



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 28, 2016

Dr. Ronald J. Land
Site Manager
AREVA, Inc.
2101 Horn Rapids Road
Richland, WA 99354-0130

**SUBJECT: AREVA NP, INC. (RICHLAND) – NUCLEAR REGULATORY COMMISSION
INTEGRATED INSPECTION REPORT 70-1257/2016-003**

Dear Dr. Land:

The Nuclear Regulatory Commission (NRC) conducted an announced, routine inspection during the second quarter of calendar year 2016 (April 1 to June 30, 2016), at the AREVA NP, Inc., facility in Richland, Washington. The purpose of this inspection was to perform routine reviews of nuclear criticality safety and plant modifications. The enclosed report presents the results of the inspection. At the conclusion of the inspection, the results were discussed with members of your staff at an exit meeting held on April 21, 2016.

During the inspection, NRC staff examined activities conducted under your license, as they relate to public health and safety, to confirm compliance with the Commission's rules and regulations and with the conditions of your license. The inspection consisted of facility walk downs, selective examinations of relevant procedures and records, interviews with plant personnel, and observations of activities. Based on the results of this inspection, no violations of significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of NRC's "Rules of Practice and Procedure," a copy of this letter and its enclosure 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), which is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html>.

R. Land

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If you have any questions, please contact Tom Vukovinsky of my staff at 404-997-4622.

Sincerely,

/RA/

Eric C. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Docket No. 70-1257
License No. SNM-1227

Enclosure:
NRC Inspection Report 70-1257/2016-003
w/Supplemental Information

cc: (See page 3)

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Projects Branch 2
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ADAMS: Yes ACCESSION NUMBER:ML16211A031 SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI				
SIGNATURE	/RA/	/RA/	/RA/				
NAME	TVukovinsky	TSippel	GGoff				
DATE	7/22/2016	7/22/2016	7/22/2016				
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-1257

License No.: SNM-1227

Report No.: 70-1257/2016-003

Licensee: AREVA NP, Inc.

Facility: Richland Facility

Location: Richland, Washington 99354

Dates: April 1 through June 30, 2016

Inspectors: T. Sippel, Fuel Facility Inspector (Section A.1)
D. Hartland, Senior Fuel Facility Inspector (Section B.1)
G. Goff, Fuel Facility Inspector (Section B.1)

Approved by: E. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

AREVA NP, INC. - Richland
NRC Integrated Inspection Report 70-1257/2016-003
April 1 through June 30, 2016

An inspection was conducted by regional inspectors during normal shifts in the areas of nuclear criticality safety and plant modifications. The inspectors performed a selective examination of licensee activities that were accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and a review of facility documents. No safety significant findings were identified during this inspection.

Safety Operations

- The Nuclear Criticality Safety (NCS) program was implemented in accordance with the license application and regulatory requirements. (Paragraph A.1)

Facility Support

- The configuration management program was implemented in accordance with the license application and regulatory requirements. (Paragraph B.1)

Attachment

Key Points of Contact
List of Items Opened, Closed, and Discussed
Inspection Procedures Used
Documents Reviewed

REPORT DETAILS

Summary of Plant Status

The AREVA-Richland facility converts uranium hexafluoride (UF_6) into uranium dioxide (UO_2) for the fabrication of low-enriched fuel assemblies used in commercial light water reactors. During the inspection period, normal production activities were ongoing.

A. Safety Operations

1. Criticality Safety (Inspection Procedure (IP) 88015)

a. Inspection Scope and Observations

The inspectors evaluated the adequacy of the licensee's nuclear criticality safety (NCS) analyses of the industrial waste water treatment facilities, uranium nitrate hexahydrate reprocessing, UO_2 powder production, and other NCS analyses listed below, to assure the safety of fissile material operations through compliance with regulatory requirements of the license application and 10 CFR 70. The inspectors reviewed selected NCS documents (listed in Section 4.0 of the Attachment) to determine whether the criticality safety of selected operations, such as the ion exchange system in the waste water treatment facility, the waste water tanks, and the ammonium diuranate (ADU) steam boiler was assured through engineered and administrative controls, with required safety margin, and preparation and review by qualified staff. The NCS analyses and supporting documents were reviewed to determine if they demonstrated required identification and control of NCS hazards to assure operations within subcritical limits for normal and credible abnormal conditions through appropriate limits on controlled parameters as required by 10 CFR 70.61(d).

The inspectors interviewed NCS engineers, operations engineers, and operators regarding the NCS controls applied to selected processes. These processes included the ion exchange system in the waste water treatment facility, the waste water tanks, and the ADU steam boiler. The inspectors reviewed the NCS analyses for NCS-related items relied on for safety (IROFS), for risk-significant portions of the miscellaneous uranium recovery system, ADU system, and the industrial waste water treatment facilities, to determine whether the performance requirements and licensee commitments to the double contingency principle were met for selected accident sequences. Aspects of IROFS 0.20, 302, 2312, 2318, 2319, 2320, 2321, 2323, 2324, 3527, 6517 used in accident sequences 150-4, 163-39, 163-40, 163-50, 163-51, or 163-53 as listed in the integrated safety analysis (ISA) summary, were inspected as part of this review.

Additionally, the inspectors verified that management measures designated for IROFS 2318 and 2319 were adequate to ensure that the IROFS were available and reliable to perform their intended safety function.

The inspectors performed plant walk downs in the dry conversion facility and in selected areas where powder is handled in drums, such as ADU powder production, the lube blend press feed, and the UO_2 pellet presses, to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory

requirements. The inspectors observed the conduct of the drum tumbling operation, and interviewed operators involved in the operation about the NCS controls applied and how they implemented selected administrative NCS IROFS 1509, 1510, and 1512.

The inspectors accompanied a licensee NCS Engineer and a senior licensee NCS Engineer on portions of their required inspections and observed the conduct of the inspection. The inspectors noted that the walk downs were performed by qualified NCS engineers who are familiar with open NCS issues from previous audits; reviewed the adequacy of control implementation; reviewed procedures and postings; interviewed an area operator; and examined equipment to verify that past analyses remained adequate.

The inspectors reviewed the licensee's NCS program through document review and interviews with licensee NCS engineers and management, to determine if license requirements are being implemented. The inspectors verified that the licensee's NCS analyses are being written, reviewed, and approved by qualified NCS staff according to license requirements. The inspectors verified that NCS staff reviewed potential facility changes that may impact NCS before the change is implemented. The inspectors also reviewed the results of the four most recent NCS audits to confirm that NCS-related issues and corrective actions were being identified, tracked, and resolved.

The inspectors reviewed the licensee's response to a selection of recent internally-reported events identified in Section 4.0 of the Attachment. The inspectors interviewed licensee staff and observed that the events were investigated in accordance with procedures and appropriate corrective actions were assigned and tracked.

b. Conclusion

No violations of NRC requirements were identified.

B. Facility Support

1. Plant Modifications (Inspection Procedure 88070)

a. Inspection Scope and Observations

The inspectors interviewed senior managers, managers, supervisors, and engineers to verify that the licensee has established an effective configuration management system to evaluate, implement, and track plant modifications which could affect safety through compliance with the license application and the requirements of 10 CFR 70.

The inspectors noted that the licensee's work control program had provisions to ensure adequate pre-job planning and preparation of permanent plant modification design packages. The configuration management system had provisions to ensure that permanent plant modifications did not degrade the performance capabilities of IROFS or other safety-related equipment that are part of the design basis.

The inspectors reviewed a sampling of 10 plant modification design packages (listed in Section 4.0 of the Attachment) since the last plant modifications inspection for compliance with regulatory requirements accuracy. The inspectors also reviewed changes made to the ISA Summary during the previous calendar year. The inspectors subsequently walked down and reviewed selected modifications and confirmed that the

“as-built” drawings agreed with the field configurations. The inspectors noted that the licensee had management measures in place to ensure that the IROFS affected by the reviewed facility changes remained capable of performing their intended safety function before approving the modification for operation. The inspectors verified that applicable post-maintenance installation and testing requirements were identified and performed prior to implementation of the selected plant modification design packages. Completed modifications were adequately reviewed prior to implementation and before returning affected equipment to service.

The inspectors noted that the licensee addressed baseline design criteria stipulated in 10 CFR 70.64 in the designs of plant modifications. The inspectors also verified that designs of plant modifications met the specific design criteria specified in the selected modification packages.

The inspectors noted that the licensee addressed the impacts of modifications to the ISA, ISA Summary, and other safety program information developed in accordance with 10 CFR 70.62.

The inspectors reviewed the licensee’s problem identification and resolution program to verify that issues relating to the preparation and installation of plant modifications were entered into the corrective action program, and the effectiveness of corrective actions.

b. Conclusion

No violations of NRC requirements were identified.

C. Special Topics

a. Event Follow-Up

1. (Closed) Licensee Event Report (LER) 70-1257/2016-001-0: Event Notification (EN) 51757 Potential Common Mode Failure of Two IROFS

On February 26, 2016, the licensee reported that two uranium monitors on the ADU waste water effluent line were degraded by a previously unanticipated common cause failure. These uranium monitors are IROFS 2318 and 2319, and are relied on to prevent an unsafe mass of uranium from entering unfavorable geometry waste water tanks. These IROFS are colorimeters, which use the color of solution to determine the amount of uranium present. The event was caused by very high concentrations of copper and nickel contaminants which created a solution whose color masked the presence of uranium. The licensee lab tested hypothetical solutions containing both the high levels of metal interference present during the event, and high uranium concentration near and at the safety limit. Based on these tests, the licensee concluded that for even a bounding solution the metal interference would not have prevented the colorimeters from detecting uranium concentrations at the safety limit. Thus, the IROFS were degraded and not actually failed.

The inspectors walked down the ADU waste water effluent line and downstream tanks. The inspectors interviewed licensee engineers and chemists concerning the functionality of the colorimeters, the lab tests, the system alignment and upset that resulted in the event, other possible upsets, the accident sequences in which the colorimeters are

credited, past experience with metal interference, and corrective actions. The licensee's immediate corrective actions upon discovery of the event, were to shut down the process and use lab sampling to confirm the uranium levels were below the safety limit. Interim corrective actions included the use of lab sampling to ensure the uranium level in the waste stream is verified independently of the colorimeters, and additional controls to prevent the introduction of metals. For their long term corrective actions, the licensee plans to replace the current colorimeters with uranium monitors that are not susceptible to this common mode failure. The inspectors reviewed the licensee's apparent cause analysis (Condition Report (CR)-2016-1378), test records, system drawings, and relevant NCS analyses. The inspectors did not identify any safety concerns, therefore, this item is considered closed.

2. (Closed) LER 70-1257/2016-002-0: 10 CFR 71.95 Report of Non-Compliance with Condition in Certificates of Compliance

A licensee's customer received three containers with fuel assemblies with a loose clamp bolt in each. The licensee entered this condition into their correction action program and the inspectors reviewed the corrective action associated with this event and confirmed that the loose bolt in each case did not impact the ability of the container to restrain the fuel assemblies. The licensee revised the affected procedures to provide a torque requirement on the affected bolts that was consistent with that applied to other similar bolts in the container. The inspectors did not identify any safety concerns, therefore, this item is closed.

D. Exit Meeting

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on April 21, 2016, to R. Land and staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

SUPPLEMENTAL INFORMATION

1. KEY POINTS OF CONTACT

<u>Name</u>	<u>Title</u>
B. Doane	Senior Criticality Safety Engineer
D. Durham	Radiological Protection Supervisor
C. Krajcik	Senior Administrative Assistant
J. Kreitzburg	Criticality Safety Engineer
R. Land	Site Manager
A. Landon	Maintenance Engineer
L. Maas	Licensing and Compliance Manager
C. Manning	Nuclear Criticality Safety Manager
J. Marozzo	Design and Drafting Supervisor
S. Powers	Manager, Project and Reliability Engineering
B. Severson	Corrective Action Program Manager
T. Tate	Environmental, Health, Safety and Licensing Manager
B. Tilden	Operations Manager
J. Veysey	Plant Engineering, Tech Support, & Maintenance
T. Watkins	Reliability Engineer
S. Wright	Safety Manager

Other licensee employees contacted included operators, technicians, production staff, and office personnel.

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

LER 70-1257/2016-01-0	EN 51757 Potential Common Mode Failure of Two IROFS
LER 70-1257/2016-02-0	10 CFR 71.95 Report of non-Compliance with Condition in Certificates of Compliance.

3. INSPECTION PROCEDURES USED

IP 88015	Nuclear Criticality Safety
IP 88070	Plant Modifications

4. DOCUMENTS REVIEWED

Records:

Annual Configuration Control Audit Report - 2015
Configuration Control Assessment Report, dated June 16-18, 2015
E04-07-201511, NCS Audit/Inspection Report – November 2015
E04-07-201512, NCS Audit/Inspection Report – December 2015
E04-07-201601, NCS Audit/Inspection Report – January 2016
E04-07-201602, NCS Audit/Inspection Report – February 2016
E04-NCSA-070, ADU Line - ADU Process, Version 17
E04-NCSA-090, UO₂ Powder Production, Version 15

E04-NCSA-120, UNH Reprocessing, Version 22
 E04-NCSA-150, Miscellaneous Uranium Recovery System (MURS), Version 19
 E04-NCSA-163, Industrial Waste Water Treatment Facilities, Version 25
 E04-NCSA-350, Powder Drum Warehouse (I3A), Version 14
 NCS Infraction 15-034
 NCS Infraction 15-036
 NCS Infraction 15-038
 NCS Infraction 15-041
 NCS Infraction 16-001
 NCS Infraction 16-002
 NCS Infraction 16-003
 NCS Infraction 16-005
 TJJ:16:018, "Follow-up Report to February 25, 2016 Incident Reported Under 10 CFR
 70 Appendix A section (b)(1) (NRC Event No. 51757); AREVA Inc. Richland Facility;
 License No. SNM-1227; Docket No. 70-1257," dated April 26, 2016

Procedures:

E04-06-004, Preparation & Review of Nuclear Criticality Safety Documents, Version 11

Condition Reports Reviewed:

CR 2014-786, CR-2015-8505, CR-2015-8516, CR-2015-8787, CR-2015-9684,
 CR-2015-10016, CR-2016-911, CR-2016-1251, CR-2016-1378

Other Documents:

E04-NCSA-335, BLEU Powder Storage, Version 21, Page 12
 E04-NCSA-335, TNF-XI Inner Powder Container and German B-Pail Filling Storage &
 On-Plant Movement, Version 9.0, Page 9
 ECN 8629 – Ceramics Vault Latch Upgrade (Installation)
 ECN 8715 – Controlled Area Bucket Grid Relocation
 ECN 8725 – BLEU/DCF Barrel Stop Upgrades (CR 2014-786)
 ECN 8738 – ADU U-Monitor Replacement (Startup/Installation)
 ECN 8742 – Nitric Acid to TK-102 (Startup/Installation)
 ECN 8746 – IROFS Steam Check Valve Replacement – UO2 Boiler
 ECN 8747 – MELOX ADU – Equipment Installation
 ECN 8751 – Tank 20A Upgrades (Startup/Installation)
 ECN 8755 – GSUR MERF Improvements
 ECN 8756 – MERF Improvements (Final Routing)
 US Fuel BU Apparent Cause Analysis CR# 2015-10016, Revision (Rev). 0
 US Fuel BU Apparent Cause Analysis CR# 2016-1378, Rev. 0