NE-25-37814 Development of Novel Deconversion Technology

Oklo Inc., located in Santa Clara, California, is developing next-generation fission powerhouses to produce abundant, affordable, clean energy at a global scale – starting with the Aurora, which can produce up to 75MWe of electrical power.

Deconversion of UF_6 to uranium metal is crucial after the enrichment of High-Assay Low Enriched Uranium (HALEU) for metal fueled fast reactors. The high temperature UF_6 to UF_4 reduction in H_2 and F_2 must be kept anhydrous and carried out at a temperature well above the autoignition temperature of hydrogen. The engineering systems required to make these reductions, and the safety issues present in these conditions, are of concern. Therefore, Oklo is exploring other pathways to reduce the chemical hazards.

Oklo will partner with Pacific Northwest National Laboratory (PNNL), which has demonstrated gram-scale reduction of UF_6 to UF_4 through an intermediary compound that significantly reduces the traditional method's hazards. PNNL has also shown the viability of co-reducing fluorides to metal. The possibility of eliminating the intermediate UF_4 production step will have the potential of increased throughput and process safety that will help accelerate deployment of a commercial fabrication facility.