OKLO INC.

Licensing Approach and Process

July 31, 2023

Agenda

9:00	AM	-	9:20	AM	Public portion
9:20	AM	-	9:35	AM	Introduction to Oklo
9:35	AM	-	10:05	AM	Introduction to fuel recycling
10:05	AM	-	10:15	AM	Break
10:15	AM	-	11:30	AM	Licensing pathway
11:30	AM	-	12:00	PM	Wrap up

Goals for the meeting

Familiarize NRC staff with Oklo, as well as Oklo's reactor design

Familiarize NRC staff with Oklo's motivation to recycle fuel

Present initial research into Oklo's intended pathway for licensing a commercial recycling facility

Inform upcoming pre-application engagement

Use in-person meetings to facilitate open communication and obtain NRC staff feedback

Introduction to Oklo

Oklo product development

Oklo is committed to designing, licensing, and deploying reactors at scale to meet its customer needs

Fastest path to commercialization leverages technologies with extensive operational experience and a robust supply chain

SFR legacy

Building on >400 reactor-years of SFR operation

Globally, more than 20 SFRs have operated

In the United States (U.S.) alone, about 60 years of sodium fast reactor (SFR) operation, including key operating data from two experimental reactors:

- EBR-II – 62.5 MWt, operated 1963-1994
- FFTF – 400 MWt, operated 1980-1993

	U.S.	Russia	Europe	Asia
Past	EBR-I EBR-II SEFOR FFTF Fermi-1	BN-350	PFR Rapsodie Phénix Superphénix	
Cancelled	Clinch River IFR		SNR-300	
Under decommissioning				Monju
Operating		BOR-60 BN-600 BN-800		FBTR CEFR
Under repair				Jōyō
Under construction		MBIR		PFBR CFR-600

Integral Fast Reactor program

Integral Fast Reactor (IFR) was a program supported by the Department of Energy (DOE) to demonstrate closing the nuclear fuel cycle and prepare for commercialization of metal fueled fast reactors

Requirements of the IFR next-generation reactor:

1. Efficient utilization of resources
2. Inherent safety
3. Waste management
4. Safeguards against proliferation

IFR program included the Experimental Breeder Reactor-II (EBR-II) and the adjacent Fuel Conditioning Facility (FCF)

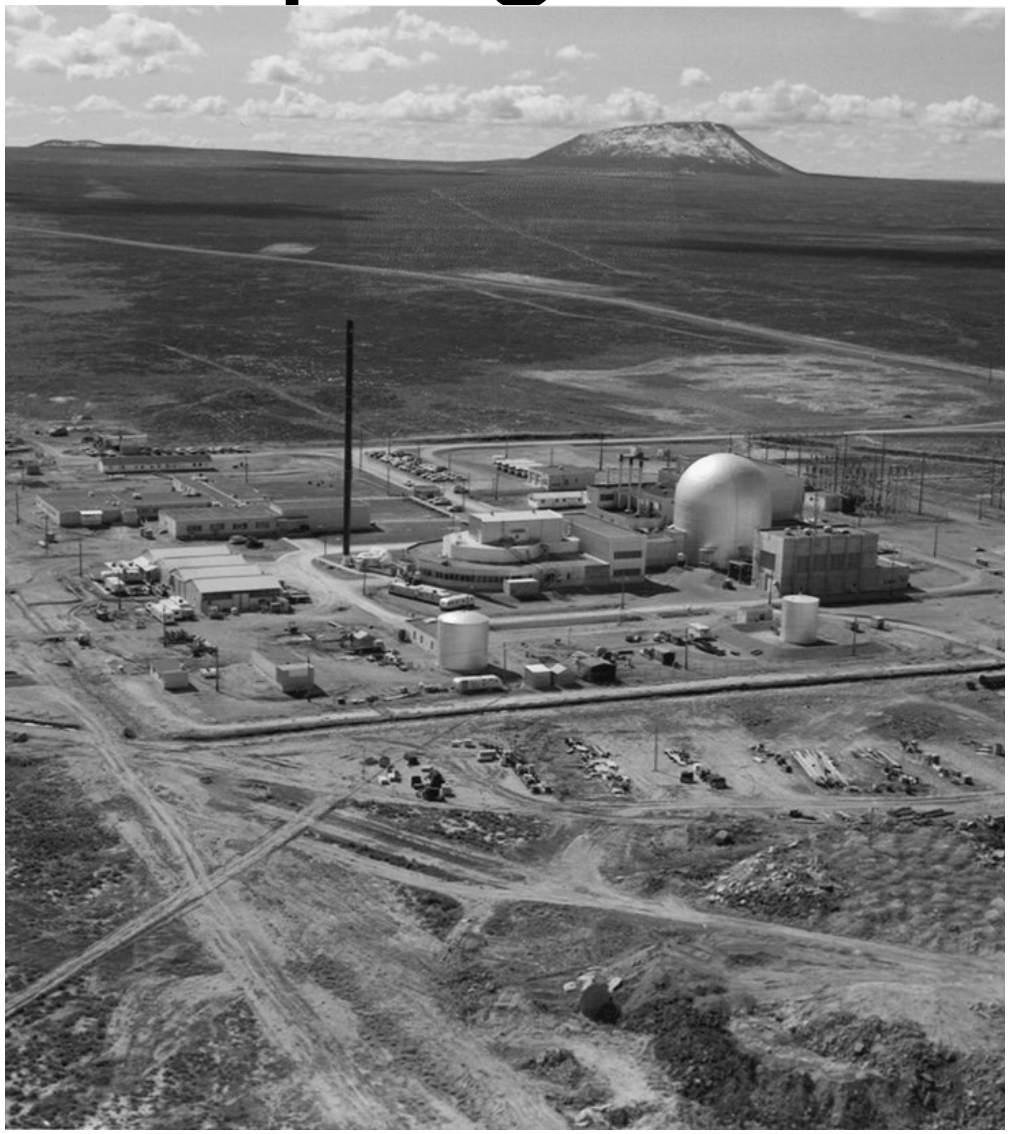
Integral Fast Reactor program

Legacy built on recycling activities at EBR-II that demonstrated a closed fuel cycle

Early version used melt refining, later advanced to electrorefining

Over 35,000 pins were recycled

Argonne has done significant technology development since



Fuel recycling and fast reactors

Oklo is designing fast reactors partially because of their ability to reuse fuel

Motivation for recycling is to unlock availability of fuel in the U.S.

What is a fast reactor?

Type of fission reactor that operates using fast neutrons

Operating principles proven by some of the first operating reactors in the world – currently fast reactors are an advanced technology when compared to LLWRs because of key advantages they provide:

1. Better fuel utilization
2. Simple safety case
3. Waste reduction capabilities

Simple safety case

Fast reactors have exceptional safety characteristics that are inherent

- Strong negative reactivity feedbacks that are proven
- Metal fuel offers many safety benefits including high thermal conductivity
- Liquid metals can be more conductive than water and enables no pressurization

Oklo's design philosophy as an owner-operator is to make intentional design choices to reduce the operational burden

Used fuel opportunity

The U.S. has produced 90,000 tons of used oxide fuel

- This fuel contains >90% of the original energy content
- This could power the entire U.S for >100 years

Current HALEU sources are limited:

- Downblending used EBR-II fuel → awarded to Oklo in 2020
- Domestic fresh HALEU → Centrus/Oklo Letter of Intent in 2021

Electrorefining

Oklo will be using electrorefining-based technology (as opposed to aqueous-based)

Electrorefining for used nuclear fuel reconditioning was originally developed by Argonne in the 1960s and continues to be matured

It is actively being used at the INL Fuel Conditioning Facility (FCF) to process used EBR-II fuel

FCF Operations (*Credit: INL*)

Government projects

Oklo is working in collaboration with Argonne and INL to industrialize the electrorefining technology to production-scale readiness, including:

- Optimizing salt processing for removal of fission products
- Improving electrode performance
- Development of sensors for process control
- Development of sensors for MC&A

TECHNOLOGY COMMERCIALIZATION FUND

ARPA-E OPEN

ARPA-E ONWARDS

ARPA-E CURIE

Licensing pathway

Problem statement

Oklo intends on licensing, building, and operating a commercial recycling facility

The technology is proven but is unique to that the NRC has previously licensed

The licensing pathway and how Oklo's technology fits within decades old facility definitions is unclear

Initial regulatory analysis

Oklo reviewed a broad set of regulatory documents (mainly NRC documents) to understand how the NRC and the NRC staff have viewed the licensing of recycling facilities in the past

Oklo also reviewed other non-NRC documents (e.g., NEI white papers, Part 7X, etc.) for the same reason

Conclusion and next steps

Oklo's assessment of the potential licensing pathways is informed by both previous staff positions and considerations, along with a recognition of the differences presented by Oklo's electrorefining processes

Oklo is looking to align with the NRC staff on licensing approach and mechanisms by which that approach can be utilized, which will inform next steps

Questions