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An Overview of Molten Salt Reactors – History, Design, and Future Prospects

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In the nuclear industry, there are several startup companies simulating, developing and testing new nuclear reactor designs. One of the many reactors being designed is the Molten Salt Reactor (MSR). MSRs were conceptualized and popularized by Oak Ridge National Laboratory in the 1960s. With the recent resurgence in interest regarding this type of reactor because of the economic and technical advantages, this research project aims to provide a historical context for their development, specific design specifications, and reactor core design modifications over time. In addition, this study focuses on various types of nuclear fuel, reactor geometries, potential moderator materials, and the utilization of different simulation tools such as MCNP and OpenFOAM as applied to MSR core analysis. There are several national and international research organizations conducting studies on MSRs. By obtaining information from the publications from these groups as well as other published sources, this project aims to provide a solid foundation of knowledge for current and future research projects regarding MSRs. This specifically pertains to the ongoing research into MSRs at Kennesaw State University.