

SAFETY EVALUATION REPORT

DOCKET: 70-1227

LICENSEE: AREVA INC.
2101 Horn Rapids Road
Richland, WA 99354-0130

SUBJECT: APPLICATION FOR INCREASED U-235 POSSESSION LIMIT FOR THE AREVA INC. RICHLAND FUEL FABRICATION FACILITY; LICENSE NO. SNM-1227; DOCKET NO. 70-1257

BACKGROUND INFORMATION

By letter dated September 23, 2014, AREVA Inc's. (AREVA), submitted a request for U.S. Nuclear Regulatory Commission (NRC) to amend the special nuclear material license SNM-1227 for the Richland facility (ML14345B026). The license amendment request (LAR) solicited an increase in the uranium-235 (U-235) possession limits associated with license SNM-1227 from [REDACTED]. The increased possession limit are requested to allow additional cold storage of 30-B UF₆ cylinders in overpacks at the Richland facility and does not change production throughput. The storage is being provided on behalf of AREVA's own utility customers as well as on behalf of the utility customers of other domestic fuel fabricators. The application and supplemental information provided a justification for the increase and included an assessment of the impacts of the proposed possession limit increase on the facility's major environmental, safety and health programs.

By letter dated December 10, 2014 (ML14345B026), AREVA provided supplemental information with respect to its request to increase its possession limits of U-235 authorized by NRC License Number SNM-1227. More specifically, the supplement expanded upon the impact the increased material would have on decommissioning of the Richland Fuel Fabrication Facility.

On December 16, 2014, the NRC staff accepted this licensing action.

A teleconference was held between AREVA and NRC staff on February 10, 2015 (ML15050A515), in which AREVA provided additional clarification on some fire safety aspects of AREVA's request.

DISCUSSION

In this amendment request, AREVA indicated that the increase in UF₆ possession limits is necessary to provide a commercial solution for the UF₆ storage needs of other domestic fuel facilities, and to maintain a reasonable margin between actual U-235 possession quantities and its U-235 possession limit. Additionally, AREVA indicated that the increased possession limit will not translate into an increase in plant production throughput; introduce any new processes, waste streams, or environmental effluents; and can be fully accommodated on existing UF₆ cylinder storage facilities. The cylinder storage facilities are appropriately covered by the environmental dosimetry program and are located within the confines of the current Controlled Access Area.

The NRC staff performed a detailed safety review of this request and revised the following license conditions of License SNM-1227: License Condition 3.B. [REDACTED]

The NRC staff revised this license condition to allow the increase of possession limit that AREVA may possess at any one time of uranium enriched up to 5.00 wt. % U-235. The following dates were added: September 23, 2014, the date of this amendment request and December 10, 2014, date of the supplemental information.

S-1 Authorized use: For use in accordance with the statements, representations, and conditions in the LA dated October 24, 2006, and supplements dated December 13, 2006 (License Application and Request for Additional Information Responses); December 10, 2008; E-mail from R.E. Link titled "Compliance Plan" dated March 5, 2009; June 12, 2008, August 22, 2008, June 5, 2009, July 13, 2009, November 11, 2009, December 4, 2009, February 4, 2010, E-mail and Attachment Submitted by C.D. Manning on April 16, 2010, April 28, 2010; and E-mail and Attachment Submitted by C.D. Manning on July 1, 2010. Letters and LA dated February 14, 2011, October 8, 2010, August 24, 2011, February 13, 2012, April 19, 2013, May 7, 2014, September 23, 2014 (supplemented on December 10, 2014), and April 20, 2015.

Additionally, this safety condition was modified to include the date of AREVA's last application for amendment to license No. SNM-1227, dated May 7, 2014.

All other conditions of this license shall remain the same. Details on the safety evaluation associated with this review are provided below.

Environmental Safety

The regulatory basis for the environmental protection safety review is in 10 CFR 70.22, "Contents of Applications," and 10 CFR 70.65, "Additional Content of Application," and the basis for NRC approval are in 10 CFR 70.23(a) and 70.66(b). More specifically, the environmental protection review focuses on providing reasonable assurance of compliance with 10 CFR 70.22(a)(7) and (a)(8) and 10 CFR 70.65(b).

The NRC staff has reviewed the License Amendment Request (LAR) for the environmental impact due to an increase in UF₆ increased possession limit. As documented in the Safety Evaluation Report for the Renewal of SNM-1227, Richland Fuel Fabrication Facility, April 23, 2009 (ML090760702), the licensee has committed to adequate environmental protection measures, including (1) environmental and effluent monitoring and (2) effluent controls to maintain public doses ALARA as part of the radiation protection program. The increased interim storage does not translate into an increase in plant production throughput; introduces no new processes, waste streams, or environmental effluents; and can be fully accommodated on already-available UF₆ cylinder storage facilities.

The NRC staff concludes that the licensee's submittals satisfy the requirements of 10 CFR 70.22 and 10 CFR 70.65 on potential environmental hazards, consequences, and required controls for the requested U-235 possession limit increase. No changes are needed with respect to the site's current environmental programs. The staff review and analysis of the amendment request and supplemental information determined that the applicant demonstrated that the increased number of UF₆ cylinders in storage does not increase the likelihood or consequences of accidents as analyzed in the Integrated Safety Analysis (ISA). The NRC staff concludes that the applicant's conformance to the previously-approved environmental protection program is adequate to protect the environment and public health and safety and to comply with the regulatory requirements in 10 CFR Parts 20, " and Part 70.

Radiation Protection

The regulatory basis for the radiation protection review is in 10 CFR Part 20.1101, "Radiation Protection Programs."

The NRC staff has reviewed the licensee's submittal for the Radiation Protection (RP) due to an increase in UF₆ storage onsite. The regulatory requirements in 10 CFR 70.23(a)(3)-(4) require that the applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or property; and that the applicant's proposed procedures to protect health and to minimize danger to life or property are adequate. The storage of the additional quantity requested is a relatively small number of 30B cylinders. The additional storage will not result in environmental impact due to addition to an increase in waste stream or effluents. The material will not result in increased radiation exposures to AREVA staff or the public and will not require any change to facility or environmental monitoring programs.

The NRC staff concludes that the licensee's submittals satisfy the requirements of 10 CFR 70.23(a)(3)-(4).. The additional storage does not require any change to the Emergency Response Plans and does not require new processes or additional facilities to manage the material. The NRC staff review and analysis of the amendment request and supplemental information determined that the additional storage of the requested quantity of UF₆ as described in the LAR is acceptable.

Fire Protection

The regulatory basis for the fire safety review is in 10 CFR 70.22 and 10 CFR 70.65. In addition, the fire safety review focuses on providing reasonable assurance of compliance with 10 CFR 70.61, "Performance Requirements" and 70.62, "Safety Program and Integrated Safety Analysis."

This chapter addresses the staff's review of facility fire protection specific to the increase in U-235 possession limit, including fire safety management measures, fire hazards analysis, facility fire protection, process fire safety, and fire safety and emergency response, as presented in AREVA's request dated September 23, 2014. A teleconference was held between AREVA and NRC staff on February 10, 2015 (Ref. 3), which provided additional clarification on some fire safety aspects of AREVA's request.

Existing fire safety management measures, fire hazards analysis, facility fire protection, process fire safety, and fire safety and emergency response are utilized in AREVA's request. These existing facility fire protection features have been previously approved by the NRC for the protection of UF₆ cylinder storage areas. AREVA stated in its September 23, 2014, request that the increased storage of U-235 can be fully accommodated on already available UF₆ cylinder storage facilities. AREVA clarified this statement with the NRC staff on February 25, 2015, by stating that these storage facilities are existing, outdoor, asphalt/concrete storage pads that were built with a slope as a passive fire safety feature to prevent the pooling of flammable or combustible liquids beneath UF₆ cylinders.

AREVA's existing fire hazards analysis considered a fire in the UF₆ cylinder storage area which AREVA's addressed in the existing ISA [REDACTED] to meet the performance requirements in 10 CFR 70.61. AREVA stated on February 25, 2015, that [REDACTED] will remain applicable to all UF₆ cylinder storage areas. Furthermore, the management measures associated with these IROFS are unaffected by the requested U-235 possession limit increase.

AREVA's existing facility fire protection, process fire safety, and fire safety and emergency response continue to remain in place. The measures historically applied to AREVA's inventory of stored UF₆ will be applied in the same manner, including storage areas affected by the requested U-235 possession limit increase. The storage locations remain isolated from major plant facilities, offering little potential for interaction with undesirable events involving other onsite systems. The storage locations remain in low traffic areas and protected by barriers and/or bollards as appropriate. On-site vehicles remain limited to speeds of 10 mph. Full cylinders are transported and placed onsite via forklift using specially designed cylinder cradles or lifting beams as well as by overhead bridge cranes. Once placed into storage, a cylinder is typically not moved until it is either being brought in for processing or, in the case of interim storage for others, being reshipped offsite.

The NRC staff concludes that the licensee's submittals satisfy the requirements of 10 CFR 70.22 and 10 CFR 70.65 on potential fire hazards, consequences, and required controls for the requested U-235 possession limit increase. The staff review and analysis of the amendment request and supplemental information determined that the applicant demonstrated compliance with the performance requirements of 10 CFR 70.61 for fire protection related to postulated accident scenarios. The proposed modification does not adversely affect the effectiveness of NRC fire safety commitments, makes no changes to the NRC-approved fire safety bases, and is not in conflict with any existing fire safety license conditions. The staff finds the licensee has demonstrated the incorporation of appropriate fire safety considerations in the design and programs associated with the requested U-235 possession limit increase.

Material Control and Accountability

The regulatory basis for the material control and accounting (MC&A) review is in 10 CFR 70.32(c)(1)(iii). Specific MC&A requirements are in Subpart C of 10 CFR Part 74, specifically, 10 CFR 74.31, "Special Nuclear Material of Low Strategic Significance."

The NRC staff has reviewed the licensee's submittals for the MC&A program due to an increase in UF₆ storage onsite. The licensee stated that the changes in the domestic UF₆ supply, distribution, and storage within the industry, coupled with the need to accommodate its own UF₆ storage requirements, have generated a need for an increase in the U-235 possession limit for the Richland facility. Regarding the impact of this proposed increase on the MC&A program, the licensee states that the program as described in Richland's Fundamental Nuclear Material Control Plan (FNMCP) will not require modification. Furthermore, the licensee states that the required program elements for the receipt and shipment of UF₆ cylinders are in place. While the workload will increase, there will be no changes in methods or procedures regarding the handling of UF₆ cylinders. The licensee will continue to implement commitments as detailed in its currently approved FNMCP regarding receipt, storage, accounting, and control of the UF₆ its possession.

The NRC staff review confirmed that the LAR meets the requirements of 10 CFR 70.32(c)(1)(iii) in that the proposed increase to the possession limit does not decrease the effectiveness of the MC&A program or its measurement control program, implemented pursuant to Subpart C of 10 CFR Part 74.

Therefore, the NRC staff review and analysis of the amendment request and supplemental information determined that the proposed increase in U-235 is acceptable based upon the licensee's commitments detailed in the request:

- The request is limited to increased storage capacity of UF₆ cylinders;
- There will be no changes in the MC&A program; and
- There will be no changes in methods or procedures regarding the handling of UF₆ cylinders at the Richland facility.

The licensee will continue to receive, inspect, store, secure, and ship UF₆ cylinders in the same manner that UF₆ cylinders are handled today at the Richland facility. If any future modifications to the MC&A program are needed as a result of this request, they will be evaluated and submitted for review as appropriate.

Emergency Preparedness

The regulatory basis for emergency plan review are in 10 CFR 70.22(i)(1)(ii), 70.22(1)(3), 70.22(i)(4), and 70.23(a)(11).

The NRC staff has reviewed the licensee's submittals on the impact of the proposed increase in possession limit on the Emergency Program due to an increase in UF₆ possession limit and determined no impact to the program.

The NRC staff review and analysis of the amendment request and supplemental information confirmed that the AREVA Richland Facility Emergency Plan dated February 27, 2014, as approved by NRC staff in a letter dated June 16, 2014, is not affected by the proposed increase in the possession limit. The NRC staff concludes that no decrease in effectiveness would result from the proposed change as described in the LAR.

Decommissioning

The regulatory basis for decommissioning impact review are in 10 CFR 70.22(a)(9)

The NRC staff has reviewed the licensee's amendment request as well as the supplemental information for decommissioning impact (Ref. 2), due to an increase in UF₆ storage onsite. The supplemental information stated that AREVA seeks to increase current and future interim storage onsite of UF₆ 30-B cylinders and overpacks. The UF₆ storage is being provided for AREVA's own utility customers and for utility customers of other domestic fuel fabricators. As stated in the supplemental information, the material that is stored on behalf of AREVA's utility customers will not be owned by AREVA, the customers will retain title to the material. In the event AREVA enters decommissioning while utility owned feedstock is still onsite, AREVA stated the inventory of UF₆ will be reclaimed and removed by the utilities at no expense to AREVA.

The NRC staff review and analysis of the amendment request and supplemental information determined that the increase in possession limit is acceptable because the (1) proposed modifications will not increase the site's radioactive contamination footprint and will not increase the cost or complexity of the decommissioning effort at the time of license termination, (2) interim storage of material that is associated with AREVA's domestic utility customers introduces no new processes, waste streams, or environmental effluents, (3) customers will retain title to the material and will not be owned by AREVA, and (4) inventory of UF₆ will be reclaimed and removed by the utilities at no expense to the licensee in the event AREVA enters decommissioning while utility owned feedstock is still onsite.

Physical Security

The regulatory bases for physical security review are in 10 CFR 73.67.

The NRC staff reviewed the LAR for the physical protection program due to an increase in UF₆ storage onsite. The licensee stated that material will be stored in solid form in Model 30-B cylinders and that there will not be changes in processing operations. All the material will be stored within the existing controlled access areas. The licensee does not anticipate changes in security-related facilities, equipment, or practices and the Richland plant's physical protection program will not require modification.

The NRC staff review and analysis of the amendment request and supplemental information determined that from the physical protection standpoint, the proposed increase in the U-235 possession limit at the Richland facility will not adversely affect the previously approved Physical Security Plan and is acceptable as described in the LAR. No changes to the previously approved physical security plan are needed as a result of this increase in U-235 possession limit.

Nuclear Criticality Safety

The regulatory bases for nuclear criticality safety review are in 10 CFR 70.24(a) and 10 CFR 70.61.

The licensee's amendment request discussed the impact of the possession limit increase on several safety disciplines (Ref. 1), but did not address nuclear criticality safety (NCS). The staff subsequently reviewed the licensee's response to its RAI (Ref. 2) with regard to two potential impacts on NCS: (1) the effect on any expansion of the cylinder storage pads on its criticality alarm system coverage, and (2) the effect of the increase on criticality safety limits and controls. The staff followed up its review with a phone call on April 27, 2015.

The staff noted that the requested possession limit increase was to increase the capacity for storage of UF₆ cylinders. The licensee stated (Ref. 2) that the current NCS calculational basis bounds the increase in storage capacity. The increase affects only UF₆ cylinder storage and does not adversely affect the criticality safety basis or entail or changes to criticality controls for any other facility processes.

The licensee's RAI response (Ref. 2) described the location of its four current cylinder storage pads, which are shown in the submitted figure (Ref. 4). The licensee confirmed (Ref. 3) that UF₆ cylinder storage is analyzed based on assuming an infinite array of cylinders, so that the size of the storage array is not criticality significant. Nevertheless, the licensee stated (Ref. 3) that it does not anticipate any expansion to the existing four storage pads being needed, and confirmed that the storage pads added in 2013 and 2014 are not connected to the possession limit increase. The staff therefore concludes there is no impact of the increase on the existing criticality safety basis.

The licensee also confirmed that the existing UF₆ cylinder storage pads, and any new storage areas anticipated that might be needed in the future, will be covered by the existing criticality accident alarm system. To support this, the licensee referred to Figure 3-3 in the ISA Summary (Ref. 5) showing detector locations and coverage rays and circles overlaid over the facility plan diagram. The two figures show that there is a detector cluster in the scale house located within the traditional storage area, which is sufficient to cover three of the four cylinder storage areas.

The diagram (Ref. 5) also shows that the fourth cylinder storage area is within the detector coverage area of at least two other alarm clusters. Therefore, because the possession limit increase does not entail the expansion of the UF₆ cylinder storage pads, the staff concludes there is no impact on criticality alarm coverage. Should additional cylinder storage areas be required in the future, either as the result of the increase or for other reasons, they would be evaluated for coverage under the licensee's existing program and additional detectors put in place as needed.

The staff review and analysis of the amendment request determined that the possession limit increase does not affect either the criticality safety basis or criticality alarm coverage for the facility. The current analysis and controls, and current detector coverage areas, adequately bound any planned increase in possession limit.

ENVIRONMENTAL REVIEW

Amendment of SNM-1227 authorizing an increase in the licensed possession limit belongs to a category of actions that the Commission has declared to be a categorical exclusion, after first finding that the category of actions does not individually or cumulatively have a significant effect on the human environment, in accordance with 10 CFR 51.22. As documented in the safety review above, the amendment authorizes a change in process operations that will result in (i) no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, (ii) no significant increase in individual or cumulative occupational radiation exposure, (iii) no significant construction impact, and (iv) no significant increase in the potential for or consequences from radiological accidents. Therefore, as authorized by 10 CFR 51.22(c)(11), neither an environmental impact statement nor an environmental assessment has been prepared for this amendment.

CONCLUSION

As described in the licensee's submittals, the increased in UF₆ possession limit will no increase Richland's fleet of Model 30-B cylinders. In addition, AREVA indicated that the increased interim cold storage of UF₆ 30-B cylinders do not translate into an increase in plant production throughput; introduces no new processes, waste streams, or environmental effluents; and can be fully accommodated on existing UF₆ cylinder storage facilities. Based on the review and evaluation of the licensee's submittal, the NRC staff determined that the request to increase the facility's possession limit from [REDACTED], to allow AREVA to provide interim UF₆ storage, satisfy the appropriate regulations and provides reasonable assurance that the health and safety of the public will be protected. Therefore, the commitments in the License Application continue to ensure effective programs at the AREVA facility. The NRC staff approves the amendment request.

REFERENCES

1. Application for Increased U-235 Possession Limit for the AREVA Inc. Richland Fuel Fabrication Facility; License No. SNM-1227; Docket No. 70-1257 (Public: ML14324A726 and Non-Public: ML14276A273).
2. Supplemental Information Relative to Decommissioning Impact of Requested Possession Limit Increase; AREVA Inc. Richland Fuel Fabrication Facility; License No. SNM-1227; Docket 70-1257 (Non-Public: ML14345B026)
3. Meeting Summary of February 10, 2015, Conference Call to Discuss AREVA'S Amendment Request to Increase U-235 Possession Limits (Public: ML15050A515)
4. Request for Additional Information-AREVA Possession Limit Increase dated April 13, 2015 (Public: ML15104A184).
5. Response to Request for Additional Information-AREVA Possession Limit Increase dated April 20, 2015 (ML15126A096).
6. Meeting Summary of April 27, 2015, Conference Call to Discuss AREVA's Amendment Request to Increase U-235 Possession Limits (Non-Public: ML15120A022).
7. Drawing CSA-607, 590, "Horn Rapids Road Site General Arrangement," Rev. 48.
8. Drawings EMF-609, 504, "Criticality Alarm System Monitor Coverage," from ISA Summary.

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