Licensing Challenges for Fuel Cycle Facilities Under the Global Nuclear Energy Partnership

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In January 2006 the Department of Energy (DOE) announced the creation of the Global Nuclear Energy Partnership (GNEP), an ambitious plan to reshape the nuclear energy production sector both in the United States and worldwide. If fully realized in the United States, GNEP would entail the construction of a large number of sodium-cooled fast reactors (SFRs) designed to utilize actinide-based fuels, multiple commercial-scale reprocessing plants for both light-water and fast reactors, and fast reactor fuel fabrication plants. One proposed system would include a co-located fast reactor, separations plant and fuel fabrication facility.

Although the first few GNEP facilities may be built on DOE sites and (barring an act of Congress) would not have to be licensed by the NRC, it is likely that a full-scale GNEP complex would fall under NRC jurisdiction. This responsibility would pose enormous challenges for NRC, which has no recent experience in licensing either reprocessing plants or fast reactors, and only limited experience with licensing a plutonium fuel fabrication facility. These challenges will be compounded by the fact that the proposed GNEP facilities will be largely based on novel and untested designs and processes that have not been developed on a commercial scale.

Important issues that will be encountered in GNEP licensing are identified by reviewing the regulatory history of related efforts, examining the potential implications of NRC's current policies and regulatory requirements, and analyzing the impacts of post-9/11 security issues on requirements for physical protection, material control and accounting, and international safeguards.