

NE-25-37676 Molten Salt Nuclear Graphite Qualification Plan

Natura Resources LLC is headquartered in Abilene, Texas. They specialize in advanced reactor development of small modular reactor systems that are liquid molten fluoride salt fueled. Natura Resources is committed to answering the world's increased demand for reliable energy, medical isotopes, and clean water by developing commercially deployable molten salt reactors.

In support of Natura's MSR-100, a qualified graphite grade will be required for neutron moderation. Irradiation-induced changes to graphite dimensions and properties need to be considered as part of the safety analysis to demonstrate safe performance over the operating lifetime of the graphite in the reactor.

Natura will partner with Oak Ridge National Laboratory (ORNL) to develop a graphite qualification plan and identify performance characteristics and development plans to design, approve, and perform graphite irradiations with fuel-bearing salts. The plan will look at utilizing the High Flux Isotope Reactor (HFIR) at ORNL which would allow for rapid neutron irradiation of graphite (7-10 dpa per year) in a future irradiation test outside of the voucher scope. The project will also include the development of fuel-bearing, molten salt irradiation capsules to support the future irradiation test.