

NE-25-36439 – Independent Verification and Benchmark of Deep Fission's Deep Borehole Microreactor Thermal Hydraulic System Behavior

Deep Fission, Inc., located in Berkeley, CA, is pioneering a bold new approach to delivering clean, reliable, and affordable electricity by placing their microreactor in a bore hole one mile underground. Their mission is to be a leader in fighting climate change for future generations by bringing affordable electricity to consumers now.

Before working on a more detailed design of the system, an independent assessment of the thermal hydraulics of the reactor is needed given the placement of the reactor. The project is the creation of an independent system model in RELAP5-3D of the Deep Fission conceptual reactor design in a deep borehole to evaluate both normal and off normal reactor conditions.

Deep Fission will partner with Idaho National Laboratory (INL) to enhance its thermal hydraulics infrastructure using RELAP5-3D modeling. INL has unique expertise in developing thermomechanical and thermos-hydro-mechanical models in deep geological repositories for used nuclear fuel and geothermal applications involving deep hole drilling and heat extraction.