



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

October 20, 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 70-1257/2016-004**

Dear Dr. Land:

The Nuclear Regulatory Commission (NRC) conducted an announced, routine inspection during the third quarter of calendar year 2016 (July 1 to September 30, 2016), at the AREVA NP, Inc., facility in Richland, Washington. The purpose of this inspection was to perform a routine review of nuclear criticality safety. 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 September 1, 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

2

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 70-1257/2016-004  
w/Supplemental Information

cc: (See page 3)

R. Land

2

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cc:

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U. S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket No.: 70-1257

License No.: SNM-1227

Report No.: 70-1257/2016-004

Licensee: AREVA NP, Inc.

Facility: Richland Facility

Location: Richland, Washington 99354

Dates: July 1 through September 30, 2016

Inspector: N. Peterka, Fuel Facility Inspector (Section A.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 70-1257/2016-004  
July 1 through September 30, 2016

An inspection was conducted by a regional inspector during normal shifts in the area of nuclear criticality safety. The inspector 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 had no violations of NRC requirements identified. (Paragraph A.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<sub>6</sub>) into uranium dioxide (UO<sub>2</sub>) 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

###### *Criticality Analysis*

The inspector reviewed the selected Nuclear Criticality Safety Analyses (NCSAs) and associated assumptions and calculations to verify consistency with the commitments in the License Application, including the consideration of the Double Contingency Principle, assurance of subcriticality under normal and credible abnormal conditions with the use of subcritical margin, technical practices and methodologies, and treatment of nuclear criticality safety (NCS) parameters. The inspector reviewed the selected NCSAs to also determine whether approved NCSAs were available, were of sufficient detail and clarity to permit independent review, and whether calculations were performed within the validated area of applicability and consistent with the validation report. The NCSAs were selected based on factors such as risk-significance, if new or revised, the use of unusual control methods, and operating history. The NCSAs reviewed included E04-NCSA-100, E04-NCSA-120, and E04-NCSA-190, which covers the licensee's process off-gas systems and scrubbers for various processes within the facility. In addition, the NCSAs listed in Section 4 of the Attachment were also reviewed.

The inspector reviewed the licensee's generation of accident sequences to verify whether the NCSAs systematically identified normal and credible abnormal conditions for the analysis of process upsets in accordance with the commitments and methodologies in the License Application. This effort included the review of accident sequences that the licensee determined to be not credible in order to determine whether the bases for incredibility were consistent with the commitments, definitions, and methodologies in the License Application and were documented in sufficient detail to permit an independent assessment of credibility. This review was conducted for the following NCSAs: E04-NCSA-100, E04-NCSA-120, and E04-NCSA-190.

A specific focus for the review of the above NCSAs was the licensee's assumptions on fissile material accumulation within their process off-gas systems, which included the ductwork, HEPA filter banks, and scrubber systems for the systems listed in the *Criticality Implementation* section of the report. The inspector reviewed the licensee's assumptions/justifications within their NCSAs for double contingency and credible accident scenarios, interviewed the appropriate process engineers on system operation/design, interviewed appropriate staff on historical amounts of fissile material accumulation found during inspections, and reviewed the most recent surveillance/maintenance inspections on the above systems.

The inspector verified that no changes to the validation report have been made since the last NCS inspection.

#### *Criticality Implementation*

The inspector performed walk-downs of the Ammonium Diuranate (ADU) Process Off-Gas, Uranium Dioxide (UO<sub>2</sub>) Pellet Dissolution, and Uranyl Nitrate Hexahydrate (UNH) Reprocessing systems with a focus on each system's scrubber and ventilation systems to determine whether existing plant configuration and operations were covered by, and consistent with, the process description and safety basis in the NCSA. The inspector reviewed process and system descriptions and set point analyses to verify that engineered controls established in the NCSAs were included. The inspector's review of controls focused on the inspections of process ductwork and HEPA filter banks. The inspector reviewed operating procedures and postings to verify that selected administrative controls established in the NCSAs were included. The inspector interviewed three operators and three engineers to verify that administrative actions established in the NCSAs were understood and implemented properly in the field.

The inspector reviewed the integrated safety analysis (ISA) summary and supporting ISA documentation to determine whether the controls identified in the ISA were supported by technical bases in the NCSAs.

#### *Criticality Operational Oversight*

The inspector reviewed NCS-related training records to determine whether operator training included instruction in criticality hazards and control methods, whether the licensee's established NCS-related operator training was consistent with commitments in the License Application, and whether NCS staff was involved in the development of operator training. The inspector interviewed operations staff to determine whether they were cognizant of NCS hazards and control methods related to their specific job function. The NCS-related training records reviewed included annual refresher training for operators, system walk-downs, and system specific reviews of engineered IROFS.

The inspector accompanied a licensee NCS engineer on a general walk-down of the facility to determine whether NCS staff routinely inspected fissile material operations to ascertain that criticality requirements were being satisfied. Additionally, the inspector interviewed two NCS engineers and reviewed audit records that had been documented since the last NCS inspection.

#### *Criticality Programmatic Oversight*

The inspector reviewed the selected NCSAs listed above to verify that they were performed in accordance with NCS program procedures and received appropriate independent review and approval. The inspector conducted interviews and reviewed corrective action program (CAP) entries to verify that audit findings were being identified, entered, and tracked to resolution of the issue. The entries reviewed included CR 2016-4144, 2016-4194, and 2016-4452.

#### *Criticality Incident Response and Corrective Action*



The criticality accident alarm system was not inspected during this inspection.

The inspector reviewed selected NCS-related CAP entries to verify whether anomalous conditions were identified and entered into the CAP, whether proposed corrective actions were sufficiently broad, whether they were prioritized on a schedule commensurate with their significance, and whether they were completed as scheduled and addressed the problem identified. The CAP entries reviewed included CR-2016-4918, 2015-9684, and 2014-6889.

b. Conclusion

No violations of NRC requirements were identified.

B. 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 September 1, 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
C. Kahambwe	NCS Engineer
J. Kreitzburg	Criticality Safety Engineer

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

### 2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

### 3. INSPECTION PROCEDURES USED

IP 88015      Nuclear Criticality Safety

### 4. DOCUMENTS REVIEWED

#### Records:

E04-NCSA-100, Line 2 Process Off-gas System, Revision (Rev.) 11, dated December 12, 2014  
E04-NCSA-120, UNH Reprocessing, Rev. 22, dated April, 11, 2016  
E04-NCSA-190, UO2 Pellet Dissolution, Rev. 16, dated February 19, 2016  
E04-NCSA-323, BLEU Powder Receipt and Download, Rev. 20, dated July 6, 2016  
E04-NCSA-960, HVAC Exhaust Systems, Rev. 27, dated July 20, 2016  
E04-NCSS-G07, Building and Facilities NCS Design Requirements Including Initial Conditions and Bounding Assumption, Rev. 6, dated November 11, 2015  
E04-NCSS-G81, 45 Gallon Powder Drums with Neutron Absorbing Inserts, Rev. 19, dated August 4, 2016  
E04-07-201604, NCS Audit/Inspection Report – April 2016  
E04-07-201605, NCS Audit/Inspection Report – May 2016  
E04-07-201606, NCS Audit/Inspection Report – June 2016  
E04-07-201607, NCS Audit/Inspection Report – July 2016

#### Procedures:

C100P003, K32 Duct Inspection 3 Month OPCH  
C120P002, UNH Scrubber #1 12 Month OPCH  
C120P003, UNH Scrubber #2 12 Month OPCH  
C205P005, Scrubber POG K56-18-1 Mystaire 6 Month PF  
C960P001, Duct Inspection 3 Month OPCR

#### Condition Reports Reviewed:

CR 2014-6889, 2015-9684, 2016-4144, 2016-4194, 2016-4452, 2016-4918

Other Documents:

Maintenance Order #11335530, UCAR-Inspect Scrubber Inlets

Maintenance Order #11337287, UCAR-Inspect Ductwork

SYS-070-080-090-100 ADU Conversion, Engineered IROFS Walkthrough Training  
Record