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July 29, 08

U.S. Selects Teams to Develop “Deep Burn” Nuclear Fuel Recycling

The U.S. Department of Energy has announced that it has selected teams led by Idaho National Laboratory and Argonne National Laboratory to advance the technology of nuclear fuel “Deep-Burn,” in which plutonium and higher transuranics recycled from spent nuclear fuel are destroyed while generating energy. This revolutionary technology not only advances nuclear power production but reduces the amount of radioactive waste produced in the end.

Through a competitive process, two national laboratories teams from Idaho National Laboratory and Argonne National Laboratory were selected for work totaling \$7.3 million. To accomplish their mission, the Idaho and Illinois-based laboratories are partnering with other national laboratories, universities, and industry.

“Deep-Burn R&D is valuable, it has the potential to greatly reduce the amount of long-lasting waste produced by the nation’s next generation of nuclear power reactors. At the same time this technology could greatly increase the amount of safe, economical, carbon-free electricity generated by advanced nuclear fuel,” said DOE Assistant Secretary for Nuclear Energy Dennis Spurgeon.

These R&D activities are aimed at establishing the technological foundations that will support the role of the Very-High-Temperature, gas-cooled Reactor (VHTR) in the nuclear fuel cycle, one of the prototype reactors being researched under the Department’s Generation IV Nuclear power program. The work will be carried out in two parts: Advanced Modeling and Simulation Capability for VHTR Development and Design at a cost of \$1 million led by Argonne National Laboratory; and Transuranic Management Capabilities of the Deep-Burn VHTR at a cost of \$6.3 million led by Idaho National Laboratory.



The primary mission of the Next Generation Nuclear Plant (NGNP) remains the production of high-temperature heat for use as a source of process heat for generation of electricity. A further goal of this work is to enable a quantitative assessment of the scope, cost and schedule implications of extending the NGNP mission in the future to destruction of plutonium and other transuranics. The Deep-Burn R&D effort will be coordinated with the ongoing Global Nuclear Energy Partnership (GNEP) programs to ensure synergism and to avoid duplication of efforts. The R&D that will be carried out is a part of DOE’s Generation IV program which aims to further the fundamental R&D to ensure the viability of the next-generation of nuclear energy systems.



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