



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 3, 2020

MEMORANDUM TO: Benjamin G. Beasley, Chief
Advanced Reactor Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

FROM: Jan M. Mazza, Project Manager */RA/*
Advanced Reactor Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF AUGUST 4-5, 2020, MEETING BETWEEN THE
U.S. NUCLEAR REGULATORY COMMISSION STAFF AND
OKLO POWER, LLC, TO DISCUSS MAXIMUM CREDIBLE
ACCIDENT AND CLASSIFICATION OF STRUCTURES
SYSTEMS AND COMPONENTS (EPID L-2020-NEW-0004)

A virtual Category 1 public meeting was held on August 4-5, 2020, between the U.S. Nuclear Regulatory Commission (NRC) staff and representatives from Oklo Power, LLC (Oklo) using the Microsoft Teams platform. The purpose of the meeting was for NRC staff to discuss questions with Oklo on the maximum credible accident (MCA), and classification of structures, systems, and components (SSCs) provided in the Oklo Aurora combined license (COL) application. The meeting also provided Oklo an opportunity to present their process for developing the MCA and classification of SSCs.

Day 1 August 4, 2020

The meeting commenced with an NRC staff presentation titled, "Public Meeting Maximum Credible Accident Concept and Discussion." The presentation identified three current methods for developing the licensing basis including the traditional deterministic approach, the maximum hypothetical accident (MHA) approach as described in NUREG-1537; and the Licensing Modernization Project (LMP) approach as described in Nuclear Energy Institute (NEI) 18-04 and Regulatory Guide (RG) 1.233. The concept of defense in depth was also described as part of the consideration for prevention and mitigation over a spectrum of operational scenarios. The NRC staff considers the approach that Oklo used to develop their MCA reasonable; however, additional information is needed on the application of the approach.

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The NRC staff presentation described the areas in the Oklo COL application where additional analysis and information is needed to make a safety finding. The NRC staff was seeking information on the event screening process and provided the following examples of events and topics that need additional information:

- The potential for a heat pipe failure with a failure to trip
- Dynamic effects associated with high energy rupture (secondary fluid) inside the module
- Additional justification is needed for not considering a cell can failure or leak over the life of the plant, and not having provisions for sampling/detection to ensure this assumption is valid
- Additional justification is needed for assumptions used to arrive at the proposed MCA, which rely on application of historical data and component usage that may not apply directly or be well-established for the usage case in the Oklo design
- Additional information is needed for components that could provide a potential path to the environment
- External events and internal flooding and their effects on the safety of the reactor

The NRC staff also discussed Oklo's MCA approach that provides for zero dose consequences. The NRC staff noted that this conclusion needs further discussions as it impacts the NRC staff review and findings in a number of areas in the application (security, environmental, emergency planning, SSC classification, etc.).

Oklo provided a presentation that described their method for developing the MCA. The presentation contained information that is consistent with the content of the Aurora COL application. The presentation also highlighted additional considerations, beyond those stated in the FSAR, that were involved in the identification of the MCA (e.g., heat pipe reactors considered, and heat pipe reactor events).

The NRC staff provided an opportunity for members of the public to ask the NRC staff questions or make comments. Questions and comments were provided by:

- Ed Lyman, Union of Concerned Scientists
- Ben DeNardo
- Eric Meyer
- Sarah Fields
- Travis Chapman of X-Energy

Day 2 August 5, 2020

The meeting commenced with an NRC staff presentation titled, "Public Meeting Safety Classification of Structures Systems and Components." The purpose of this presentation was for the NRC staff to gain an understanding of Oklo's SSC classification with the ultimate goal to assure that SSCs are designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. The presentation outlined the two established schemes related to safety classification of SSCs which were the definitions in Title 10 of the *Code of Federal Regulations* (10 CFR) Parts 50.2 and 100.3, and the definitions in RG 1.233 and NEI 18-04. The NRC staff noted that further discussion is necessary to understand Oklo's classification of SSCs including the shutdown rods, the reactor trip system, other SSCs related to heat removal and retention of radionuclides, and the building

structure. The presentation concluded with a summary of items for which the NRC staff needs additional information. These were:

- The role of quality assurance program and related consensus codes and standards (e.g., NQA-1) for SSCs used in fulfilling safety functions
- General use of consensus codes and standards or other common references to help define materials, purchase specifications, testing, and other possible contributors to SSC capabilities and availabilities
- Application of special treatments to SSCs to ensure acceptable capabilities and availabilities are defined and maintained

Oklo's Presentation described their method for the safety classification and treatment of SSCs. The presentation contained information that is consistent with the content of the Aurora COL application.

The NRC staff asked the public to provide their questions and comments to the NRC staff. Questions and comments were provided by:

- Matt MacCaughey
- Ben DeNardo
- Taylor Stevenson
- Alex Silver

In closing, the NRC staff indicated that it will review the information provided by Oklo and will decide on the next steps (additional meetings, audits, and/or RAIs) to further engage with Oklo on these Step 1 – Review licensing topics.

The meeting agenda is included as an Enclosure to this document. The meeting notice and meeting slides are located in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession Nos. ML20217L601 (Meeting Notice), ML20204A924 (Staff's Meeting Slides), and ML20237F576 (Oklo's MCA and SSC Slides), respectively.

Docket No.: 052-0049

Enclosure:
Agenda

cc: Distribution via list serv

B. Beasley

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DATED: September 3, 2020

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***via -email NRC-002**

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DATE	08/26/2020	8/26/2020	9/02/2020	9/3/2020

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AGENDA

Public Meeting with Oklo to Discuss Maximum Credible Accident and Classification of SSCs for the Aurora Reactor – August 4-5, 2020		
August 4, 2020		
Time	Topic	Speaker
1:00 pm – 1:10 pm	Opening Remarks and Introductions	NRC
1:10 pm – 2:00 pm	Review and Discussion of NRC Talking Points for MCA	NRC
2:00 pm – 2:20 pm	Additional MCA Discussion	Oklo
2:20 pm – 2:35 pm	Questions from the public	NRC
August 5, 2020		
Time	Topic	Speaker
1:00 pm – 1:10 pm	Opening Remarks and Introductions	NRC
1:10 pm – 1:30 pm	Review and Discussion of NRC Talking Points for Classification of SSCs	NRC
1:30 pm - 1:50 pm	Oklo Presentation on their method for SSC Classification in the COL application	Oklo
1:50 pm – 2:10 pm	Questions from the Public	NRC
2:10 pm – 2:15 pm	Next Steps	NRC