

Advanced Thermal Reactor Concept

NE's research into advanced reactor technologies offers the promise of improved economics, higher efficiency energy production, and more robust nonproliferation characteristics over existing reactor designs.

NE seeks a university-developed design for an advanced high temperature, thermal neutron spectrum reactor concept such as a fluoride salt-cooled or other technology, that will be proven through analysis and experimentation. The advanced high temperature reactor design to be proposed should represent a promising approach capable of moving nuclear reactor technology beyond the light water-cooled, helium-cooled, and sodium-cooled concepts now being investigated through NE's existing nuclear reactor and fuel cycle research and development programs. It should also incorporate robust nonproliferation features. Approaches to evaluating the concept should be coupled to a comprehensive research plan for addressing key issues related to development and commercialization of the advanced high temperature reactor concept.

The project should be focused on the design, development and fabrication of a transformative, advanced high temperature, thermal neutron spectrum reactor concept. The project should include an integrated evaluation program utilizing both in-reactor and non-reactor testing at a university, laboratory or other available U.S. test or research reactor to derive performance and safety information on neutronics, thermal hydraulics, and structural compatibility. The proposed reactor concept should be novel but allow for adequate evaluation by the end of the three-year period of performance. It is expected that the team will utilize a cadre of experimental facilities to demonstrate critical technologies. The university consortium chosen shall produce a report that describes design, fabrication, operation, and approaches for commercialization of the proposed reactor design. In addition the report should describe technical, economic and regulatory steps necessary to demonstrate and commercialize the proposed thermal reactor design in the near term. Proposals should be for a period of three years and a total cost not to exceed \$7.5 million.