



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

**U.S. NUCLEAR REGULATORY COMMISSION FEEDBACK AND OBSERVATIONS
REGARDING OKLO INC. WHITE PAPER, "CONSIDERATIONS FOR INCLUDING PRINCIPAL
DESIGN CRITERIA IN THE LICENSING BASIS IN 10 CFR PART 52"
(EPID NO. L-2023-LRO-0083)**

SPONSOR INFORMATION

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DOCUMENT INFORMATION

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Purpose of the White Paper: Oklo Inc. (Oklo) stated that the purpose of this white paper is to describe, from historical perspective, the principal design criteria (PDC) and the General Design Criteria (GDC) to which PDC of the current fleet conform, and to compare the relationship of the PDC to the licensing bases of both construction permits and operating licenses issued under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic licensing of production and utilization facilities," and combined licenses (COLs) issued under 10 CFR Part 52, "Licenses, certifications, and approvals for nuclear power plants."

Action Requested: Oklo requested the U.S. Nuclear Regulatory Commission (NRC) staff's feedback and observations on the information discussed in its white paper. Oklo provided specific questions that it would like the NRC staff to address in its feedback (ML23304A215).

FEEDBACK AND OBSERVATIONS

The NRC staff is making no regulatory findings on this white paper, and nothing herein should be interpreted as official agency positions.

The NRC staff's feedback and observations are primarily associated with the requirements of the following portions of 10 CFR:

- 10 CFR 50.59, "Changes, tests and experiments," establishes criteria for determining if prior NRC staff approval is required before a licensee makes changes in the facility or

Enclosure

procedures as described in the updated final safety analysis report (UFSAR) or conducts tests or experiments not described in the UFSAR referenced in an operating license issued under 10 CFR Part 50 or a COL under 10 CFR Part 52.

- 10 CFR 52.79(a)(4)(i) requires that an application for a COL include the PDC for a proposed facility.
- 10 CFR 52.80(a) requires the COL application to contain the “proposed inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will be operated in conformity with the COL, the provisions of the [Atomic Energy Act of 1954, as amended], and the Commission's rules and regulations.”
- 10 CFR 52.97(c) states that a COL shall contain the terms and conditions, including technical specifications, as the Commission deems necessary and appropriate.
- 10 CFR 52.98 states that if a COL does not reference a design certification or a reactor manufactured under a manufacturing license, a licensee may make changes in the facility or procedures as described in the UFSAR or conduct tests or experiments not described in the UFSAR “under the applicable change processes in 10 CFR part 50 (e.g., § 50.54, § 50.59, or § 50.90 of this chapter).” If a COL references a design certification or a reactor manufactured under a manufacturing license, then the change processes for those approvals apply for matters within the scope of the referenced approvals; the change processes in 10 CFR Part 50 apply to matters outside the scope of the referenced approvals.
- 10 CFR 52.103(g) states that the licensee shall not operate the facility until the Commission makes a finding that the acceptance criteria in the COL are met, except for those acceptance criteria that the Commission found were met under 10 CFR 52.97(a)(2).
- 10 CFR Part 50 Appendix A, “General Design Criteria for Nuclear Power Plants,” contains the GDC that “establish minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission.” Appendix A also states that the GDC are “generally applicable to other types of nuclear power units and are intended to provide guidance in establishing the principal design criteria for such other units.” In addition, the first paragraph of the introduction to appendix A defines the scope of the PDC to include “the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components [SSCs] important to safety.”

1.0 FEEDBACK ON SPECIFIC QUESTIONS

1.1 Feedback Request 1

Does the NRC consider a licensee’s compliance with the NRC’s regulations and the Inspections, Tests, Analyses, and Acceptance Criteria attribute of COLs, together with NRC oversight, necessary and sufficient to ensure that nuclear power plant facilities licensed under 10 CFR Part 52 have been constructed in conformity to the COL and the PDC in the COL?

NRC staff feedback:

Once a COL has been issued under 10 CFR Part 52, it is the COL holder's responsibility to conform with NRC regulations, its license, and the conditions on the license, including the Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). To issue the COL, the NRC staff must find, in accordance with 10 CFR 52.97(b), that the ITAAC are necessary and sufficient such that satisfying the ITAAC provides reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the Atomic Energy Act of 1954, as amended (AEA), and the NRC's rules and regulations. The licensee may not operate the facility until the NRC makes its finding under 10 CFR 52.103(g) that the acceptance criteria in the ITAAC in the COL are met. The NRC staff makes this finding based on information from licensee ITAAC notifications made under 10 CFR 52.99 and from the NRC's inspection and oversight programs.

1.2 Feedback Request 2

Does the NRC consider changes to PDCs to meet the criteria of 10 CFR 50.59, "Changes, tests, and experiments," as requiring prior NRC approval because changes to the PDCs fail the "more than a minimal increase" tests of 10 CFR 50.59?

NRC staff feedback:

The 10 CFR 50.59 process applies to operating licenses and COLs, but not construction permits. For information in the UFSAR that is subject to 10 CFR 50.59, the NRC staff considers that changes to the PDC should be evaluated against the criteria in 10 CFR 50.59 and acknowledges that the statements of consideration for the 10 CFR 50.59 rulemaking state on page 53589 of Volume 64 of the Federal Register (64 FR 53589) published on October 4, 1999, the following:

Although the final rule allows minimal increases, licensees still must meet applicable regulatory limits and other acceptable criteria to which they are committed (such as are contained in Regulatory Guides and nationally recognized industry consensus standards, e.g., the ASME B&PV Code and IEEE Standards). Further, departures from the design, fabrication, construction, testing, and performance requirements as outlined in the General Design Criteria (appendix A to part 50) are not compatible with a "no more than minimal increase" standard. Because the "no more than minimal" standard allows for there to be some increase compared to the current requirement, which would have required any increase to be submitted for prior staff review, NRC needs to establish a point beyond which one would conclude that the increase is not minimal. Application of the "minimal increase" concept to the specific criteria in the revised final rule is discussed in the next sections.

This statement was incorporated into NEI-96-07, Rev. 1, and endorsed by the NRC with clarifications in RG 1.187, Revision 3.

In the absence of additional information on the proposed PDC and any potential changes that may be considered, the NRC staff does not presuppose the outcome of the evaluation of such a change against the criteria of 10 CFR 50.59 and notes that the language quoted above applies to departures from the "design, fabrication, construction, testing, and performance requirements" in the GDC and not to changes to as-yet-undefined design-specific PDC. In addition, it is unlikely that a change to a PDC would be considered in isolation; any associated changes to or departures

from the UFSAR and the facility would also need to be evaluated against the criteria of 10 CFR 50.59.

Information within the scope of a referenced design certification or a reactor manufactured under a manufacturing license would be subject to the change processes for those referenced approvals. Construction permits are not subject to 10 CFR 50.59, but as Oklo points out, the final rule promulgating the GDC (36 FR 3255), published February 20, 1971, stated that “[p]rincipal design criteria established by an applicant and accepted by the Commission will be incorporated by reference in the construction permit.” Also, historically, construction permits included a condition requiring the facility to be constructed “in accordance with the principal architectural and engineering criteria and commitments set forth therein.”¹ While the NRC never specifically defined what the “principal architectural and engineering criteria” include, the NRC staff considers that the PDC would be among the principal architectural and engineering criteria.

1.3 Feedback Request 3

If the NRC considers that COLs must include conditions requiring conformance with the PDCs, what is the NRC’s reasoning for that conclusion?

NRC staff feedback:

The NRC staff has determined, in general, that 10 CFR 50.59 is adequate to control changes to the UFSAR, including the PDC, after the COL has been issued, and therefore a license condition is not necessarily needed in the COL to control changes made to the PDC.

Please note that under the provisions of 10 CFR 52.97(c), the NRC staff (and the Commission) have the authority to add a license condition if deemed necessary and appropriate.

2.0 OBSERVATIONS

2.1 General Observations

Since the GDC were developed for light-water reactors (LWRs), the NRC staff developed Regulatory Guide (RG) 1.232, "Guidance for Developing Principal Design Criteria for Non-Light-Water Reactors," which provides guidance to applicants for developing PDC for non-light-water reactors (non-LWRs). This RG includes a set of technology-inclusive advanced reactor design criteria for non-LWRs, as well as two sets of technology-specific, non-LWR design criteria that address sodium cooled fast reactors and modular high-temperature gas-cooled reactors. These non-LWR design criteria developed by the NRC staff are not considered to be final or binding regarding what may eventually be required from a non-LWR applicant. It is the applicant’s responsibility to develop the PDC for its facility based on the specifics of its unique design, using the GDC, non-LWR design criteria, or other design criteria as the guidance for the starting point. Further, the applicant is responsible for identifying and satisfying necessary safety requirements and for considering public safety matters and fundamental concepts, such as defense in depth, in the design of its specific facility.

¹ See, for example, the construction permit for Shearon Harris Nuclear Power Plant (January 27, 1978; ML020560123).

2.2 Specific Observations

2.2.1 Observation 1

Section 2.1 of Enclosure 1 states: "In sum, the GDC were developed for the current fleet of operating LWR plants. For newer or different technologies, their scope may not be appropriate and must be adjusted to the technology in the application."

NRC staff observation:

The NRC staff view is that the scope of PDC, including GDC, is technology neutral. Appendix A of 10 CFR Part 50 defines the scope of PDC to include "the necessary design, fabrication, construction, testing, and performance requirements for [SSCs] important to safety," and an exemption would be needed to change the scope of PDC. The NRC staff acknowledges that the specific GDC may not be appropriate for newer or different technologies, but the scope of the GDC still applies.

2.2.2 Observation 2

Section 2.1 of Enclosure 1 states, "However, while the GDC are broad goals, they were still only considered appropriate for traditional light water reactors (LWRs), similar to those construction permits already issued at the time."

NRC staff observation:

The NRC staff would characterize the GDC as potentially appropriate for non-LWRs. That is, the GDC were appropriate for traditional LWRs, and a portion of them may be appropriate for non-LWRs. Another way of stating the NRC staff's view is that the GDC are requirements only for traditional LWRs and are guidance for non-LWRs.

2.2.3 Observation 3

Section 1 of Enclosure 1 states, "First, to ensure the facility is constructed in conformance with the PDC as described in the application, 10 CFR Part 52 licenses use the inspections, tests, analysis, and acceptance criteria (ITAAC) requirement, which must be met before issuance of the finding under 10 CFR 52.103, 'Operating under a combined license,' paragraph (g), and operation of the facility."

NRC staff observation:

The NRC staff notes that the purpose of ITAAC is broader than mentioned in this statement. Specifically, the ITAAC must be necessary and sufficient, when successfully completed by the licensee, to provide reasonable assurance that the facility has been constructed and will operate in conformity with the COL, the provisions of the AEA, and the Commission's rules and regulations.

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