



26-October 2021  
Project Number: 99902080

US Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

**SUBJECT: SUPPLEMENT SUBMITTAL TO THE PRINCIPAL DESIGN CRITERIA FOR ATOMIC ALCHEMY'S NON-POWER PRODUCTION AND UTILIZATION FACILITY**

**REFERENCES:** 1) Atomic Alchemy Inc. Letter AAL-2020-004, "Principal Design Criteria for Atomic Alchemy's Non-Power Production and Utilization Facility" Agencywide Documents Access and Management System (ADAMS) Accession No. ML21169A044, dated June 18, 2021.

2) NRC, "Topical Report Completion Determination" ADAMS Accession No. ML1201A196, dated August 31, 2021.

**ENCLOSURES:** 1) Atomic Alchemy's Response to the NRC's Additional Information Needed (AIN) Items 1-3.

2) AA0-VIPR-21-PDC-01(NP), Atomic Alchemy Principal Design Criteria for the Atomic Alchemy Facility, Rev. 1.

In NRC ADAMS Accession No. ML21169A044 (Reference 1), Atomic Alchemy submitted Revision 0 of the subject Topical Report (TR) for the Nuclear Regulatory Commission (NRC) review on June 18, 2021. In NRC ADAMS Accession No. ML1201A196, "Topical Report Completion Determination" (Reference 2) dated August 31, 2021, the staff stated that additional information was necessary in order to accept the Topical Report for the Staff's review.

The purpose of this letter is to submit a response (Enclosure 1) to the three (3) NRC Additional Information Needed (AIN) items (in Reference 2) and to submit Atomic Alchemy's Principal Design Criteria (PDC) Topical Report Revision 1, (Enclosure 2) for NRC review and approval.

The AA0-VIPR-21-PDC-01(NP) Revision 1 is submitted in support of the preparation of Atomic Alchemy's Non-power Production Utilization Facility (NPUF) construction permit application and operating license application, under Title 10 Code of Federal Regulations (CFR) Part 50.

In order to help increase the efficiency of the licensing process, Atomic Alchemy discussed the concept of this supplement submittal to its principal design criteria with the NRC staff during conference calls on September 1st, 2021, and October 8<sup>th</sup>, 2021.

There are no commitments made in this submittal.

Atomic Alchemy is requesting the review and approval for the proposed PDC. Atomic Alchemy's expectations of the scope of the NRC review and approval are further defined as follows:

- I. A determination by the Staff that the submitted Atomic Alchemy's principal design criteria meets the underlying purpose and technical rationale (subject to any limitations in an SE) for the applicable NPUF requirements of 10 CFR 70.64 Baseline Design Criteria (BDC) and for the applicable NPUF requirements of 10 CFR 50.34(a)(3)(i) for PDC.
- II. A determination by the Staff that the Atomic Alchemy's development methodology of deriving its principal design criteria by adopting specific GDC along with modifying some of the Part 50 GDC language and expanding or narrowing its respective scope (as justified in the TR) acceptable for establishing the PDC requirements for its NPUF.
  - a. A further concurrence (or variance) by the staff to the regulatory GAP analysis component of the GDC evaluation and departures that were included as part of the PDC development.
- III. The NRC finds that the Atomic Alchemy's principal design criteria establish the necessary design, fabrication, construction, testing and performance requirements for its safety related structures, systems, and components to provide reasonable assurance the Atomic Alchemy NPUF can be operated without undue risk to the health and safety of the public.

If there are any questions or a need for additional information, please contact Mr. Michael Grochowski at [regulatory@atomicalchemy.us](mailto:regulatory@atomicalchemy.us).

Sincerely,

Thomas Eiden  
CEO, Atomic Alchemy Inc.

TE/mjg

CC:

Nuclear Regulatory Commission:

**Michael Balazik**, Project Manager

Non-Power Production and Utilization Facilities Licensing Branch

Division of Advanced Reactors and Non-Power Production and Utilization Facilities (NPUFs)

Office of Nuclear Reactor Regulation

**Greg Casto**, Branch Chief

Non-Power Production and Utilization Facilities Licensing Branch

Division of Advanced Reactors and Non-Power Production and Utilization Facilities (NPUFs)

Office of Nuclear Reactor Regulation

Atomic Alchemy Inc.

**Michael Grochowski**, Nuclear Regulatory Affairs & Compliance Manager