

December 21, 2020

U.S. Nuclear Regulatory Commission
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Subject: Oklo Inc. Response Letter to the NRC Letter, *Oklo Step 1 Technical Review of Key Safety and Design Aspect Activities Related to the Applicability of Regulations*, November 17, 2020

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Dear Ms. Mazza,

Oklo Inc. (Oklo) is issuing this letter to the U.S. Nuclear Regulatory Commission (NRC) as a response to the NRC letter, "Oklo Step 1 Technical Review of Key Safety and Design Aspect Activities Related to the Applicability of Regulations," herein referred to as the "NRC Step 1 non-applicabilities letter," dated November 17, 2020, with regard to the Oklo Aurora combined license application (COLA).

The basis of the current regulatory framework has been built for decades around light water reactors. NRC has stated for many years that the Commission is ready to receive applications for advanced fission technologies, in other words, non-light water reactors. This has been both evidenced in the NRC's developed expertise in advanced technologies, as well as explicitly stated in events, such as the June 2016 workshop: "The NRC could review and license a non-LWR today" (ADAMS Accession No. ML16155A428). Oklo also found the NRC prepared to receive an application for advanced fission technologies. The NRC staff implemented many novel approaches in their work with Oklo. Oklo began formal pre-application work with the NRC in 2016 and worked with the NRC to pilot a new application structure in 2018, which formed the basis for the COLA accepted for review in 2020.

It is clear that given that the existing regulations were formulated for light water reactors, there may be many portions which simply do not apply to advanced technologies which are not light water reactors. The NRC staff themselves have made this concept clear by the efforts undertaken in recent years. Among the efforts by NRC to prepare for non-light water reactors was guidance on principal design criteria, principal design criteria being required in 10 CFR 52.79. For light water reactors, criteria required to be addressed in the principal design criteria, the "General Design Criteria," is given in Appendix A to 10 CFR Part 50. Yet, an optional guidance document is sufficient legally to provide context without exemption to Appendix A, as stated by the staff, because the General Design Criteria simply "do not apply."

Oklo proposed a new approach to reactor licensing in part because it was necessary as the first non-light water reactor, but also in order to demonstrate regulatory pathways for advanced fission technologies, a necessary step to the advancement of safer, improved nuclear technology. A fundamental building block to this new licensing approach is the concept that certain regulations do not apply to all reactor types, referred to as non-applicabilities. Appropriate and clear treatment from the NRC on non-applicabilities has the potential to reduce uncertainty in the regulatory process, and enables an important step forward, as most new reactor concepts are neither water-cooled nor as large as the currently operating fleet. In contrast, failing to recognize that certain regulations do not technically and administratively apply results in a dangerous path of regulating by exemptions. Oklo is submitting this letter to document both its position regarding the NRC Step 1 non-applicabilities letter and its attempt to remove barriers for the advancement of safer and better nuclear technologies.

Summary

Although the NRC Step 1 non-applicabilities letter described the Oklo proposal as, “the applicability of a regulation to be ‘nested’ in what Oklo asserts are the assumptions underpinning each regulation,” this was only a partial description of what Oklo proposed in the Aurora COLA. As described in Part V, “Non-Applicabilities and Requested Exemptions,” of the Aurora COLA, non-applicabilities are described in the following way:¹

Regulations from the CFR for nuclear power plants generally have two characteristics: (1) they contain assumptions about the facility, and (2) they evoke that adequate protection is assured, in part, through compliance.

The delineation between regulations that apply and those that do not is nested in the former – the assumptions in each regulation. Many regulations in 10 CFR Part 50 and 10 CFR Part 52 were written under the pretense of large light water reactors (LWRs) and make assumptions about the technology in the language of each requirement. Many of the assumptions that these regulations make can be applied to other reactor technologies, besides large LWRs. However, some regulations make assumptions that are specific to either large reactors or reactors that are water-cooled. These regulations largely do not apply to reactors that are not large LWRs.

The NRC Step 1 non-applicabilities letter does not evaluate the proposed non-applicabilities description by Oklo. Further, the NRC Step 1 non-applicabilities letter barely references the Aurora COLA and largely disregards the approach proposed by Oklo. Instead, the NRC staff proposed a determination of applicability based on the plain language of the regulations, which was neither the methodology proposed by Oklo nor based on a thorough regulatory and technical review of the information provided by Oklo. Further, there is a generally recognized exception to the utilization of a plain language interpretation: specifically, it is rejected if it would produce an “odd” or “unintended” result. While the interpretation of the whole of the regulations would benefit from a thorough regulatory and technical review considering intent instead of a plain language interpretation, at a minimum, in these cases of where a plain language interpretation produces an odd or unintended result, the NRC still has discretion to look at the structure and context of the regulatory framework to interpret the regulations and the respective scope. Specifically in the context of the NRC Step 1 review letter, the conclusion that the subject regulations apply to the Aurora design on a “plain language” read yields an odd and unintended result because the purpose of those regulations relates to design features that are not present in the Aurora design.

As an example of a likely unintended result: in some cases, the NRC’s “plain language” interpretation results in different applicability determinations based upon whether an applicant submits a licensing action under 10 CFR Part 50 versus 10 CFR Part 52. For example, 10 CFR 50.62 establishes “Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants.” By definition, this requirement is only applicable to applicants for light water-cooled technology and would therefore not need to be addressed for a non-light water reactor requesting a license under 10 CFR Part 50. However, the content of applications section for 10 CFR Part 52 that references this section is technology neutral thus, by the NRC’s own interpretation, an identical design being submitted through 10 CFR Part 52 would require an exemption. This conflicting result of two identical designs demonstrates a clearly unintended result from this interpretation.

In contrast, there are many other available tools available to the NRC such as underlying intent, precedent, context, and so on. When reviewed from both a technical and a regulatory perspective, it is

¹ This definition is similar to the definition proposed by the Nuclear Energy Institute in its white paper, “Evaluation of the Applicability of 10 CFR Part 52 Content of Application Regulatory Requirements to non-Light Water Reactors.” A substantial portion of Oklo’s overall approach is based on pre-application interactions with the NRC staff.

apparent that these subject regulations are not technically relevant, are not intended to apply to the Aurora design, and therefore are not germane to the statutorily-required safety findings to be made by the NRC. Ultimately, a “plain language” read of the regulations is less legally defensible and aligns less with the Atomic Energy Act than a thorough comprehensive analysis.

Part V of the Aurora COLA proposes non-applicabilities and requested exemptions. Both licensing vehicles are needed for the licensing of most reactor technology, with non-applicabilities proposing a streamlined approach for advanced reactors. Specifically, Oklo proposed partial or full non-applicabilities in the three 10 CFR Part 52 sections that hold the requirements for a COLA, and the non-applicabilities were in over 20 topic areas.

In Part V of the Aurora COLA, Oklo provided a brief description of those regulations identified to be not applicable. Further, during the Step 1 review, Oklo provided several supporting documents, which include, “Oklo Inc. - Non-Applicabilities Justifications, Rev. 1.” This document is of note because it provided further information to assist the NRC staff in their review. It used clear identification, such as strikeout text, to ensure clarity of the portions of the requirements that were deemed to not apply. Importantly it contained technical and regulatory justifications for each of these non-applicabilities in a systematic manner that clearly identified the reason these regulations do not apply. The technical justifications provided technical information, including analysis, to demonstrate that the safety of the plant is not negatively impacted by the compliance or non-compliance of these subject regulations. The regulatory justifications provided a legal review that demonstrated a regulatory path to approval for the proposed non-applicabilities. These regulatory justifications were intended for the legal NRC staff and included investigative methods such as: underlying intent of regulations, precedent, previous board rulings, case law observations.

Timeline

The NRC staff specifically acknowledged the significance of the non-applicabilities portion of the Aurora COLA in its acceptance letter by stating, “Aligning on the applicability of NRC regulations to the novel Aurora design early will provide stability to the remainder of the review.” Although the Aurora COLA was accepted for review on June 5, 2020, Oklo did not receive a plan for the Step 1 review until August 27, 2020. One month after Oklo received a Step 1 review plan, the NRC staff and Oklo entered a non-applicabilities audit on September 28, 2020. Unfortunately, this audit was composed of only one 1 hour meeting, which occurred on October 23, 2020, between the NRC and Oklo staff. This singular meeting was neither a technical nor a regulatory discussion but instead primary a discussion of word choice and information already addressed in other portions of the Aurora COLA. Despite 24 topics proposed by Oklo, the NRC staff only engaged on a handful of topics. Of note is the fact that the NRC staff did not engage on any security or emergency preparedness topics, which comprise approximately 25% of the non-applicabilities, and are critical to Aurora’s economic viability and most importantly, are not necessary to ensure the safety or security of the plant.

The Step 1 review did not seem to allocate near enough effort to treat the non-applicability topic with the gravity recognized by the NRC staff and originally documented in the acceptance letter.

Conclusion and Next Steps

The NRC is charged with protecting the public health and safety through its regulation of the commercial use of nuclear materials, and has done so with great success over its more than 40 years of existence. However, Congress has recognized, through its issuance of the Nuclear Energy Innovation and Modernization Act, that the Agency must be both transformative and innovative in its approach to reviewing advanced reactor applications to ensure the strength of the U.S. nuclear fleet is not diminished by undue regulatory burden. With the NRC’s plain language approach, the NRC is moving

backwards instead of forwards, leaning further into prior regulatory language rather than using its highly skilled workforce to be transformative and appropriately interpret the underlying intent of the regulatory language for the purpose of assuring adequate protection for advanced reactor designs.

Ultimately, for advanced technologies to even be able to be available to the market, the regulator must be able to think critically and truly be innovative and transformative. Unfortunately, the response to the innovative, systematic, methodology proposed for the first ever combined license for an advanced fission plant received a response from the regulator that was far from innovative or transformative and which may have far-reaching negative impact on all future advanced fission technologies, even with a potential new Part 53.

Oklo will continue to move forward in working with the NRC in licensing of its designs, with this result in mind, to ensure that the nuclear industry moves forward in order to meet its global promise and potential. We look forward to further and increased engagement with the NRC on this topic.

If you have any questions or need any additional information, please contact us at regulatory@oklo.com.

Sincerely,



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CC:

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