

ARC/NRC-PM-007

Docket No. 99902103

September 2, 2024

United States Nuclear Regulatory Commission (NRC)
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: ARC Clean Technology, Inc. (ARC)
Revision 5 of the ARC-100 Regulatory Engagement Plan (REP)

Reference: ARC/NRC-PM-004 dated April 27, 2023

The reference letter transmitted the latest revision to the ARC-100 Regulatory Engagement Plan (REP). The REP was provided for NRC staff information and outlines plans for interactions with the NRC during pre-licensing activities associated with the ARC-100 Sodium-Cooled Fast Reactor, and that particular Revision 4 of the REP included Enclosure 1, with the proposed schedule for submittal of the white papers and technical and topical reports identified to the date of that transmittal.

During the meetings held on April 12, 2023, ARC committed to revising the REP every time additional papers or reports may be planned and scheduled. There were no changes until the preparation for and after the March 28, 2024 meeting. With profound apologies for not having sent an updated REP in the April 2024 time frame (prepared but never sent), this letter provides an updated version of the REP Enclosure 1, with revisions of the topics that have been covered, and will be further covered at the November 2024 meeting, tentatively scheduled in the period of Nov 11 -14; and also, the April 2025 meeting. Additionally, the updated version of REP Enclosure 1 provides the status of the already committed white papers and technical reports, and a proposed schedule for submittal of the additional white papers and technical reports identified to the end of the present DOE contract.

If you have any questions or need any additional information, please contact me at riotti@arc-cleantech.com or (732) 890-3602 or Raymond Burski, ARC 100 Licensing Director rburski@arc-cleantech.com or (504) 909-6436.

A handwritten signature in black ink, appearing to read "Robert Iotti", with a stylized flourish at the end.

Sincerely,
Robert Iotti
ARC 100 Project Manager ARC
Clean Technology

Enclosure:
ARC-100 Regulatory Engagement –Meeting Dates and proposed White Papers and Technical/Topical Reports with proposed scheduled dates

cc (w/enclosure):

Stephanie Devlin-Gill, Senior Project Manager, NRR/DANU/UAR1

Donna Williams, Senior Project Manager, NRR/DANU/UAR1

William Jessup, Chief, NRR/DANU/UAR1

Stephen Philpot, Acting Chief, NRR/DANU/UAL2

Kaatrin Abbott, DOE Program & Project Manager

Enclosure 1 (Revised **in Red**)

A. Regulatory Engagement - Revised Content and Proposed Meeting Dates

Meeting** dates and Information material [in brackets] made available to the NRC approximately 30 **but no later than 10 days** before the meetings].

1st Meeting April 12 2023

Quality Program, Design Approach, Project Execution *ARC Quality Assurance Program Description, Project Execution Plan*

SSC Classification [*ARC Structures, Systems and Components Classification Approach and Report*]

White Paper on SSC classification as RTNSS **submitted on April 4, 2023**

Fuel [*Fuel Qualification Program Plan; Fuel System Design Description Document (SDD)*]

White paper on Fuel Qualification program submitted on Sept 4, 2023

Core [*Core SDD*]

Reactor Vessel, Guard Vessel, and Internals [*RVDV SDD*]

Primary System [*Primary Heat Transport SDD*],

Reactivity Control [*Reactivity Control and Drive system SDD*]

Heat Removal Systems [*Direct Reactor Auxiliary Cooling System (DRACS); Reactor Vessel Auxiliary Cooling System (RVACS) SDD*]

R&D Management Program [*Same name report*] **The report has now been revised, named “Program Plan for Future Tests”, and will be provided in support of the 4th meeting**

2nd Meeting November 2023

Fuel Handling Systems and Safeguards [*Fuel Handling Systems SDD*]

White paper on In -Vessel Fuel Storage submitted on June 23, 2023

Instrumentation and Control (Reactor Protection Systems) [*I&C SDD*]

Electrical [*Electrical SDD; EM Pumps Variable Frequency Drives; Pump Coast down provisions technical report*]

~~Power Conversion System [*Power Conversion System SDD*]~~ **Postponed to 5th meeting**

~~Purification Systems [*Primary and Intermediate sodium purification SDD; Cover gas purification SDD*]~~

3rd Meeting April 2024

Probabilistic Safety Analysis [*Technical Information Report Partial report PSA Part 1 sent on 4/22/2024*]

Deterministic Safety Analyses [*Updated Technical Information Report sent on 3/22/2024*]

Functional Containment [*Technical Information Report- Report sent on 3/22/2024*]

4th Meeting November 2024

Structures

Seismic Isolation [*Technical Information Report*]

~~Aircraft Impact~~ (*eliminated because of insufficient information to provide meaningful input to the NRC*)

Flexibility to operate ARC-100 at 200MWe (545MWth) [*Technical Information Report*]

Other systems and structures

Fire protection [*Fire Protection SDD*]

HVAC [*Safety and non-Safety HVAC SDD*]

Security [*Safeguards and Security SDD*]

Water Systems [*Various SDDs*]

R&D Activities

Technical Information Report on Flow Blockage

Technical Information Report on Power Reactivity Decrement (~~precomputed shapes~~)

Justification for no Alternate Shutdown System [*Technical Information Report may not be available till 12/22/2024*]

Updated R&D Program [*Technical Information Report now named Program Plan for Future Tests*]

5th Meeting April 2025

Power Conversion System [*Power Conversion System SDD*]

Purification Systems [*Primary and Intermediate sodium purification SDD; Cover gas purification SDD*]

Decommissioning [*Technical Information Report*]

Update on prior meeting

NRC Preliminary Conclusions

****Propose all meetings via Video with the possible exception of an informal last meeting to be schedule after June 2025**

B. Proposed Schedule of White Papers (WP) and Technical Reports (TCR) ~~and Topical (TPR) Reports~~

| Type | Topic | Initial Submittal Date | Actual/Projected Submittal Date | NRC Response Received | Notes and Explanations |
|----------------|---|------------------------|---------------------------------|---|---|
| WP | RTNSS Classification | N/A | April 4,2023 | 9/22/2023 (EPID NO. L-2023-LRO-0024) | |
| WP | Spent fuel storage in main reactor vessel (safety, security and safeguards advantages) | 6/30/2023 | June 23,2023 | 1/12/2024 (EPID NO.L-2023-LRO-0054) | |
| WP | Fuel Qualification by Design and First of a Kind (FOAK) Confirmation Program | 9/4/2023 | 10/12/2023 | 8/19/2024 (EPID NO.L-2023-LRO-0071) | |
| TCR | Variable Frequency Drives and Safety Related Coast-down of Primary Pumps | 9/4/2023 | 10/10/2023 | N/A | Also submitted Electrical system description addressing pump coast down (same date) |
| TCR | Power Reactivity Decrement use to predict core potential abnormalities and deformations | 3/15/2024 | 11/1/2024 | N/A | Report is already available. Will provide before 11/1/2024 |
| TCR | Technical Report on Functional Containment (Containment vs. Confinement) | 3/15/2024 | 3/22/2024 | N/A | Changed from topical to technical report. Topical will be submitted for specific (non -generic) site |
| WP | Topical Report on Alternate Shutdown (Not Rods) System | 5/15/2024 | 12/22/2024 | | Report converted to White paper |
| TCR | Probabilistic Safety Assessment and Reactor Protection System Simplification | 6/15/2024 | 12/22/2024 | N/A | Portion of this paper is also used to justify why alternate (not-rods) shutdown systems should not be required and is included in WP above |
| TCR | Flow blockage consequences- extent of propagation | 10/1/2024 | 11/1/2024 | N/A | |
| TCR | Technical Report on Use of Seismic Isolators | 9/1/2024 | 11/1/2024 | N/A | Initially planned topical would lack information that cannot be developed until later in time |
| TCR | Flexibility to Operate at 200 MWe | 2/15/2025 | 11/1/2024 | N/A | |
| TCR | Research and Development Program | 2/15/2025 | 11/1/2024 | N/A | |