



May 7, 2020  
ACO 20-0013

ATTN: Document Control Desk  
Mr. John W. Lubinski, Director  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**American Centrifuge Plant; Docket Number 70-7004; License Number SNM-2011**

**License Amendment Request for American Centrifuge Operating, LLC's License Application and Supporting Documents for the American Centrifuge Plant**

**INFORMATION TRANSMITTED HEREWITH IS PROTECTED FROM PUBLIC DISCLOSURE AS CONFIDENTIAL COMMERCIAL OR FINANCIAL INFORMATION AND/OR TRADE SECRETS PURSUANT TO 10 CFR 2.390 AND 9.17(a)(4)**  
**AND**  
**INFORMATION TRANSMITTED HEREWITH IS PROTECTED FROM DISCLOSURE PURSUANT TO 10 CFR PART 810**

Dear Mr. Lubinski:

As discussed in Reference 1, to support the U.S. Nuclear Regulatory Commission's (NRC) in-process review and approval of the proposed amendment for American Centrifuge Operating, LLC's (ACO) License Application and Supporting Documents for the American Centrifuge Plant (ACP) in Piketon, Ohio (Materials License SNM-2011), this letter provides additional proposed changes to the Environmental Report and the Fundamental Nuclear Material Control Plan.

Enclosure 1 provides a detailed description, justification, and ACO's significance determination for the proposed changes to the following documents:

- Enclosure 2 provides proposed changes to LA-3605-0002, *Environmental Report for the American Centrifuge Plant*
- Enclosure 3 provides proposed changes to NR-3605-0005, *Fundamental Nuclear Material Control Plan for the American Centrifuge Plant*.
- Enclosure 4 provides a new document NR-3605-0005B, *Addendum 1 of the Fundamental Nuclear Material Control Plan for the American Centrifuge Plant - HALEU Demonstration*.

Document/matter transmitted contains ~~Security - Related Information - Withhold Under 10 CFR 2.390~~  
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When separated from enclosures, this cover letter is uncontrolled.

NM552D

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Mr. John W. Lubinski  
May 7, 2020  
ACO 20-0013, Page 2

Proposed changes from the previously NRC-approved documents are noted with revision bars in the right-hand margin. Based upon the 10 Code of Federal Regulations (CFR) 70.32 and 70.72 evaluations, not all proposed changes depicted warrant the NRC's review and approval; however, are provided for completeness to assist in the review efforts.

A corresponding new document NR-3605-0005C, *(U) Program for Precluding and Detecting Unauthorized Production/Enrichment and Diversion Activities for the HALEU Demonstration Centrifuge Facility*, will be submitted under separate cover, ACO 20-0014, for the NRC's review as part of this License Amendment Request.

Enclosures 3 and 4 contain Proprietary and Security-Related Information. Also, in accordance with the guidance provided by the U.S. Department of Energy (DOE), Enclosures 3 and 4 also contain Official Use Only information. Therefore, ACO requests these enclosures be withheld from public disclosure pursuant to 10 CFR 2.390(d)(1). Enclosures 3 and 4 have been determined, in accordance with the guidance provided by the DOE, to contain Export Controlled Information and must be protected from disclosure per the requirements of 10 CFR Part 810.

After the NRC staff has had an opportunity to review the enclosures, ACO is available to support a discussion with the NRC to address questions or clarify issues. Implementing documents are available at the site for inspection. ACO respectfully requests NRC complete their review and final approval on or before June 2, 2021 to support the ongoing schedule for the HALEU Demonstration Program.

If you have any questions regarding this submittal, please contact me at (740) 897-3859.

Sincerely,



Kelly L. Wiehle  
Regulatory Manager

Enclosures: As stated

~~Security – Related Information – Withhold Under 10 CFR 2.390~~  
~~Export Controlled Information, Official Use Only, and Proprietary Information~~

Mr. John W. Lubinski  
May 7, 2020  
ACO 20-0013, Page 3

Reference:

1. ACO 20-0010 from K. Wiehle to J. Lubinski (NRC) regarding License Amendment Request for American Centrifuge Operating, LLC's License Application and Supporting Documents for the American Centrifuge Plant, dated April 22, 2020

cc (without enclosures, unless otherwise noted):

M. Bartlett, NRC HQ (Enclosures)  
Y. Faraz, NRC HQ (Enclosures)  
S. Harlow, DOE HQ  
J. Hutson, Pro2Serve (CONTR), NE-ORSO  
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T. Vukovinsky, NRC Region II



## Detailed Description, Justification, and Significance Determination

### Detailed Description of Change

On April 22, 2020 (ACO 20-0010), American Centrifuge Operating, LLC (ACO) submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) for prior review and approval. Specifically, proposed changes to the Possession Limits provided in Chapter 1.0 of the License Application were provided to allow for the operation of a 16-centrifuge high-assay, low-enriched uranium (HALEU) demonstration cascade during this U.S. Department of Energy (DOE) three-year contract period (expiring May 31, 2022). One of the remaining supporting documents impacted most by those proposed changes was NR-3605-0005, *Fundamental Nuclear Material Control Plan (FNMCP) for the American Centrifuge Plant*.

The FNMCP (NR-3605-0005) has since been revised in support of this license amendment request. As referenced within the proposed changes to Section 1.1 of NR-3605-0005, a new document NR-3605-0005B, *Addendum 1 of the Fundamental Nuclear Material Control Plan for the American Centrifuge Plant – HALEU Demonstration*, was created and describes the information unique to the program used to control and account for nuclear materials for HALEU Demonstration. The objective of the HALEU Demonstration Program is to demonstrate the capability to produce UF<sub>6</sub> product enriched up 19.75 weight (wt.) percent <sup>235</sup>U using existing technology. Enrichment levels up to 25 wt. percent <sup>235</sup>U are authorized to permit for process fluctuations which can create small amounts of higher weight percent material. The process configuration for the HALEU Demonstration is similar to the total process configuration of the ACP, with the exception that it will be limited to a maximum of 16 operating centrifuges. For HALEU Demonstration, ACO possesses and is responsible for control and accountability of Special Nuclear Material (SNM) of moderate strategic significance as defined in 10 *Code of Federal Regulations* (CFR) 70.4. New document NR-3605-0005B satisfies the requirements contained in 10 CFR 74.41, *Nuclear material control and accounting for special nuclear material of moderate strategic significance*. Also, as part of NR-3605-0005B, Section 11.0 refers the reader to Appendix A for a new document NR-3605-0005C, *(U) Program for Precluding and Detecting Unauthorized Production/Enrichment and Diversion Activities for the HALEU Demonstration Centrifuge Facility*. This new, classified appendix describes the site program for protecting against and/or detecting unauthorized diversion of enriched uranium and is being submitted under separate cover, ACO 20-0014, for the NRC's review as part of this license amendment request.

Additionally, to support this overall license amendment request, LA-3605-0002, *Environmental Report for the American Centrifuge Plant*, has since been revised to evaluate the operation of a 16-centrifuge HALEU demonstration cascade as the proposed first modular deployment of the ACP. Previously estimated data within the original Environmental Report is being updated with actual operational data wherever possible, and provides environmental changes resulting from operational experience.

ACO respectfully requests NRC complete their review and final approval on or before June 2, 2021 to support the 3-year schedule of the HALEU Demonstration Program. ACO is currently in the process of transitioning programs, procedures, and documents over to the ACP, which will support the inspections required by 10 CFR 70.32(k). The anticipated NRC Operational Readiness Review process is requested to begin in July 2021 with final approval to introduce gas requested by September 7, 2021. Following NRC's approval to introduce gas for the HALEU Demonstration Program, ACO intends to request termination of NRC Materials License SNM-7003 for the Lead Cascade Facility.

Corrections, clarifications, grammatical, and administrative/editorial changes were made throughout LA-3605-0002 and NR-3605-0005. Based upon the 10 CFR 70.32 and 70.72 evaluations performed, not all proposed changes depicted within the enclosures warrant the NRC's review and approval; however, are provided for completeness to assist in the review efforts. The proposed changes contained within Enclosures 2 and 3 are identified by the following method:

- Blue Strikeout - Identifies text to be removed
- Red underline - Identifies text to be added

### **Justification**

On May 31, 2019, ACO and the DOE entered into a letter contract and on October 31, 2019, ACO signed a three-year contract with the DOE to deploy a cascade of centrifuges to demonstrate production of HALEU fuel for advanced reactors. The two primary objectives of the HALEU Demonstration Program are for ACO to deploy a 16-machine AC-100M HALEU cascade to produce 19.75% <sup>235</sup>U enriched product and to demonstrate the capability to produce HALEU utilizing U.S.-origin uranium enrichment technology. Work under the contract includes licensing, construction, assembling, and operating AC-100M centrifuges and related infrastructure in a cascade formation to produce HALEU at the ACP in Piketon, Ohio.

To support the HALEU program, existing NRC-approved Lead Cascade programs are currently being used to support the design, assembly, and construction efforts; and will be transitioned and subsumed into the ACP. As a result, ACO is amending the ACP license and prepared a license amendment request for the NRC's prior review and approval to allow HALEU production to begin in the fourth quarter of 2021.

Proposed changes to LA-3605-0002 meet the requirements of 10 CFR 51.60, that defines the requirements for submitting a NRC materials license amendment. The proposed phased deployment of the ACP environmental impacts are bound by the previously NRC-approved NUREG-1834, *Environmental Impact Statement for the Proposed American Centrifuge Plant in Piketon, Ohio* (April 2006), which evaluated the potential environmental impacts of the proposed action and reasonable alternatives for the construction, operation, and decommissioning of a uranium enrichment facility to produce up to 7 million separative work units per year. Construction of the HALEU Demonstration cascade will be within existing buildings recently utilized for the American

Centrifuge Lead Cascade Facility and with no outside ground disturbances for additional facilities to be built to support this initial deployment phase.

None of the proposed changes contained within this license amendment request contradict any part of the proposed changes submitted under ACO 20-0010 to the operations/function descriptions or accident scenarios as previously described in the Integrated Safety Analysis (ISA) Summary or Addendum 1 of the ISA Summary – HALEU Demonstration. Therefore, the proposed changes contained within this license amendment request will not alter the design or performance of an item or activity as previously described and submitted within the ISA Summary or Addendum 1 of the ISA Summary – HALEU Demonstration.

In accordance with 10 CFR 70.32, 70.34, and 70.72, the proposed changes contained within this license amendment request discussed above, require the NRC's prior review and approval. The proposed changes will not decrease the ability of the management measures in the License Application to ensure the availability and reliability of items relied on for safety (IROFS). The proposed changes and new document do not decrease the effectiveness of the design basis as described in the License Application. Lastly, the proposed changes do not have an adverse effect on compliance with applicable regulatory requirements.

### **Significance Determination for Proposed Conforming Changes**

ACO has reviewed the proposed changes and provides the following Significance Determination.

**1. No significant change to any conditions to the License.**

The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program are not prohibited by 10 CFR Part 70, license condition, or order.

**2. No significant increase in the probability of occurrence or consequences of previously evaluated accidents.**

The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program do not remove, without at least an equivalent replacement of the safety function, an IROFS that is listed in the ISA Summary and Addendum 1 of the ISA Summary – HALEU Demonstration. The proposed changes do not alter any IROFS listed in the ISA Summary or Addendum 1 of the ISA Summary – HALEU Demonstration, that is the sole item preventing or mitigating an accident sequence that exceeds the performance requirements of 10 CFR 70.61.

**3. No new or different type of accident.**

The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program do not create new types of accident sequences that, unless mitigated or prevented, would exceed the performance requirements of 10 CFR 70.61 and that have not previously been described in the ISA Summary and Addendum 1 of the ISA Summary

– HALEU Demonstration. All new or modified accident sequences for HALEU demonstration are the same types of sequences previously analyzed.

**4. No significant reduction in the margins of safety.**

The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program do not decrease the margin of safety associated with any IROFS being credited to ensure the performance requirements of 10 CFR 70.61 are met.

**5. No significant decrease in the effectiveness of any programs or plans contained in the licensing documents.**

- The HALEU Demonstration Program requires the possession of classified matter up to Secret-Restricted Data to operate. Therefore, in accordance with 10 CFR Part 95, *Facility Security Clearance and Safeguarding of National Security information and Restricted Data*, SP-3605-0041, *Security Plan for the Protection of Classified Matter at the American Centrifuge Plant*, was previously submitted on March 31, 2020 (ACO 20-0009) to the NRC for prior review and approval. Final approval will allow for a revised Facility Data and Approval Record be provided for Facility Code 8759, American Centrifuge Operating, LLC, to formally change the Importance Rating to Possessing and allow the introduction of classified matter for use. The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program will not decrease the overall level of security performance needed to protect against the loss or compromise of classified matter, while in use, in storage, or in transit. The control of classified storage areas or vaults, training of classifiers, and documentation of classification of matter will be maintained at an equivalent level. New security plans SP-3605-0039 and SEC-18-0002 provide for the protection of cyber systems, maintaining the necessary computer security requirements at an equivalent level as previously approved by the NRC.

Additionally, in accordance with the requirements of 10 CFR Part 73, *Physical Protection of Plants and Materials*, SP-3605-0042, *(U) Security Plan for the Physical Protection of Special Nuclear Materials at the American Centrifuge Plant*, is under development in support of this license amendment request and will be provided to the NRC for prior review and approval in a subsequent submittal.

- The proposed changes provided within this license amendment request will have no effect on the FNMCP meeting the applicable requirements of 10 CFR Parts 70 or 74 for ACP.
- The proposed changes provided within the license amendment request to implement the HALEU Demonstration Program do not result in a decrease in effectiveness of the approved ACP Emergency Plan. For HALEU demonstration, no Emergency Plan as discussed under 10 CFR 70.22(i) is required. Likewise, the proposed changes will not decrease the abilities of the DOE reservation Responses Organization to mitigate accident consequences or reasonably assure the adequate protection of the health and safety of the off-site and on-site personnel in the event of an emergency.



- Proposed changes were previously made to the Quality Assurance Program Description to update program elements from the ASME standard NQA-1, Quality Assurance Requirements for Nuclear Facility Applications, 1994 edition to the 2008 edition with the NQA-1a-2009 addenda. Those proposed changes did not represent a relaxation of a requirement of Quality Assurance Program Description.

Based on the above, the proposed changes to implement the HALEU Demonstration Program will not result in a decrease in the effectiveness of the Security Programs/Plans, FNMCP, Emergency Plan, or the Quality Assurance Program Description contained in the licensing documents.

- 6. The proposed change does not result in undue risk to: 1) public health and safety; 2) common defense and security; and 3) the environment.**

The proposed changes provided within this license amendment request do not involve significant quantities of licensed material due to the three-year DOE HALEU Demonstration Contract period and do not change the response to accidents or events associated with licensed material. There will be no generation or increase in hazardous material quantities such that it impacts public health and safety. The proposed changes will not impact the plant boundary protection, documentation or performance of security patrols, or training of protective force personnel. The proposed changes will not increase the likelihood classified matter or SNM will be accessible to unauthorized personnel since the protection requirements are comparable with those previously NRC-approved for use under the Lead Cascade operations and decommissioning activities previously handled by the *Security Program for the American Centrifuge Plant* and *Transportation Security Plan for Classified Matter Shipments for the American Centrifuge Plant*. Therefore, the proposed changes do not result in undue risk to public health and safety, the environment, or to the common defense and security.

- 7. There is no change in the type or significant increases in the amounts of any effluents that may be released off-site.**

The proposed changes provided within this license amendment request to implement the HALEU Demonstration Program do not result in any new or unusual sources of hazardous substances, hazardous waste, or new waste streams that could be generated or used in unacceptable levels that exceed applicable regulatory requirements as a result of the proposed changes. In addition, there is no change in the type or significant increases in the amounts of any effluents that may be released off-site.

- 8. There is no significant increase in individual or cumulative occupational radiation exposure.**

DAC-3901-0005, *Evaluation of No Need for an Emergency Plan for the HALEU Demonstration*, provides the evaluation stipulated in 10 CFR 70.22(i)(1)(i) to demonstrate that no Emergency Plan is required for the HALEU Demonstration Program. The evaluation shows that the maximum dose to a member of the public offsite due to a release of radioactive materials would not exceed 1 rem effective dose equivalent or an intake of 2 mg of soluble U. Therefore, the

proposed changes provided within this License Amendment Request to implement the HALEU Demonstration Program will not increase radiological or chemical releases beyond applicable regulatory limits (10 CFR 70.61) and will not create any new or unusual sources of radioactive waste. Likewise, the proposed changes will not result in significant increase in individual or cumulative occupational radiation exposure.

**9. There is no significant construction impact.**

HALEU Demonstration Program construction activities are currently underway supporting the security upgrades needed to support the NRC's Operational Readiness Review inspections required to issue a Possessing Facility Security Clearance in the fourth quarter of 2020. Previously submitted SP-3605-0018 (ACO 20-0009, dated March 31, 2020) establishes the temporary security plan needed to support unclassified construction activities within the Controlled Access Area of the ACP. Currently, there are no foreseen environmental concerns based upon the fact that the HALEU Demonstration Program is being constructed within leased buildings used for the previous American Centrifuge Lead Cascade Facility operations; however, on a much smaller scale. There will be no new building construction planned for this initial deployment phase of the ACP.