

October 21, 2009

EN 45310

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

SUBJECT: INSPECTION REPORT NO. 70-1257/2009-202 AND NOTICE OF VIOLATION

Dear Mr. Perkins:

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine announced criticality safety inspection at your Richland, Washington, facility from September 18-23, 2009. 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 September 23, 2009, during which inspection observations and findings were discussed with your staff.

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

Based on the results of this inspection, NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy included on the NRC's web site at www.nrc.gov; select **Public Meetings & Involvement**, then **Enforcement Policy**. The violation is being cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by NRC during the inspection. The violation being cited as a Severity Level IV is the failure to prevent non-favorable geometry containers from entering a process area where such containers are prohibited.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

C. Perkins

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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>.

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

Sincerely,

/RA/

Patricia A. Silva, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

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

Enclosure: Inspection Report 70-1257/2009-202

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 -

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NOTICE OF VIOLATION

AREVA NP, Inc.
Richland, Washington

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

During a U.S. Nuclear Regulatory Commission (NRC) inspection from September 18 through 23, 2009, a violation of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violation is listed below.

Safety Condition S-1 of Special Nuclear Material License No. 1227 requires that material be used in accordance with the statements, representations, and conditions in the license application dated October 24, 2006, and supplements thereto.

Section 5.3.7 of the License Application states, in part, that operations in which nuclear criticality safety is pertinent shall be governed by written procedures and that personnel working with SNM shall follow these procedures.

E04-NCSA-120, "UNH Reprocessing," Revision 9.0, dated May 28, 2009, prohibits the presence of unfavorable geometry containers in Room 102A.

E04-NCSS-G03, "Glossary of Terms," Revision 4, dated June 15, 2009, defines unfavorable geometry containers as containers having a volume exceeding 5.5 gallons and defines an open container as a plastic bag left in the open position.

Contrary to the above, on and before June 24, 2008, the licensee failed to exclude unfavorable geometry containers from Room 102A. Specifically, two plastic bags with a volume greater than 5.5 gallons were found in the room in the open position.

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

Pursuant to the provisions of 10 *Code of Federal Regulations* (10 CFR) 2.201, AREVA NP, Inc., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with copies to the Chief, Technical Support Branch, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, and Regional Administrator, Region II, 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: (1) the reason for the violation, or, if contested, the basis for disputing the violation; (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 previously 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 Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other actions as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Enclosure 1

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room, or from the NRC's document system (ADAMS), accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public 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 21 day of October 2009

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

Docket No.: 70-1257

License No.: SNM-1227

Report No.: 70-1257/ 2009-202

Licensee: AREVA NP, Inc.

Location: Richland, WA

Inspection Dates: September 18-23, 2009

Inspectors: Dennis Morey, Senior Criticality Safety Inspector, NRC Headquarters
Christopher Tripp, Criticality Safety Inspector, NRC Headquarters

Approved by: Patricia A. Silva, Chief
Technical Support Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Enclosure 2

EXECUTIVE SUMMARY

**AREVA Nuclear Power, Inc.
U.S. Nuclear Regulatory Commission
Inspection Report No. 70-1257/ 2009-202**

Introduction

Staff of the U.S. Nuclear Regulatory Commission performed a routine and announced nuclear criticality safety (NCS) inspection of the AREVA Nuclear Power Inc. (AREVA NP) facility in Richland, Washington from September 18-23, 2009. The inspection included an on-site review of the licensee's NCS program; NCS analyses; plant operations; NCS inspections, audits and investigations; NCS events; and open item follow-up. The inspection focused on risk-significant fissile material processing activities in the Dry Conversion Facility (DCF), the Engineering Laboratory Operations (ELO), the Line #2 Ammonium Diuranate (ADU) conversion area, the Uranium Dioxide (UO₂) Building including scrap recovery processes, the blended low-enriched uranium (BLEU) facility, the BLEU powder storage area, and outside powder storage warehouses.

Results

- A Severity Level IV violation was identified regarding the presence of prohibited unfavorable geometry containers (open and unattended plastic bags larger than 5.5 gallons) in Room 102A.
- A weakness was identified regarding accident sequences for moderator intrusion into moderation control areas in a process room.
- No other safety concerns were identified regarding the licensee NCS program.
- No safety concerns were identified regarding NCS audits.
- With the exception of the weakness identified above, no other safety concerns were identified regarding NCS internal event review and follow-up.
- No safety concerns were identified regarding the criticality alarm system. Final conclusions regarding a criticality alarm event, which was reported to the NRC as EN 45310, will be discussed in a Region II inspection report 70-1257/2009-006.
- With the exception of the violation identified above, no other safety concerns were identified 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 bundle fabrication operations. The licensee was also performing routine scrap recycle and waste management operations.

2.0 Nuclear Criticality Safety Program (IP 88015 & 88016)

a. Inspection Scope

The inspectors reviewed the licensee's NCS program and analyses. The inspectors evaluated the adequacy of the program and analyses to assure the safety of fissile material operations. The inspectors interviewed licensee managers and engineers in the safety and production departments, operations engineers, and selected operators. The inspectors 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 inspectors evaluated the effectiveness of IROFS to assure adequate subcritical margin for normal and credible abnormal conditions. The inspectors reviewed selected aspects of the following documents:

- E04-NCSA [nuclear criticality safety analysis]-130, "Conversion of UO₂ Pellets to U₃O₈ Powder," Revision 6, dated September 1, 2009
- E04-NCSA-135, "BLEU Scrap Recovery," Revision 7, dated July 16, 2009
- E04-NCSA-140, "ELO [Engineering Laboratory Operations] Pellet Dissolver," Revision 4, dated September 1, 2009
- E04-NCSA-190, "UO₂ Pellet Dissolution," Revision 6, dated July 17, 2009
- E04-NCSA-350, "Powder Drum Warehouse," Revision 5, dated September 1, 2009
- E04-NCSA-830, "Dry Conversion Powder Preparation," Revision 10, dated July 16, 2009
- E04-NCSA-2670, "Software Validation Document – PC-SCALE 4.4A Validation," Version 1.1, dated June 16, 2009
- E04-NCSA-120, "UNH Reprocessing," Version 9.0, dated May 28, 2009
- E04-NCSA-140, "ELO Pellet Dissolver," Version 4.0, dated September 1, 2009
- E04-NCSA-820, "Dry Conversion Powder Production Process," Version 6.0, dated May 27, 2009
- E04-NCSA-328, "DCF Scrap Download Hood Operations," Version 1.0, dated January 27, 2009
- E04-NCSA-395, "BLEU Pellet Grinding," Version 5.0, dated July 6, 2009
- E04-NCSA-335, "TNF-XI Inner Powder Container and German B-Pail Filling, Storage & On-Plant Movement," Version 4.0, dated June 25, 2009

b. Observations and Findings

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

The inspectors reviewed the licensee validation document E04-NCSA-2670, and noted that there were no changes from the previous version. The licensee stated that a new version of the validation document had been issued as the result of a mandatory two-year review. The inspectors reviewed NCSAs with recently revised calculations to confirm that analytical conclusions were within the area of applicability covered by the validation. While the validation document did not specify the covered range of neutron energy spectra, the inspectors confirmed that the reviewed calculations had similar geometry, material composition, and spectral characteristics (i.e., thermal) to the benchmarks used in the validation document.

The license application allows use of a 0.97 k_{eff} limit if justified by a sensitivity analysis, and documented to clearly discuss the sufficiency of the margin of subcriticality in terms of the parameters being controlled. The inspectors reviewed the sensitivity studies in E04-NCAS-120 and determined that adequate subcritical margin for the 0.97 k_{eff} limit was demonstrated in terms of system parameters such as moderation and powder density.

The inspectors reviewed selected IROFS supporting NCS controls on the ADU process and in the ELO. The inspectors 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

With the exception of a Severity Level IV violation and weakness discussed below, no other safety concerns were identified regarding the licensee NCS program.

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

a. Inspection Scope

The inspectors reviewed the licensee's internal audit procedures, and observed an ongoing NCS audit which was performed during the inspection. The inspectors reviewed selected aspects of the following documents:

- E04-06-002, "Routine NCS Audits," Revision 2, dated June 17, 2008

b. Observations and Findings

The inspectors observed a licensee audit of uranium powder storage warehouses. The inspectors found that the NCS audit was conducted according to procedural requirements. The inspectors noted that the NCS audit was focused on determining that

plant operations requirements conform to those listed in the applicable NCS specification documents.

The inspectors accompanied a licensee NCS engineer on the audit of uranium powder storage warehouses and observed preparation for the audit and interactions with operators during the audit. The inspectors observed the auditing engineer identify an NCS infraction during the audit. The inspectors noted that the infraction was addressed in accordance with licensee procedures.

c. Conclusions

No safety concerns were noted regarding NCS audits.

4.0 Nuclear Criticality Safety Event Review and Follow-up (IP 88015)

a. Inspection Scope

The inspectors reviewed the licensee's response to internally-reported events. The inspectors reviewed the progress of investigations and interviewed licensee staff regarding immediate and long-term corrective actions. The inspectors reviewed selected aspects of the following documents:

- Condition Report CR 2009-1054, dated February 18, 2009
- Condition Report CR 2008-5372, dated October 3, 2008
- Condition Report CR 2009-4490, dated July 15, 2009
- Condition Report CR 2009-4732, dated July 24, 2009
- Condition Report CR 2009-4849, dated August 2, 2009
- Condition Report CR 2009-5300, dated August 19, 2009
- Condition Report CR 2009-2245, dated April 14, 2009
- Condition Report CR 2009-2745, dated May 4, 2009

b. Observations and Findings

The inspectors reviewed selected licensee internally-reported events. The inspectors observed that internal events were investigated in accordance with written procedures and appropriate corrective actions were assigned. The inspectors noted that there were several condition reports that appeared to be repeated occurrences, and reviewed them in more detail to determine whether the licensee's corrective actions were adequate. CR 2009-4490 and CR 2009-4849 both involved overflows of water from the 907 scrubber system located in Room 101A. Room 101A contains moderation control areas where drums of powder are stored and/or opened for connecting with the process, and these areas experienced moderator intrusion during the events. The inspectors noted that the causes of the two events were different. In CR 2009-4490, the overflow was caused by a pump seal leak. In CR 2009-4849, the overflow came from the process off-gas high efficiency particulate air filter bank following failure of a pressure gauge. The inspectors determined that the corrective actions appeared to be effective, and that the occurrence of the two events did not appear related. The inspectors examined other recent events

and noted that several similar events had occurred in recent years. Three similar leaks into the Room 101A moderation control area occurred in 2009 (CR 2009-1054, 2009-4490, and 2009-4849), one occurred in 2008 (CR 2008-5372), and a previous event had occurred in 2005.

The inspectors noted that accident sequence 7.2 in E04-NCSA-120, Version 9.0, "UNH Reprocessing," dated May 28, 2009, established an initiating event frequency index for having a flood or spray from liquid lines of -1. IROFS consisting of neutron absorbing inserts, mass controls on drums without inserts, and integrity of the drum, produced a combined likelihood index of -9. Although the five events listed above all had different causes, the inspectors indicated that the frequency of leaks into the moderation control area of Room 101A greatly exceeded that assumed in the NCSA. The licensee stated that it was currently in the process of reviewing E04-NCSA-120 as part of its five-year update, and had not determined how it would handle the affected accident sequence. The licensee stated that the initiating event in sequence 7.2 makes reference to a "large" leak or spill, although what constitutes a "large" leak or spill is not defined. The inspector reviewed the licensee's checklist for conducting ISA meetings, which specifies reviewing condition reports and other operational information to ensure that assumptions in the NCSA remain valid. The licensee showed the inspector another sequence that was already slated for revision in the draft currently in progress, in which the initiating event frequency was to be increased based on operational experience. The licensee indicated that the current initiating event frequency for sequence 7.2 appeared non-conservative given recent events, and that it would also likely be reduced.

The inspectors walked down Room 101A and noted that the moderation control areas were only a few feet from the 907 scrubber and an associated criticality drain, and that there were no apparent barriers to liquid water entering the areas. However, the fissile material drums consist of containers that are sealed (except when they are in a hood) and elevated significantly above floor level. In the unlikely event of a large flood, the water would drain away through the room door before reaching a level where it would come into contact with the drums. Based on the engineered controls in place, sequence 7.2 will still meet the performance requirements even with an initiating event frequency significantly higher than what is credited, and so is not a violation. Revision of accident sequences for moderator intrusion into the moderation control areas of Room 101A will be tracked as **Inspection Follow-up Item (IFI) 70-1257/2009-202-01**.

In CR 2009-2245, operators ran the BLEU grinder centrifuge without the centrifuge bowl present, resulting in part from switching between two different centrifuges connected to the grinder. Corrective actions included adding signs on the centrifuges to specify that bowls must be installed prior to starting. The inspectors determined that the centrifuge bowl was an NCS control because, if it is not present, fissile material will accumulate in the recirculating water beyond equipment safety limits. The inspectors noted to the licensee that the NCS purpose of the centrifuge bowl could be more clearly explained in the NCSA. The inspectors concluded that NCS controls for the BLEU grinder centrifuge equipment are adequate to ensure safety.

The inspectors reviewed other condition reports and concluded that corrective actions were acceptable. The inspectors had no other safety concerns regarding licensee reporting, investigation, and correction of internal NCS related events.

c. Conclusions

A weakness was identified regarding accident sequences for moderator intrusion into moderation control areas in a process room.

No other safety concerns were identified regarding NCS internal event review and follow-up.

5.0 Criticality Alarm Systems (IP 88017)

a. Inspection Scope

The inspectors reviewed documentation of criticality accident alarm detector coverage and interviewed engineering and maintenance staff to determine the adequacy of the licensee criticality alarm system.

b. Observations and Findings

The inspectors reviewed a recent event at the facility which resulted from incorrect wiring of the criticality alarm system detector signal cables. During a recent source check of the criticality alarm system, the licensee discovered that the signal from two of three detectors in one of nine detector locations in the facility were non-functional. The licensee determined that the two malfunctioning detectors were not passing the alarm signal to the comparator for that location. Each detector had two three-wire cables, a power cable and a signal cable. To avoid confusing these cables, the licensee used a three-pin connectors for the power cables and six-pin connectors for the signal cable. The six-pin connector had mirror image male/female ends as shown in **Figure 1**. The licensee set up the six-pin signal cable with three wires and performed a continuity check before placing the cable in operation. The licensee determined that the two malfunctioning cables had been wired incorrectly and the continuity check was also performed incorrectly. As a result of the mis-wiring, the detectors could not pass either an alarm or a fault signal so that the entire three-detector unit was rendered inoperable. The inspectors reviewed criticality accident alarm system placement calculations to determine how coverage of the facility was affected. Final conclusions regarding the event, which was reported to the NRC as EN 45310, will be discussed in a Region II inspection report 70-1257/2009-006.

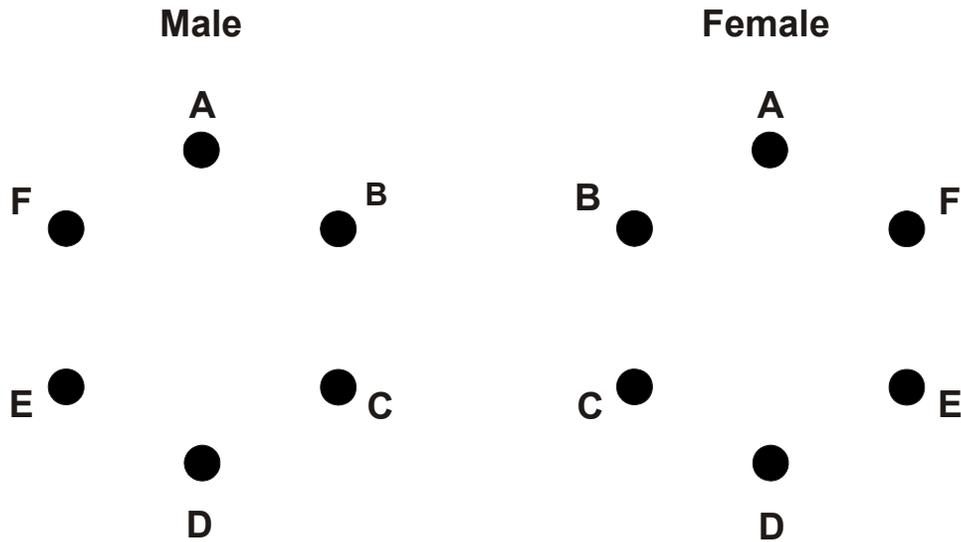


Figure 1
Six-Pin Connector Configuration

c. Conclusions

No safety concerns were identified regarding the criticality alarm system. Final conclusions regarding a criticality alarm event, which was reported to the NRC as EN 45310, will be discussed in a Region II inspection report 70-1257/2009-006.

6.0 Plant Activities (IP 88015)

a. Inspection Scope

The inspectors 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 inspectors interviewed operators, NCS engineers, and process engineers both before and during walkdowns. The inspectors reviewed selected aspects of the following documents:

- E04-NCSA-120, "UNH Reprocessing," Revision 9, dated May 28, 2009
- E04-NCSS [nuclear criticality safety specification]-G03, "Glossary of Terms," Revision 4, dated June 15, 2009
- NCSP-G01-007, "NCS Posting – Unfavorable Containers are not Allowed in this Room," Revision 1, dated January 23, 2004

b. Observations and Findings

The inspectors performed walkdowns of DCF, the Line #2 ADU conversion area, the UO₂ Building including scrap recovery processes, the BLEU facility, the BLEU powder storage area, and outside powder storage warehouses. During the plant walkdowns, the inspectors entered the UNH tank gallery, Room 102A. In Room 102A, the inspectors observed two large plastic trash bags filled with pump parts. The plastic bags are shown in **Figures 2 and 3**.



Figure 2
View Showing Bag Location in Room 102A

The inspectors noted that the door to Room 102A contained a criticality safety posting stating that “unfavorable geometry containers are not allowed in this room/area.” The inspectors reviewed the licensee glossary of terms and determined that the licensee had defined unfavorable geometry items as those that would retain fissile material that exceeds the following: a 3.6-inch depth, a 5.5-gallon volume, or a 7.7-inch diameter. The inspectors also noted that the licensee had defined an open container as any items which could hold liquid in the event of an accident or process upset. An example of an open container is described as “Plastic bag left in the open position.”



Figure 3
Close View Showing Openings and Proximity to Piping

The licensee investigated and determined that the bags had been placed in the room by operators to allow a dismantled pump to decay briefly before being removed from the contaminated area. The licensee noted that the presence of the bags in Room 102A was an NCS infraction. The inspectors noted that posting NCSP-G01-007 prohibiting unfavorable geometry containers in Room 102A is a procedural requirement intended to implement IROFS 3503 in that area. The presence of open and unattended plastic bags larger than 5.5 gallons in Room 102A is **Violation (VIO) 70-1257/2009-202-02**.

With the exception of the noncompliance discussed above, the inspectors noted that observed operations were performed in accordance with written procedures.

c. Conclusions

A Severity Level IV violation was identified regarding the presence of prohibited unfavorable geometry containers (open and unattended plastic bags larger than 5.5 gallons) in Room 102A.

With the exception of the violation identified above, no other safety concerns were identified during walkdowns of plant operations.

7.0 Open items

VIO 70-1257/2009-201-01

This item concerned the failure to establish moderator controls which ensure that k_{eff} will not exceed 0.97 for large powder blenders and large powder spills. During a previous inspection, the inspectors identified accident sequences initiated by the intrusion of 18.43 kilograms (approximately 18.5 liters) of water into process equipment. To control these accident sequences, the licensee implemented IROFS consisting of prohibitions on containers larger than a nominal five gallons (approximately 20 liters). The inspectors determined that these IROFS could not actually prevent a liquid spill of less than 20 liters from occurring. In its response to the NOV dated June 12, 2009, the licensee summarized corrective actions taken and committed to additional actions to prevent recurrence. The licensee stated that these corrective actions would be completed by August 31, 2009.

During this inspection, the inspectors toured the affected operations and examined the licensee's corrective actions. The inspectors reviewed the licensee's formal Justification for Continued Operations (JCO), Apparent Cause Analysis (ACA), condition report (CR 2009-2323), revision to E04-06-004, Version 5.0, "Preparation and Review of Nuclear Criticality Safety Documents," and revised accident sequences associated with IROFS 1114 and 4712. The JCO is based on a new limit to prohibit spillable liquids greater than three gallons. The ACA identified the main cause of the violation as being inadequate guidance to authors of NCS documents. The inspector confirmed that E04-06-004 had been revised to include an attachment to provide clearer guidance on the development of the accident sequence tables in NCSAs, including specifying that "When a qualitative assessment is used to determine that a quantitative limit will be met, the justification of that determination shall be footnoted (e.g., 5-gallon container volume to prevent 17 kg of liquid from entering a spill of unmoderated SNM)." The inspector reviewed the revision to E04-NCSA-325, Version 9.0, "BLEU Powder Preparation," dated July 16, 2009, and E04-NCSA-830, Version 10.0, "Dry Conversion Powder Preparation," dated July 16, 2009, and determined that the description of IROFS 4712 and 1114 had been changed by adding a clarifying note to the effect that the safety function of the IROFS was to limit the amount of moderator spilled to less than 18 kg.

The inspectors toured the affected areas and observed that they had been posted with the three gallon-limit. The inspectors noted that the height and placement of ports on the affected process equipment would make it difficult to spill the entire contents of a 5-gallon container into the powder. The inspectors also reviewed a videotape of a test in

which liquid was poured from such a container on the mezzanine above a large powder blender into an open plastic bag covering the nearest port on the blender, to measure how much water would realistically be expected to enter the material. The amount was measured to be substantially less than 18 liters.

The inspectors concluded that the licensee had completed its corrective actions as indicated in its June 12, 2009, letter. Based on the temporary restriction to less than 3 gallons and the physical configuration of the equipment, the inspectors concluded that powder operations were currently safe with regard to hazards posed by spillable liquids. The NRC's letter dated September 1, 2009, concluded that the licensee's actions to prevent recurrence were inadequate. As of the close of this inspection, a response from the licensee had not been received. This item remains open.

IFI 70-1257/2009-201-02

This item tracks the correction of the inconsistent dry conversion process moderator control descriptions in the safety and implementation documents. The item was opened during a previous inspection based on the identification of different descriptions of the same IROFS in various documents. While reviewing the controls on moderator for the dry conversion process, the inspector noted discrepancies between various descriptions of IROFS 1114 such as:

- (1) IROFS 1114 as described in NCSA-830: "The total volume of spillable liquid in the Dry Conversion processing area is administratively limited to ≤ 5 gallons;"
- (2) IROFS 1114 as described in the Integrated Safety Analysis Summary: "The total volume of spillable liquid in the subject facility is administratively limited to no more than 5 gallons;" and,
- (3) Specified requirements provided to the Engineering and Operations Division [NCSS-800] for implementation (A-2) "No more than two containers of liquid with a volume between 1 and 20 liters are permitted in the UF₆ Vaporization, Powder Production, and Powder Preparation process areas," and (A-3) "unlimited liquid bearing containers with a volume less than 1 liter are permitted."

During the current inspection the inspectors noted that the licensee had revised documents as follows:

- (1) IROFS 1114 is now described NCSA-830: "The total volume of spillable liquid in each Dry Conversion processing area (each level of powder prep is a different process area) shall be limited to a nominal 5 gallons;"
- (2) Specified requirements provided to the Engineering and Operations Division [NCSS-800] for implementation now read:
 - (A-1) The maximum nominal volume of any liquid bearing container allowed in the Moderator Controlled areas of the DCF is a nominal 5 gallon container (20 liters).

- (A-2) No more than one container of liquid with a volume between 1 and 20 liters (0.26 to nominal 5 gallons) shall be permitted in each of the following process areas:
- a. UF₆ Vaporization Room
 - b. Powder Production (4 areas, one per level)
 - c. Powder Preparation (4 areas, one per level):

- (A-3) The number of liquid bearing containers with a volume of less than one liter is not limited, but those containers shall not be stored in the process area. Note that the 1 liter eyewash station near the battery charger is specifically allowed.

The inspectors will review the consistency of the above changes and their effect on implementation of moderator controls during a future inspection. This item remains open.

8.0 Exit Meeting

The inspectors communicated the inspection scope and results to members of AREVA on September 23, 2009. The licensee's management acknowledged and understood the findings as presented.

SUPPLEMENTARY INFORMATION

1.0 List of Items Opened, Closed, and Discussed

Items Opened

- IFI 70-1257/2009-202-01** Tracks revision of accident sequences for moderator intrusion into the moderation control areas of Room 101A.
- VIO 70-1257/2009-202-02** Failure to observe limits regarding the presence of prohibited unfavorable geometry containers in Room 102A.

Items Closed

- IFI 70-1257/2009-201-02** Tracks the correction of inconsistent dry conversion process moderator control descriptions in safety and implementation documents.

Items Discussed

- VIO 70-1257/2009-201-01** Failure to implement moderator controls on spillable liquids to ensure that k_{eff} does not exceed 0.97 for large quantities of uranium oxide powder.

2.0 Inspection Procedures Used

- IP 88015 Nuclear Criticality Safety (NCS) Program
IP 88016 NCS Evaluations and Analyses
IP 88017 Criticality Alarm Systems

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

NRC

- Dennis Morey Senior Criticality Safety Inspector, NRC Headquarters
Christopher Tripp Criticality Safety Inspector, NRC Headquarters

All attended the exit meeting on September 23, 2009.

Attachment

4.0 List of Acronyms and Abbreviations

ACA	Apparent Cause Analysis
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
DCF	Dry Conversion Facility
ELO	Engineering Laboratory Operations
IP	inspection procedure
IROFS	item relied on for safety
JCO	Justification for Continued Operations
NCS	nuclear criticality safety
NCSA	nuclear criticality safety analysis
NCSS	nuclear criticality safety specification
NRC	Nuclear Regulatory Commission
SNM	special nuclear material
U ₃ O ₈	uranium oxide
UF ₆	uranium hexafluoride
UNH	uranyl nitrate hexahydrate
UO ₂	uranium dioxide
VIO	Violation