**RFA-18-15829, Accelerate Development of Industry-Relevant Features in Modern Simulation Tools**

The advanced reactor industry needs usable, modern simulation tools to develop their technologies and bring new reactors to market. Usability means tools that are approachable and attainable so that companies can easily acquire codes and train employees to use them. Usability also means empowering, such that experienced users can quickly and accurately perform analyses and iterate on design features. Modern simulation software means best-in-class methods, in a codebase that is maintainable and extensible. Modern tools can run easily on multiple architectures and can be easily updated and extended to new reactor designs or configurations. Many of the legacy tools available to reactor developers today fail on both of these measures. They provide valuable capabilities, but they were not built to the standards required today. The result is that Oklo, Inc. and other reactor designers painstakingly perform design iterations using laborious workflows that were not intended for such purposes. New simulation tools currently under development are substantially improving this situation, but important gaps remain.

Oklo, Inc. will partner with Argonne National Laboratory to further develop OpenMC and add capabilities of particular relevance to the advanced reactor industry. This project will commit additional resources to the code, so that the team can address industry priorities without disruption to their current work. Specifically, the voucher will provide resources targeted at the need for more powerful visualization capabilities, as well as facilitate additional coupling features needed to make those capabilities more extensible between OpenMC and BISON, the fuel performance code built on the MOOSE open-source multiphysics framework. Oklo, Inc. will also partner with Idaho National Laboratory to further develop the heat pipe simulation code Sockeye. The code is capable of simulating sodium heat pipes undergoing slow transients, and easily couples with BISON as both tools are built upon the MOOSE Multiphysics framework.

This project will accelerate the development of industry-relevant features in OpenMC, BISON, and Sockeye, and accelerate the technology development timeline for Oklo, Inc. and other reactor developers.