OKLO INC.

Meeting on safety classification, PRA, & materials

June 27-30, 2023

Agenda

Approach to safety classification and SSC classification case study

Materials usage for key components

Role of PRA

Purpose and goals – safety classification

Solicit feedback from the NRC staff on Oklo's approach to safety classification

Demonstrate how Oklo's safety classification approach is an improvement over the current approach

Provide a detailed case study implementation of Oklo's safety classification process

Show how programmatic controls are the building blocks that support design commitments and design bases to provide a clear licensing basis for review and oversight of Oklo's reactor facilities

Advantages for advanced fission

Advanced fission technologies have **unique safety characteristics** that change the way they should be analyzed and the way they should be classified

Advanced reactor developers also **benefit from extensive lessons learned** from the operating fleet for ensuring proper design control

Because Oklo's business model includes being the designer, owner, and operator of its plants, Oklo is motivated to leverage these benefits to simplify both the safety case and the operational requirements of the facility

Inherent and passive

Advanced reactors can rely more on inherent features and passive functions than active functions, and **Oklo's designs primarily rely on inherent features**

Oklo's safety classification approach therefore focuses on "functions and features" rather than functions alone, because this better captures the safety characteristics of the system

Inherent features do not experience binary failure like active functions, but rather experience degradation without total loss of the features, and therefore must be analyzed and ultimately classified differently

Consistent with NRC policy

Oklo's designs, and all advanced fission technologies, should be recognized for their contribution to meeting the U.S. Nuclear Regulatory Commission's (NRC's) Policy Statement on Advanced Reactors, as commonly quoted:

> *"Regarding advanced reactors, the Commission expects, as a minimum, at least the same degree of protection of the environment and public health and safety and the common defense and security that is required for current generation light-water reactors (LWRs). Furthermore, the Commission expects that advanced reactors will provide enhanced margins of safety and/or use simplified, inherent, passive, or other innovative means to accomplish their safety and security functions."*
>
> - NRC's Policy Statement on the Regulation of Advanced Reactors as provided in the *Federal Register* (73 FR 60612)

Clear line of sight

It is in Oklo's best interest to provide the staff clear regulatory controls to increase transparency in the oversight of its facilities

By assigning specific regulatory controls to the important functions and features of the system, Oklo provides a direct line of sight to the portions of the design that must be upheld to maintain its licensing basis

By classifying functions and features (as opposed to labeling SSCs), Oklo provides specificity in what portions of an SSC are relied on to ensure safety or compliance

Sources of regulatory controls

Oklo evaluates its facilities from the ground up, largely from a first principles approach, rather than designing to LWR technology safety metrics, to determine which functions and features require regulatory controls (the main focus of the “safety classification” approach)

Oklo also evaluates compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) and clearly identifies the additional functions and features, beyond those identified in the ground-up analysis, that are required to meet the regulatory requirements

The result of this thorough evaluation is the full inventory of functions and features Oklo’s facilities rely on to either (1) uphold the safety case of the design or (2) comply with 10 CFR

Purpose and goals - materials

Provide an overview of materials in the Aurora powerhouse

Compare the materials in the Aurora powerhouse to previously tested and demonstrated conditions

Solicit feedback on focus areas for future reviews

Oklo’s use of materials

Oklo’s design philosophy is to utilize materials with demonstrated operating experience in the relevant environment and demonstrated material compatibility

- Materials chosen based on proven, successful operating experience
- Use predictable, well-characterized, code-qualified materials
- Operating envelope chosen to be conservatively bounded by operating experience

Oklo has also reviewed the staff draft guidance document DANU-ISG-2023-01 for specific material considerations

Presentation will discuss industry history with materials used by Oklo

Oklo will identify how its materials fit within the envelope of that operating experience

Oklo will also discuss how it plans to address key material-related regulatory topics

Purpose and goals - PRA

Describe Oklo's use of probabilistic risk assessment (PRA)

Solicit feedback on the intended development timelines for Oklo's PRA model

Discuss the relationship of NRC PRA requirements and policy to Oklo's use of PRA

Oklo’s use of PRA

Supports design and analysis, developed it in parallel with the design

Use of event trees for identifying bounding events

PRA quantification and risk insights informed by PRA scope and data limitations

Oklo has evaluated requirements and Policy in considering the role of PRA in licensing basis