

July 27, 2007

Mr. Charles Perkins, Site Manager
AREVA NP, Inc.
2101 Horn Rapids Road
Richland, WA 99352-5102

SUBJECT: INSPECTION REPORT NO. 70-1257/2007-202

Dear Mr. Perkins:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced criticality safety inspection at your Richland, Washington, facility from July 16 - 19, 2007. The purpose of the inspection was to determine whether activities involving licensed materials were conducted safely and in accordance with NRC requirements. An exit meeting was held on July 19, 2007, during which inspection observations and findings were discussed with your staff.

The inspection, which is described in the enclosure, focused on: (1) changed or new nuclear criticality safety analyses; (2) nuclear criticality safety (NCS) inspections, audits and investigations; and (3) observation of ongoing plant operations. The inspection consisted of analytical basis review, selective review of related procedures and records, examinations of relevant nuclear criticality safety-related equipment, interviews with nuclear criticality safety engineers and plant personnel, and facility walkdowns to observe plant conditions and activities related to safety basis assumptions and related nuclear criticality safety controls. No violations of NRC requirements were identified during this inspection.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and the enclosure will be available in the public electronic reading room of the NRC's Agency-Wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html>.

C. Perkins

-2-

If you have any questions concerning this report, please contact Dennis Morey, of my staff, at (301) 492-3112.

Sincerely,

/RA/

Deborah A. Jackson, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards

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

Enclosure: Inspection Report 70-1257/2007-202

cc w/enclosures: L. J. Maas, AREVA NP
C. D. Manning, AREVA NP
R. E. Link, AREVA NP

cc w/o enclosures: Mr. Gary Robertson, Washington Department of Health

C. Perkins

-2-

July 27, 2007

If you have any questions concerning this report, please contact Dennis Morey, of my staff, at (301) 492-3112.

Sincerely,

/RA/

Deborah A. Jackson, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards

Docket No.: 70-1257

License No.: SNM-1227

Enclosure: Inspection Report 70-1257/2007-202

cc w/enclosures: L. J. Maas, AREVA NP
C. D. Manning, AREVA NP
R. E. Link, AREVA NP

cc w/o enclosures: Mr. Gary Robertson, Washington Department of Health

DISTRIBUTION:

AGooden, RII	DAyres, RI	ASheppard, RII
MBaker	GMorell	FCSS r/f

ML072070114

INDICATE IN BOX: "E"=COPY W/ATT/ENCL; "C"=COPY W/O ATT/ENCL; "N"=NO COPY							
OFFICE	FCSS/TSB	E	FCSS/TSB	E	FCSS/TSB		
NAME	DMorey		RWray		DJackson		
DATE	7/ 26 /07		7/ 27 /07		7/ 27 /07		

OFFICIAL RECORD COPY

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

Docket No.: 70-1257

License No.: SNM-1227

Report No.: 70-1257/2007-202

Licensee: AREVA NP, Inc.

Location: Richland, WA

Inspection Dates: July 16 - 19, 2007

Inspector: Dennis C. Morey, Senior Criticality Safety Inspector, NRC Headquarters

Approved by: Deborah A. Jackson, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards

Enclosure

AREVA NP, Inc.
NRC Inspection Report No. 70-1257/2007-202

EXECUTIVE SUMMARY

Introduction

Staff of the U.S. Nuclear Regulatory Commission (NRC) performed a routine and announced nuclear criticality safety (NCS) inspection of the AREVA NP facility in Richland, Washington from July 16 - 19, 2007. The inspection included an on-site review of the licensee NCS program; NCS analyses; plant operations; NCS inspections, audits and investigations; NCS training; and open item followup. The inspection focused on risk-significant fissile material processing activities in the Uranium Dioxide (UO₂) Building including scrap recovery processes, the blended low-enriched uranium (BLEU) facility, rod and bundle fabrication shops, Engineering Laboratory Operations (ELO), the BLEU fuel area, outside warehouses, and the wastewater facility.

Results

- No safety concerns were identified regarding the licensee NCS program.
- No safety concerns were identified regarding NCS analyses.
- No safety concerns were noted regarding NCS audits.
- No safety concerns were noted during walkdowns of plant operations.

REPORT DETAILS

1.0 Plant Status

The licensee manufactures light water reactor fuel at its Richland Washington facility. During the inspection the licensee was conducting routine dry conversion, powder preparation, pelletizing and fabrication operations. The licensee was also performing routine scrap recycle and waste management operations. The ELO facility was shut down for maintenance during the inspection.

2.0 Nuclear Criticality Safety Program (88015)

a. Inspection Scope

The inspector reviewed the licensee NCS program. The inspector evaluated the adequacy of the program to assure the safety of fissile material operations. The inspector interviewed licensee managers and engineers in the safety and production departments, operations engineers, and selected operators. The inspector reviewed selected NCS-related items relied on for safety (IROFS) to determine that performance requirements have been met for selected accident sequences. During walkdowns, the inspector evaluated the effectiveness of IROFS to assure adequate subcritical margin for normal and credible abnormal conditions. The inspector reviewed selected aspects of the following documents:

- E04-NCSA-080, "Line 2 Uranium Recovery," Version 2.0, dated February 13, 2007
- E04-NCSS-080, "Line 2 Uranium Recovery," dated September 8, 2007
- Drawing CSA-605,938, "UF₆ [uranium hexafluoride] Conversion Line 2 Ion Exchange System Vessel Details," Revision 3, dated November 1998
- Drawing CSA-605,247 Sheet 1, "UF₆ Conversion Line 2 Ion Exchange System Neutron Absorber Insert," Revision 7, dated November 2002
- Drawing CSA-605,247 Sheet 2, "UF₆ Conversion Line 2 Ion Exchange System Neutron Absorber Insert," Revision 1, dated September 1998

b. Observations and Findings

The inspector observed that the licensee had an NCS program which was independent from production and was implemented through written procedures. The inspector also observed that the licensee NCS program reviewed process changes affecting criticality safety.

The inspector reviewed selected criticality safety analyses (CSAs) and determined that appropriate criticality safety accident sequences were identified and controlled consistent with the associated criticality safety evaluation. The inspector reviewed selected IROFS supporting NCS controls on ammonium diuranate (ADU) process vessels and BLEU powder transfer. The inspector determined that IROFS corresponded to the approved analytical results and designated controls and were adequate to meet performance requirements for the selected accident sequences.

c. Conclusions

No safety concerns were identified regarding the licensee NCS program.

3.0 Nuclear Criticality Safety Evaluations and Analyses (88016)

a. Inspection Scope

The inspector reviewed NCS analyses to determine that criticality safety of risk-significant operations was ensured through engineered and administrative controls with adequate safety margin including preparation and review by qualified staff. The inspector accompanied NCS and other technical staff on walkdowns of NCS controls in selected plant areas. The inspector reviewed selected aspects of the following documents:

- E04-NCSA-000, "UF₆ Cylinder Receiving and Storage," Version 4.0, dated May 9, 2007
- E04-NCSS-000, "UF₆ Cylinder Receiving and Storage," dated May 9, 2007
- E04-NCSA-150, "Miscellaneous Uranium Recovery System (MURS)," Version 4.0, dated April 4, 2007
- E04-NCSS-150, "Miscellaneous Uranium Recovery System (MURS)," dated April 4, 2007
- E04-NCSA-163, "Industrial Waste Water Treatment," Version 8.0, dated April 23, 2007
- E04-NCSS-163, "Industrial Waste Water Treatment," dated August 16, 2006
- E04-NCSA-185, "Raffinate Treatment Process," Version 4.0, dated May 25, 2007
- E04-NCSA-205, "Mop Powder Dissolver Facility," Version 4.0, dated February 15, 2007
- E04-NCSA-230, "ELO Scrubber System," Version 2.0, dated May 25, 2007
- E04-NCSA-360, "Lube Blend Press Feed," Version 4.0, dated April 27, 2007
- E04-NCSS-360, "Lube Blend Press Feed," dated April 27, 2007
- E04-NCSA-365, "BLEU Powder Lube Blend," Version 3.0, dated April 27, 2007
- E04-NCSS-365, "BLEU Powder Lube Blend," dated April 27, 2007
- E04-NCSA-370, "UO₂ Pellet Pressing," Version 4.0, dated April 27, 2007
- E04-NCSS-370, "UO₂ Pellet Pressing," dated August 1, 2007
- E04-NCSA-375, "BLEU Pellet Pressing," Version 5.0, dated April 4, 2007
- E04-NCSS-375, "BLEU Pellet Pressing," dated April 4, 2007
- E04-NCSA-390, "UO₂ Pellet Grinding and Inspection," Version 6.1, dated May 25, 2007
- E04-NCSA-670, "Solid Waste Uranium Recovery," Version 3.0, dated May 17, 2007
- E04-NCSA-771, "Warehouse #2 (East End)," Version 4.0, dated April 2, 2007
- E04-NCSA-774, "Warehouse #2 - West Bay," Version 4.0, dated April 2, 2007
- E04-NCSA-830, "Dry Conversion Powder Preparation," Version 6.0, dated April 27, 2007

b. Observations and Findings

The inspector determined that NCS analyses were performed by qualified NCS engineers, that independent reviews were completed for the evaluations by other qualified NCS engineers, that subcriticality of the systems and operations was assured through appropriate limits on controlled parameters, and that double contingency was assured for each credible accident sequence leading to inadvertent criticality.

The inspector determined that for the NCS analysis reviewed, assumptions were appropriate, criticality safety accident sequences were appropriately identified, and NCS controls for equipment and processes met performance requirements and assured the safety of the operations.

c. Conclusions

No safety concerns were identified regarding NCS analyses.

4.0 Nuclear Criticality Safety Inspections, Audits, and Investigations (88015)

a. Inspection Scope

The inspector reviewed licensee internal audit procedures, records of previously completed audits of fissile material operations, and records of NCS infractions. The inspector observed a member of the licensee's NCS staff while they conducted an audit of between building transfers. The inspector reviewed selected aspects of the following documents:

- E04-07-200701, "January NCS Audit," dated February 15, 2007
- E04-07-200702, "February NCS Audit," dated March 16, 2007
- E04-07-200703, "March NCS Audit," dated April 17, 2007
- E04-07-200704, "April NCS Audit," dated May 11, 2007
- E04-07-200705, "May NCS Audit," dated June 18, 2007
- E04-NCSA-761, "Between Building Transfer," Version 5.0, dated July 13, 2006
- E04-NCSS-761, "Between Building Transfer," dated July 13, 2006

b. Observations and Findings

The inspector found that NCS audits were conducted according to procedural requirements. The inspector noted that NCS audits were focused on determining that plant operations requirements conform to those listed in the applicable NCS specification documents. During the audit of between building transfers, the inspector observed that the licensee's NCS auditor examined NCS postings, labels, IROFS, and other controls. The inspector also noted that the licensee's NCS auditor observed operations personnel perform selected tasks and questioned operations personnel about NCS limits and controls.

The inspector observed that the documentation of NCS infractions contained in monthly NCS audit reports included a description of the event, corrective actions taken, current status, an evaluation of whether any IROFS had degraded or failed, and an evaluation of

reportability to the NRC.

c. Conclusions

No safety concerns were noted regarding NCS audits.

5.0 Plant Activities (88015)

a. Inspection Scope

The inspector performed plant walkdowns to review activities in progress and to determine whether risk-significant fissile material operations were being conducted safely and in accordance with regulatory requirements. The inspector interviewed operators, NCS engineers, and process engineers both before and during walkdowns. The inspector reviewed selected aspects of the following documents:

- E04-NCSA-325, "BLEU Powder Preparation," Version 5.0, dated July 5, 2007
- E04-NCSS-325, "BLEU Powder Preparation," dated July 5, 2007
- E04-NCSA-770, "Warehouse #6," Version 4.0, dated April 2, 2007
- E04-NCSA-777, "Planar Array Storage of SNM [special nuclear material] in Sea-Land Containers and Warehouses," Version 5.0, dated February 23, 2007
- E04-NCSA-780, "Waste Handling," Version 3.0, dated February 19, 2007

b. Observations and Findings

The inspector performed walkdowns of the UO₂ Building including scrap recovery processes, the BLEU facility, rod and bundle fabrication shops, ELO, the BLEU fuel area, outside warehouses, and the wastewater facility. The inspectors noted that observed operations were performed in accordance with written procedures.

c. Conclusions

No safety concerns were noted during walkdowns of plant operations.

6.0 Open Item Follow-up

IFI 70-1257/2004-203-03

This item tracks the licensee's evaluation of the impact of uranium-hydrocarbon benchmarks. During a previous inspection, the inspector noted that the licensee's collection of benchmark experiments did not include uranium-hydrocarbon systems. The inspector had determined through interviews with licensee NCS staff that uranium-hydrocarbon systems (e.g., pellet press oil) existed at the facility and were routinely modeled in NCS calculations. The licensee acknowledged the lack of applicable benchmarks in the validation report and agreed to further evaluate the impact of uranium-hydrocarbon systems on bias. The licensee performed a qualitative review establishing the suitability of the existing benchmark set and determined that there would be limited value to further analysis. During a subsequent inspection, the inspector determined that qualitative analysis was not adequate for demonstrating the impact of

hydrocarbons on the licensee benchmark set and the licensee indicated that the facility validation report would be revised to address the impact of the uranium-hydrocarbon benchmarks. During the current inspection, the inspector reviewed selected aspects of the following document:

- E04-NCSA-2670, "Software Validation Document - PC-Scale 4.4A Validation," Version 1.0, dated June 22, 2007

The inspector determined that the licensee had revised the facility validation report and had developed a new area of applicability for uranium-hydrocarbon systems along with an applicable bias. The inspector noted that the new uranium-hydrocarbon bias is significantly larger than the previous bias and licensee is in the process of revising NCS analysis and integrated safety analysis accident descriptions to incorporate the new bias. The inspector did not identify any area where safety limits were affected by the new bias. This item is closed.

7.0 Exit Meeting

The inspector communicated the inspection scope and results to members of AREVA NP management throughout the inspection and during an exit meeting on July 19, 2007. Licensee management acknowledged and understood the findings as presented.

SUPPLEMENTARY INFORMATION

1.0 List of Items Opened, Closed, and Discussed

Items Opened

None.

Items Closed

IFI 70-1257/2004-203-03 Tracks the licensee's evaluation of the impact of uranium-hydrocarbon benchmarks.

Items Discussed

None.

2.0 Inspection Procedures Used

IP 88015 Nuclear Criticality Safety Program
IP 88016 Nuclear Criticality Safety Evaluations and Analyses

3.0 Key Points of Contact

AREVA NP, Inc. - Richland

C. Perkins	Site Manager
C. Manning	Manager, NCS
W. Doane	NCS Team Leader
L. Maas	Manager, Regulatory Compliance
R. Link	Manager, Environmental, Health, Safety, and Licensing
K. Kulesza	NCS Engineer
J. Payne	Maintenance

NRC

D. Morey Senior Criticality Safety Inspector, NRC Headquarters

All attended the exit meeting on July 19, 2007

Attachment

4.0 List of Acronyms and Abbreviations

ADAMS	Agency-Wide Document Access and Management System
ADU	ammonium diuranate
AREVA NP	AREVA Nuclear Power, Inc. (current company name)
BLEU	blended low-enriched uranium
CSA	criticality safety analysis
ELO	Engineering Laboratory Operations
IFI	inspector follow-up item
IP	inspection procedure
IROFS	item relied on for safety
NCS	nuclear criticality safety
SNM	special nuclear material
UF ₆	uranium hexafluoride
UO ₂	uranium dioxide