditions 10.6 through 10.13.

The licensee is also receiving and processing bulk uranium ore from active mines through private contractors. Since the previous inspection, the licensee had processed vanadium from Colorado Plateau Ore and reprocessed old vanadium that had been stored at the site since 1988. The licensee had shipped 30 lots of vanadium product since the last inspection. Additionally, the licensee as authorized by License Condition 10.5 was disposing of 11e.(2) byproduct material waste.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The organization structure was reviewed to ensure the licensee had maintained effective organization and management controls in place to ensure compliance with NRC requirements. Also, the utilization and implementation of the licensee's performance-based license (PBL) was reviewed.

2.2 Observations and Findings

a. Management Organization

The organization structure requirements are provided in License Condition 9.3, which references the NRC-approved license renewal application dated January 30, 1997. The licensee had made no changes to the organization structure since the previous inspection. The licensee's organization structure was found to be in agreement with the intent of License Condition 9.3.

b. Performance-Based License Review

License Condition 9.4 states that the licensee may, under certain conditions and without prior NRC approval, make changes in the facility or processes, make changes to procedures, or conduct tests and experiments not presented in the license application. The licensee's implementation of the performance-based license provisions was reviewed to ensure that any changes made by the licensee did not negatively impact the licensing basis of the site. The NRC granted the licensee a performance-based license during March 1997.

Making changes pursuant to License Condition 9.4 are required to be reviewed by a safety and environmental review panel (SERP). Proposed changes and the deliberations are required to be documented pursuant to License Condition 9.4(D). On July 7, 2000, the licensee submitted its annual SERP report to the NRC pursuant to License Condition 9.4(D). During the licensee's SERP period (July 1, 1999 - June 30, 2000), the licensee held six SERP meetings. The licensee has held three SERP meetings since the previous inspection. The inspectors reviewed the meeting minutes from SERP No. 00/01 and 02 dated July 21 and 24, 2000, and found them to be adequate. However, the licensee held a SERP meeting in December 1999, that resulted in a change to a procedure that is in the license application, and the SERP's decision was not documented in accordance with License Condition 9.4. This matter is further discussed in Section 3.2(f) of this report.

Additionally, License Condition 9.4 states that the licensee's SERP shall function in accordance with the SOP submitted to the NRC on June 10, 1997. The inspector reviewed SOP No. PBL-1, "Safety and Environmental Review Panel," Revision 2, dated June 7, 1997, which implemented the PBL process. The inspectors did not identify any changes in the SOP as approved by the NRC.

Based on review of the 1999 and the July 2000 SERP minutes, the inspectors determined that the SERP met the requirements of License Condition 9.4, with the exception that is discussed in Section 3.2(f) of this report.

c. Site Procedures

In accordance with License Condition 9.6, SOPs are required to be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. The inspectors reviewed the health physics manual, SOPs for plant process operations, and the emergency response plan. The inspectors noted continual improvements in the quality of the licensee's procedures since 1994. The radiation safety officer (RSO) had been updating, reviewing, and approving procedures as required by License Condition 9.4. However, the inspectors identified an example where an established radiation protection SOP was not consistent with the procedure described in the license application. Additionally the inspectors identified an example where radiation protection staff was not following the established procedure. The specific examples of these inconsistencies are further discussed in Sections 3.2 (c) and (f) of this report.

2.3 Conclusions

The licensee had maintained an organization structure that agreed with the requirements of the license. With one exception, the licensee had correctly implemented the performance-based conditions of the license. The licensee's review and use of site procedures were adequate with two exceptions that are discussed in Sections 3.2 (c) and (f) of this report.

3 Radiation Protection (83822)

3.1 Inspection Scope

Portions of the licensee's radiation protection program were reviewed to verify compliance with the conditions of the license as well as the requirements of 10 CFR Part 20.

3.2 Observations and Findings

a. Site Tour

A facility tour was performed to observe activities in progress. Site perimeter postings, required by License Condition 9.9 were in place at the appropriate entrances to the mill. During the inspectors' site tour, radiation levels were measured using an NRC microRoentgen (µR) meter. The background radiation level offsite was 10-15 µR/hr. Surveys taken in various locations throughout the mill and around the ore pad showed the following radiation levels:

- Sag Mill - 200 µR/hr
- Ash Lot No. 133 - 500 µR/hr
- Main Grizzly - 800 µR/hr
- Pulp storage tank area - 200 µR/hr
- Truck Wash/Decon Pad - 700 µR/hr
- Ore pad near fenceline - 300 µR/hr
- Truck checkout Point - 50 µR/hr
- Cell 2, 11e.(2) area - 60 µR/hr

The inspectors' radiation measurements were consistent with the licensee's routine survey results. No "Radiation Areas" as defined by 10CFR20.1003 were identified within the process facility. The inspectors identified that the vanadium storage area had elevated radiation levels of 300-400 µR/hr. It was determined that this area was part of the site restricted area and was adequately posted as required by License Condition 9.9. No health or safety concern was identified during the tour.

b. As low As Reasonably Achievable Program Review

In accordance with License Condition 11.6, an annual as low as reasonably achievable (ALARA) audit of the radiation safety program is required to be performed in accordance with Regulatory Guide 8.31. The most current ALARA audit was conducted in 1999 and was found to have been adequate. Portions of the radiation safety officer's daily, weekly and monthly inspection reports were reviewed. These reports were required by Section 3.6 of the ALARA Program section of the license application. The reports provided

useful information such as in-plant radiological sampling and survey results. No significant health or safety issue was identified.

On June 14 and 16, 2000, the licensee conducted ALARA Meetings. The inspectors reviewed the ALARA committee meeting minutes. The licensee's ALARA meeting covered several topics including the investigation of intermodal container management, vanadium circuit operations, reviewing and establishing SOPs, and assuring compliance with regulatory requirements. The inspector determined that the ALARA meeting minutes were adequate.

c. Instrument Calibrations

(1) Requirements

License Condition 9.6 states, in part, that standard operating procedures shall be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. Additionally, written procedures shall be established for non-operational activities to include instrument calibrations. An up-to-date copy of each written procedure shall be kept in the mill area to which it applies.

All written procedures for both operational and non-operational activities shall be reviewed and approved in writing by the radiation safety officer (RSO) before implementation and whenever a change in the procedure is proposed to ensure that proper radiation protection principles are being applied. The inspectors found that the licensee used several procedures for calibrating and conducting efficiency checks on instruments.

Section 3.0 of the license application from January 1991 addresses the site's required radiation protection procedures for instrument calibrations. Section 3.0 of the license application had been duplicated as the established calibration SOP in the January 1991, Radiation Protection Manual, Section 3, Appendix D. In December 1998, Pages 29-31 of the health physics manual was drafted as the licensee's latest written SOP for calibrating and performing efficiency checks of alpha radiation detection instruments. The inspectors noted that the 1991 procedure identified the specific brands and models of radiation instruments used at the site. The 1998 SOP did not identify specific instrument brands; it was generically written for performing calibrations and efficiency checks on instrument types like alpha meters. The licensee also used the vendor manual to operate the instruments to provide guidance during calibrations and efficiency checks. The RSO explained that they were continuing to revise instrument calibration procedures.

(2) Instrument Functional Checks

Section 3.1.2.3.2 of the licensee's procedure "Checks" required the following:

> "Checks are made for each detector using an appropriate calibrated source. Mounting a source a fixed repeatable distance from the detector, a reading is made. Comparison of the results with those obtained at the calibration is utilized to determine field performance. If deviations exceeding 10 percent are noted, recalibration of the detector is required."

The inspectors reviewed the June and July 2000 alpha instrument efficiency check records. It was determined that the licensee did not compare the results of the instrument efficiency checks to the results of the instrument calibration. Therefore, the licensee had not been conducting alpha detector checks in accordance with the established procedure. This was identified as a violation of License Condition 9.6 for failure to follow established procedures for instrument calibrations (40-8681/0002-01).

Additionally, the inspectors noted that the alpha detectors were calibrated with plutonium-239, but efficiency checked with a thorium-232 check source. The inspector observed the RSO perform a conventional efficiency check on an alpha detector. The inspectors noted that the apparent efficiency of the alpha detector using thorium-232 was 7-8 percent. The inspectors compared the 7-8 percent efficiency to the revised plutonium-239 calibration efficiency of 15-17 percent. The inspectors determined that the different instrument responses to thorium and plutonium illustrated the importance of assuring that the calibration efficiency check source was equivalent to calibration source.

In summary, the licensee had not been conducting alpha instrument functional checks in accordance with the approved SOP, which was a violation of License Condition 9.6.

d. Air Samples Analyses

License Condition 11.4 requires that on an annual basis, the licensee collects, during mill operations, 8 hours of air samples in routinely and frequently occupied areas of the mill. In addition, with each change in mill feed material, the licensee must analyze mill feed or production product for natural uranium, thorium-230, radium-226, and lead-210. The inspectors reviewed air sample results from January 1999 to March 2000. The RSO had collected annual 8-hour air samples for the Ashland-2 alternate feed material and for materials that were in storage that contained both uranium and vanadium. The RSO found that airborne thorium-230 concentrations were significantly higher from the Ashland-2 material than other feedstock such as the Colorado Plateau Ore. The RSO determined that operators who worked with the Ashland-2 material had to be assigned an additional 100 millirem dose for 1999 based on the 8-hour air sample results. The inspectors concluded that the licensee had met the requirements of License Condition 11.4.

e. Contaminated Vanadium

During site tours the inspectors conducted radiation surveys using an NRC calibrated microRoentgen meter. The inspectors noted that the offsite background levels measured 10-15 µR/hr. However, the inspectors found a fenced area of the owner controlled property that measured 300-400 µR/hr at the fence. The inspectors noted that blue 55-gallon drums were stored behind the fenced area. Based on the inspectors' inquiry about the contents of the barrels, the licensee revealed that the drums contained vanadium product that was contaminated with radioactive material. Vanadium is a constituent of some ores (Colorado Plateau Ore) and is present in the uranium recovery process raffinate as a dissolved solid. The licensee's vanadium process involves processing the uranium recovery raffinate through a solvent extraction process in order to precipitate and recover vanadium as a commercial product. This vanadium recovery process was designed to remove all

radioactive material from the vanadium product. The RSO had notified IUC management that the vanadium was radioactively contaminated by a letter dated May 5, 2000. Although not required, the licensee did not inform the NRC of this situation. The inspectors surveyed the barrels containing vanadium and the contact radiation readings measured by the inspector were as follows:

- Lot 45 Drum No. 39 - 210 µR/hr
- Lot 45 Drum No. 22 - 200 µR/hr
- Lot 44 Drum No. 45 - 100 µR/hr
- Lot 49 Drum No. 41 -1,600 µR/hr
- Lot 51 Drum No. 61 - 700 µR/hr
- Lot 51 Drum No. 34 - 700 µR/hr
- Lot 52 Drum No. 9 -1,000 µR/hr
- Lot 52 Drum No. 8 -1,000 µR/hr

The licensee's energy compensated Geiger-Mueller detector measured 1,500 µR/hr on contact at Drum No. 41. The inspectors' review of the licensee's May 5, 2000, letter from the RSO to the IUC president revealed the following:

- Each vanadium lot consisted of 66 barrels.

- Lots 34-52 were ready for shipment when a buyer was found.

- Lots 34-52 had total uranium concentrations between 32-850 picocuries/gram (pCi/g) and total thorium concentrations between 232-1462 pCi/g.

The licensee's course of action regarding the contaminated vanadium product was to blend the higher contaminated lots of vanadium with the lower contaminated lots. This strategy was in order to get the amount of source material in each lot below the 0.05 percent by weight "Unimportant Quantities" limit from 10CFR40.13. According to the licensee, they had not determined a root cause for the vanadium product lots being contaminated. However, they believed the problem was due to a possible failure in the process circuit and that they had reprocessed contaminated vanadium that had been stored since 1988. The inspectors noted however that Section 3.9 of the July 1991 license application "Byproduct Vanadium Recovery," states that the vanadium is not radioactive. In addition, Section 3.2.2.2 of the White Mesa Environmental Statement Report, "Byproduct Vanadium Recovery" states that less than 0.005 percent U_3O_8 will be contained in the vanadium product.

The inspectors noted that radioactive material labels had not been placed on the vanadium barrels that were in the storage area. Additionally, the inspectors noted that Lots 1-33 had been shipped as non-radioactive material. The inspectors noted that the licensee's vanadium shipping records routinely included a non-radiological analyses of the constituents that were in the vanadium product. However, the licensee did not routinely perform radioisotopic analyses on the vanadium product, and they had no requirement to conduct such analyses. The licensee provided vanadium shipment records from the previous shipments that occurred in 1988. The radiation survey records for these releases of the product measured 300-1100 dpm/100cm^2 fixed contamination and 0.1 millirem/hour.

The inspectors determined that this matter would be considered an Unresolved Item (URI) pending further review by the NRC. An Unresolved Item is a matter about which the NRC needs additional information in order to ascertain whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation (40-8681/0001-02). Meanwhile, the IUC president committed that White Mesa would not release and ship the contaminated vanadium product that was in storage until this URI is resolved.

The inspectors also found the licensee had decided that Section 2.7 of license application "Product Shipment Surveys" and SOP 2.7.5, "Procedures - Uranium & Vanadium Concentrates Shipments," were no longer applicable to vanadium product shipments. The inspectors questioned whether this change degraded licensee safety commitments as specified in the license application Section 2.7. License Condition 9.4 allows the licensee, without prior NRC approval, to make changes in procedures presented in the application if there is no degradation in the essential safety or environmental commitments. The licensee's SERP did not document the reason for the change. This aspect is further detailed in Section 3.2.f(2) of this report. However, the licensee's decision to drop vanadium product surveys as a license requirement is considered part of the URI pending resolution of the question of jurisdiction over the contaminated vanadium product.

f. Release Surveys for Equipment and Packages

(1) Release Survey Requirements

License Condition 9.10 requires that releases of equipment or packages from the restricted area shall be in accordance with "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated May 1987, or suitable alternative procedures approved by the NRC prior to any such release.

Section 2.7 of the January 1991 license application "Product Shipment Surveys," states, in part, that product shipments from the facility will be monitored by the radiation protection department prior to shipment release. Section 2.7 of the license application requires that all barrels are fixed alpha and gamma scanned; inspected for leaks, holes, and cleanliness; and the inspection is documented. Additionally, Section 2.7.4 provides detailed procedural steps to be followed when surveying the product drums for release.

(2) Reduction in Product Drum Surveys

In December 1998, the licensee determined that the procedure in License Application Section 2.7 "Product Shipment Surveys," did not apply to vanadium product shipments and therefore, the licensee stopped performing fixed alpha and gamma scan surveys and inspections on all barrels as specified in Section 2.7 of the license application. Additionally, the licensee's SERP did not maintain a record of this change with a written safety and environmental evaluation that provided the basis for determining that the change was in compliance with the requirements referred to in License Condition 9.4(B). The inspectors' review of vanadium shipment records of Lots 1-33 from March-June 2000 confirmed that the licensee was no longer conducting radiological surveys in accordance with the instructions in Section 2.7 of the license application.

Further discussions with the RSO and corporate management revealed that it was decided in either a December 1998 ALARA or SERP meeting that the survey requirements for product shipments did not apply to vanadium product shipments and therefore, these surveys were no longer performed. At the time of this inspection, the licensee could not provide the inspectors with the December 1998 ALARA Committee or SERP minutes.

License Condition 9.4 states, in part, that the licensee may, subject to the conditions specified in this condition make changes in procedures presented in the application. The licensee shall file an application for an amendment to the license, unless the following conditions are satisfied: There is no degradation in the essential safety or environmental commitments in the license application. The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations, made by the safety, environmental, and review panel. These records shall include written safety and environmental evaluations made by the SERP that provide the basis for determining that changes are in compliance with the requirements referred to in Part B of this condition.

In summary, in December 1998 the licensee changed the requirements of Section 2.7 of the license application for conducting radiological surveys on vanadium product shipments. However, the licensee did not maintain records of the safety evaluation made by the SERP for determining that the change was in compliance with the performance-based license. This was a violation of License Condition 9.4 (40-8681/0002-03).

(3) Contaminated Drums of Vanadium Released Offsite

The licensee's equipment and material release limits are found in the White Mesa "Equipment Release/Radiological Survey Procedure," which incorporates the "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use of Termination of Licenses for Byproduct, Source, or Special Nuclear Material," (Guidelines) dated May 1987. Table 1 of the Guidelines "Acceptable Surface Contamination Levels" for natural uranium contamination has a release limit of 5,000 dpm/100cm^2 average fixed contamination and 1000 dpm/100cm^2 removable contamination. The Guidelines specifies release limits for thorium-230 and radium-226 which are 100 dpm/100cm^2 average fixed contamination and 20 dpm/100cm^2 removable contamination. Natural uranium, thorium-230, and radium-226 are part of the White Mesa site's radiological profile. Additionally, the Guidelines states, in part, that the average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 millirad/hour at 1 centimeter for beta radiation and 1.0 millirad/hour at 1 centimeter for gamma radiation.

The inspectors reviewed release survey records of vanadium product that had been released out of the restricted area since March 2000. The inspectors reviewed vanadium shipment records associated with 33 lots. One lot normally consisted of 66 barrels (drums) that weighed on average 550 pounds. The inspectors' review of the other vanadium lots that were shipped revealed that some barrels were released with measured contamination levels of more than 1,000 dpm/100cm^2. However, the RSO stated that the barrels had been washed off before leaving the site in accordance with the SOP. The inspectors examined

the shipping records associated with Lot Nos. 7 and 9 that were shipped on March 17 and April 14, 2000, respectively. Records indicated that barrel Nos. 32 and 44 in Lot No. 7 had measured radiation readings of 0.16 and 0.2 millirem/hour, respectively. Likewise, the licensee's records indicated that Barrels 32 and 44 had total contamination levels of 1,600 and 2,000 dpm/100cm^2. Records indicated that barrel No. 37 in Lot No. 9 had measured radiation reading of 0.12 millirem/hour. Likewise, the licensee's records indicated that Barrel No. 37 had total contamination level of 1,200. Additionally, there were four other barrels that measured fixed contamination at 1,000 dpm/100cm^2.

Sections B(1, 3, and 5) of the SOP "Determination of External Contamination of Product Drums," dated December 1998, required, in part, that product drums must be swiped with filter paper discs to determine if they are externally contaminated. The filter swipe must be counted via standard gross alpha counting techniques. The results of the contamination surveys for each drum must be logged onto the drum contamination report. The inspectors further noted that the drum contamination reports stated that if total alpha contamination is greater than or equal to 1000 dpm/100cm^2, a removable smear is required.

Section 2.7.5.(3) and (4) of the SOP "Procedures - Uranium & Vanadium Concentration Shipments" required, in part, that the licensee to perform removable alpha contamination (smear/swipe) surveys on any barrel that exceeds 1,000 disintegrations per minute per 100 square centimeters (dpm/100cm^2) fixed alpha contamination.

However, on March 17 and April 14, 2000, three barrels containing vanadium product were released from the site restricted area that exceeded 1,000 dpm/100cm^2 fixed contamination, and the licensee did not conduct fixed or removable alpha contamination (smear/swipe) surveys on the barrels. The three barrels surveyed had contamination levels of 1,200, 1,600, and 2,000 dpm/100cm^2. However, the licensee had not determined if the contamination was from alpha radioactivity The inspectors determined that the licensee's failure to conduct required fixed or removable alpha contamination release surveys on the barrels from Lots 7 and 9 was a violation of License Condition 9.10 (40-8681/0002-04).

g. Intermodal Container Releases

During the period from January 2 to April 18, 2000, the licensee had determined that 17 intermodal containers had been released from the White Mesa facility with external radiation contamination in excess of Department of Transportation (DOT) limits. The licensee reported this finding to the NRC on March 1, 2000. The licensee conducted an extensive investigation of the circumstances surrounding the release of the contaminated containers. The licensee had implemented short and long term corrective actions associated with this matter. The inspectors reviewed the following licensee investigation reports and corrective actions concerning the inadvertent intermodal container releases:

- Investigation Report of Intermodal Container Management at the International Uranium Corporation White Mesa Mill, May 26, 2000.
- SERP No. 00/01-02: Meeting Minutes, July 21 and 24, 2000.
- ALARA Committee Meeting Minutes, June 14 and 16, 2000.
- SOP: "Intermodal Container Acceptance, Handling, and Release," July 27, 2000.

The licensee found that out of approximately 6,000 intermodal containers released from the site, 17 were found to have been contaminated with radioactive material from the White Mesa site in excess of the DOT shipping limit of 22,000 dpm/100cm^2. A review the survey data revealed that contaminated containers measured between 2,315-37,791 dpm/100cm^2. The inspectors determined that these contamination levels did not represent a significant safety potential to members of the public because the containers were empty and in transit during most of the time they were in the public domain. The licensee determined that the cause of the inadvertent releases were as follows:

- Failure to adhere to the general SOP for equipment releases and failure to establish an SOP that was specific to intermodal container releases.

- Wet radioactive material from within the site restricted area splattered on the underside of the container and would not be decontaminated.

- The amount of traffic accessing the restricted area had increased the probability of releasing contaminated containers.

The licensee's corrective actions included the following:

- On July 24, 2000, the licensee implemented a new SOP "Intermodal Container Acceptance, Handling, and Release."

- Truck routes on the site were modified. Trucks that transport feed material to White Mesa have limited site access, if any, to the restricted area. Most trucks have access to the owner controlled area where the trailer or intermodal container of material is disconnected and transferred to the licensee's truck. The licensee's staff now unloads the contents of the container at the ore pad.

- The licensee instituted new intermodal trailer/container washing and decontamination procedures.

Inspectors observed the licensee's implementation of the new intermodal container SOP. Licensee personnel were observed satisfactorily conducting contamination surveys on both the intermodal containers and licensee vehicles that were exiting the restricted area.

In a letter dated June 22, 2000, the licensee stated that during a telephone call with the NRC project manager regarding the intermodal container issue, that they concluded that they failed to implement their SOP for releasing intermodal containers for restricted use.

Failure to implement the SOP for releasing intermodal containers for restricted use was a violation of License Conditions 9.6 and 9.10. The inspectors determined that the licensee had satisfactorily implemented corrective actions, and the contamination levels that were detected on the containers had a low safety consequence to members of the public. This matter was considered non-repetitive, licensee-identified and corrected. Therefore, this violation is being treated as a non-cited violation, consistent with Section VI.A(8) of the NRC Enforcement Policy (NCV: 40-8681/0001-05).

3.3 Conclusions

The radiation protection program areas that were reviewed and found to be acceptable were facility posting, personnel air sample analyses, and ALARA program reviews.

Violations were identified in the radiation safety area for failure to follow procedures for instrument calibrations and functional checks, radioactive material and contamination controls, and material and equipment free release surveys. Three cited violations and one non-cited violation were identified in these areas. An Unresolved Item was identified concerning controls for vanadium product.

4 Radioactive Waste Management (88035) and Environmental Monitoring (88045)

4.1 Inspection Scope

The environmental, effluent and groundwater monitoring programs were reviewed to assess the effectiveness of the licensee's programs and to evaluate the effects, if any, of site activities on the local environment.

4.2 Observations and Findings

a. Site Operations

The licensee was not processing alternate feed material or uranium ore during this inspection. Conventional uranium ore operations occurred from April-October 1999. From November-December 1999, the licensee had processed Colorado Plateau Ore that contained both uranium and vanadium, and the licensee also reprocessed vanadium that had been storage since 1989.

In accordance with License Conditions 10.6 and 10.7, IUC is authorized to process alternate feed material from Allied Signal. This material, referred to as "CaF" (calcium fluoride), had been stockpiled for future processing.

In accordance with License Conditions 10.10, 10.11, 10.12, and 10.13, the licensee was receiving bulk alternate feed materials in soil form from the Ashland Formerly Utilized Sites Remedial Action Program near Tonowanda, New York, and drummed calcined byproduct materials from Cameco Corporation's Blind River and Port Hope facilities in Ontario, Canada.

License Condition 10.5 authorizes the licensee to dispose of 11e.(2) byproduct material generated at licensed in-situ leach facilities subject to several conditions, including a 5000 cubic yard limit from a single source.

The inspectors specifically reviewed the licensee's implementation of License Condition Nos 10.5, 10.10, 10.11, 10.12, and 10.13 in the areas of airborne contamination, radiation safety, and vehicle scanning. The inspectors found that the licensee had been receiving and processing the alternate feed material and disposing of the 11e.(2) materials in accordance with the detail of the applicable license amendment request commitments.

b. Environmental and Effluent Monitoring Programs

Environmental monitoring program requirements are identified in License Condition 11.2, which specifies that the licensee implement the effluent and environmental monitoring programs specified in Section 5.5 of the renewal application. During the inspection, the inspectors reviewed the semi-annual effluent report for the second half of 1999. The first half of 2000 had not been issued, however, the raw data was reviewed for consistency.

The licensee's environmental monitoring program consisted of continuous air, groundwater, surface water, and vegetation, as well as ambient gamma exposure rate measurements. The licensee collected the required samples at the five sampling stations, including a nearest resident and a background location.

c. Environmental Air Sampling

Particulate air sampling was performed at four stations using continuous high volume samplers. The background sampling station (BHV-3) was taken down due to vandalism. The sample filters were exchanged weekly and analyzed quarterly for natural uranium, radium-226, thorium-230, and lead-210 concentrations. All sample results for July 1999-December 1999 were 6.4 percent or less of the concentrations specified in 10 CFR Part 20, Appendix B. No adverse trends were identified.

d. Environmental Exposure Rates

Ambient gamma radiation levels were continuously measured at the five sample stations with thermoluminescent dosimeters (TLDs). The TLDs were exchanged and analyzed on a quarterly basis. The sample results varied from 9.7 µR/hr at the background station to 11.1 µR/hr at an onsite sample station (East Tailings Area) for 1999. Ambient gamma exposure rates were found to be below the limits established in 10 CFR 20.1301.

A review of TLD data revealed that each TLD location was less than 12 µR/hr. The average dose rate offsite was determined to be 10-15 µR/hr by surveys, which was comparable to the readings at each TLD location. The licensee reported each TLD location as background corrected.

e. Vegetation

Vegetation samples were collected at three locations around the mill during early spring, late spring, and fall. The samples were analyzed for radium-226 and lead-210 concentrations. Sample results for the second half of 1999 were comparable to those taken in the first half of 1999, with no observable adverse trends.

f. Surface Water Sampling

In accordance with Section 5.5 of the license application, surface water samples are required to be obtained from two locations. Water samples (or sediment samples if the streams are dry) are to be obtained annually from Westwater Creek and quarterly from Cottonwood Creek. The samples were analyzed for their natural uranium, radium-226, and thorium-230 concentrations, as well as their quantity of total dissolved solids. The natural uranium concentration was 2.2 percent of the concentration specified in Appendix B to 10 CFR Part 20.

g. Groundwater Detection Monitoring Program

License Condition 11.3(A) requires the licensee to implement a groundwater detection monitoring program. The licensee's internal procedure entitled "Groundwater Monitoring Plan and Standard Operating Procedures," revised May 1999, was reviewed along with records since the last inspection. Staff involved in groundwater sampling were interviewed. It was determined that the licensee was following proper procedures in this area.

h. Tailings Cell Leak Detection Program

License Condition 11.3(B-E) requires the licensee to implement a monitoring program of the leak detection systems for the disposal cells. The licensee's procedures for tailings management, training and quality assurance were reviewed. The inspector toured the cell area with mill staff responsible for leak detection system field monitoring and observed demonstrations of field protocol. Based on observations of mill staff and the review of records, it was determined that the licensee was properly implementing License Condition 11.3.

i. Radioactive Waste Receipts and Disposal Inspections

The licensee is required to submit an annual summary to the NRC of wastes disposed of from offsite generators in accordance with Condition 10.5.D. The licensee's most current annual summary dated February 17, 2000, was reviewed. During 1999, the licensee received 57 shipments of 11e.(2) byproduct waste for disposal from three individual waste generators. Seven shipments of 11e.(2) waste had been received from offsite generators in 2000. Shipments of 11e.(2) waste were found to have been conducted within the limits of the license.

A review of the licensee's four disposal cells was conducted. Cells 1 and 3 were actively being used for process solution evaporation and recycling, with Cell 3 also used for disposal of tailings generated onsite and wastes generated offsite (as authorized in License Condition 10.5). Cell 2 was being used for disposal of solid wastes generated onsite, and was covered as the cell was filled. Any liquid recovered from Cell 2 operations was transferred to Cell 3. Since Cell 4 was not in service during the inspection, receiving only precipitation. Cell 4 had multiple tears and channels in the liner system, the licensee stated that Cell 4 would not be used until the liner is replaced. No abnormal conditions, such as leaks or berm failures were observed at any of the other cells during the site tour.

4.4 Conclusions

Operational activities were being conducted safely and in accordance with the conditions of the license as well as NRC regulations. A review of the licensee's onsite control of the alternate feed material demonstrated the licensee was maintaining control of the radioactive waste shipments in an orderly, controlled fashion. The licensee was noted to be collecting all environmental monitoring samples required by the license at the intervals specified in the license, as reported in the 1999 semi-annual effluent reports. All sample results were less than the associated effluent release limits specified in 10 CFR Part 20 during 1999. No adverse trends were identified.

5 Followup (92701)

5.1 (Open) IFI 40-8681/9903: Receipt of Hazardous Waste Material at the White Mesa Mill

On October 26, 1999, the licensee inadvertently received and accepted a shipment of potentially hazardous waste material from the Massachusetts Highway Department Central Artery Tunnel project. On the basis of a single analyzed sample, the material contained lead, a hazardous waste. The result of the sample showed a lead concentration of 5.75 milligrams per liter (mg/l) which was above the criteria of 5.0 mg/l for classifying the material as hazardous waste. The lead contaminant most likely originated from automotive exhaust particles that had settled into the soil prior to excavation.

The waste material was erroneously shipped to the site primarily because of a duplication in shipping container numbers. Several programmatic weaknesses helped contribute to the problem including poor control of shipping manifests and use of generic versus specific ore receipt inspection procedures. The licensee's random sampling program would not have identified the wastes because the hazardous constituent (lead) was not one of the constituents that the licensee tested for incoming material. Finally, the shipment of the material was determined not to be under the jurisdiction of the NRC.

An NRC Inspection Followup Item (IFI) was opened to ensure the licensee resolves the mixed waste concerns, disposes of the waste material, and implements corrective actions to prevent recurrence of the incident. The inspectors observed that the licensee had completely excavated the hazardous material and stored the hazardous material in an intermodal container. The licensee was expecting the intermodal container to be shipped in August 2000. This matter will remain open until the waste material is removed from the site. On July 24, 2000, the licensee established a new SOP "Intermodal Container Acceptance, Handling, and Release," to preclude the recurrence of this type of situation. The inspectors noted that the licensee had improved the process for verifying shipment manifests.

6 Exit Meeting Summary

The inspectors presented the preliminary inspection results to the representatives of the licensee at the conclusion of the inspection on July 27, 2000. A telephonic exit briefing was held on August 22, 2000, to discuss the results of the inspection as presented in this report. Licensee representatives acknowledged the findings as presented. The licensee did not identify any information reviewed by the inspector as propriety information.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Hochstein, President
R. Berg, Radiation Safety Officer
W. Deal, Mill Manager
M. Rehmann, Environmental Manager

INSPECTION PROCEDURES USED

83822	Radiation Protection
88005	Management Organization and Controls
88035	Radioactive Waste Management
88045	Environmental Monitoring
92701	Followup

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

40-8681/0001-01	VIO	Failure to follow procedures for alpha detector functional checks (License Condition 9.6).
40-8681/0001-02	URI	NRC determination on whether radioactively contaminated vanadium is a byproduct material or is it an Unimportant Quantity pursuant to10 CFR 40.13.
40-8681/0001-03	VIO	Failure to follow the PBL and utilized the SERP to change the procedure in the license application for uranium and vanadium product surveys (License Condition 9.4).
40-8681/0001-04	VIO	Failure to conduct free release surveys on vanadium product shipments as required by the license (License Condition 9.10).
40-8681/0001-05	NCV	Failure to follow procedures for surveying equipment such as intermodal containers for unrestricted release. (License Condition 9.6)

Closed

none

Discussed

40-8681/9903	IFI	Receipt of hazardous was at the White Mesa Site

LIST OF ACRONYMS USED

ALARA	as low as reasonably achievable
CaF	calcium fluoride
CFR	Code of Federal Regulations
cpm	counts per minute
DOT	Department of Transportation
dpm	disintegrations per minute
IN	Information Notice
IUC	International Uranium Corporation
mg/l	milligrams per liter
µR/hr	microRoentgen/hour
PBL	Performance Based License
pCi/g	picocuries/gram
PDR	Public Document Room
RSO	Radiation Safety Officer
SERP	Safety and Environmental Review Panel
SOP	Standard Operating Procedure
TLD	thermoluminescent dosimeters
URI	Unresolved Item