December 12, 2007

MEMORANDUM TO: Margie Kotzalas, Chief
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SUBJECT: OCTOBER 1-4, 2007, SUMMARY OF GLOBAL NUCLEAR ENERGY PARTNERSHIP ANNUAL MEETING IN PHOENIX ARIZONA

PURPOSE:

To discuss the current status and ongoing research and development activities of the Department of Energy's (DOE's) Global Nuclear Energy Partnership (GNEP) program.

ATTENDEES:

NRC; Yawar Faraz, Wilkins Smith, and Lauren Gibson

Other attendees (over 200) included officials from the DOE and its national laboratories including contractors, the Government Accounting Office, university professors and students, members of the public, and foreign nationals.

DISCUSSION:

This was the second annual meeting arranged by DOE on GNEP. The agenda is enclosed.

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Buzz Savage of DOE began the proceedings with an overview of the GNEP status and objectives. He noted that about 12 DOE staff members were managing the GNEP program with the bulk of the support coming from the national laboratories. He pointed out that the last GNEP annual meeting had about 100 attendees, while there were 217 individuals registered to attend the current annual meeting. He, and other DOE presenters, explained the Nuclear Regulatory Commission's (NRC's) role in GNEP. He also mentioned that Dr. Carl Paperiello, Bruce Matthews, and Jim Tulenko were members of an independent review team to evaluate GNEP technical issues.

Paul Lisowski, DOE's GNEP Deputy Program Manager, presented the keynote address on the future of GNEP. He discussed the importance of GNEP to meet the growing global energy demand for energy. DOE's GNEP budget for Fiscal Year (FY) 2007 was $167.5 million. DOE's request for FY 08 is $405 million. GNEP is gaining momentum on a global scale as illustrated in September 2007 during the second Ministerial meeting in Vienna, Austria, when 11 countries joined the original 5 Partner countries (United States, France, China, Russia and Japan). At the expected use of nuclear power, by the end of 2100, without recycling of spent nuclear fuel, a significant number of additional geologic repositories would be needed.

The GNEP program activities are aligned into seven campaigns (working groups) to provide improved program management across the DOE offices and national laboratories and integrate, particularly with industry activities, priorities and resources for technology development, research and development, and modeling and simulations. The campaign working groups are:

(1) Transmutation Fuels

(2) Separations Technologies

(3) Fast Reactor Design and Analysis

(4) Safeguards

(5) Waste Management and Advanced Waste Forms

(6) Systems Analysis

(7) Grid-Appropriate Reactors

The seven campaigns are supported by two cross-cutting efforts of Modeling and Simulation and Safety and Regulations.

On September 28, 2007, DOE established cooperative agreements with four commercial teams (consortiums) for developing commercial-scale GNEP facilities, namely the Consolidated Fuel Treatment Center (CFTC) and the Advanced Burner Reactor (ABR). The CFTC and ABR are currently planned to be commercial facilities which would require an NRC license. The four consortia are as follows:

(1) AREVA Federal Services, LLC, and Mitsubishi Heavy Industries, with Battelle Memorial Institute, BWXT, Japan Nuclear Fuel Limited, Washington Group International;

(2) Energy Solutions, LLC, with Principles including The Shaw Group, and Westinghouse Electric Company, and others including AECL, BoozAllenHamilton, Nexia Solutions, NFS, and Toshiba;

(3) GE-Hitachi Nuclear Americas, LLC, with Burns and Roe, Ernst and Young, Fluor, IBM, KAERI, and Lockheed Martin; and

(4) General Atomics with United Technologies, Hamilton-Sundstrand, Rocketdyne, CH2M Hill, a Russian consortium led by OKB Mechanical Engineering (OKBM), and Potomac Communications.

Each of these four consortia will be providing DOE the following deliverables:

(1) Business Plan detailing how the marketplace will facilitate DOE in developing and commercializing the needed advanced fuel cycle technologies and facilities to meet GNEP goals;

(2) Conceptual Design Studies containing engineering design concepts and their associated scope, cost and schedule information for the initial nuclear fuel recycling center and initial advanced recycling reactor;

(3) Technology Development Roadmap describing the state of readiness of the proposed technology and methods and plans to acquire needed technologies to support GNEP deployment; and

(4) Communications Plan containing scientific, technical and practical information related to nuclear energy and the closing of the nuclear fuel cycle packaged in such a manner that costs and benefits can be easily understood by the public and other key stakeholders.

The GNEP draft and final programmatic environmental impact statements (PEIS) are expected to be issued in fall of 2007 and in late spring of 2008, respectively. The PEIS will evaluate various alternatives for closing the fuel cycle. It will identify the preferred alternative and identify the site for the Advanced Fuel Cycle Facility (AFCF). About 14,000 comments were received during the scoping meeting for the PEIS.

Phillip Finck of INL, described the responsibilities and activities of his Technical Integration Office (TIO) established by DOE to integrate activities across national laboratories and serve as the point of contact between industrial participants and the national laboratories, for integration, coordination, and reporting. The TIO will be setting up a web-based system where its interactions with the four industry teams involving non-procurement questions and answers will be posted and accessed by all industry teams. The TIO had established a central GNEP document management system containing about 700 documents that would be accessible to DOE's national laboratories, contractors, and universities working on GNEP.

Sal Golub, DOE's Director for Fast Reactor Development provided a status of the Advanced Burner Reactor project.

Dan Stout, DOE's Director for Light Water Reactor Spent Fuel Separations, provided a status of the CFTC. The separation processes under consideration include a UREX-based or Purex-based aqueous process without separation of pure plutonium or an electrochemical process (pyro-chemical) without separation of pure plutonium. Uncertainty remains in the technical and commercial viability of large scale advanced separations and the cost effectiveness of ABR technology. Although industry believes that the first ABR could be built in the 2020 – 2025 time-frame, there may be a market driven alternative of near-term recycling in light-water reactors (LWRs) (with mixed oxide [MOX] fuel). This possible interim step may allow an opportunity to conduct more technology development and improve the cost effectiveness of sodium fast reactor technology. Although LWR recycle with MOX fuel would not ultimately reduce the amount of plutonium (Pu), additional production of Pu would be limited while improvement can be made to reduce the cost of actinide recycling in the ABR. In response to possible market interest in LWR recycling with MOX fuel, there may be interest in exploring NRC licensing of MOX fuel in LWRs. However, for any fuel recycling to be viable in the United States, the Nuclear Waste Policy Act would need to be amended in order to effectively manage the potential products and waste streams in a manner that is commensurate with their hazards.

Andrew Griffith, Acting Project Director, AFCF, provided the status of the AFCF which will support research, development, and demonstration (RD&D) activities for fuel separations, transmutation fuel fabrication and advanced waste forms. Although this facility will be owned and operated by DOE, and therefore, not licensed by the NRC, the NRC staff working on the GNEP program will have an open door to observe RD&D activities at the AFCF to allow the NRC to provide DOE early feedback on any regulatory roadblocks related to the CFTC and ABR fuel fabrication.

Following the DOE presentations, more detailed presentations within the various GNEP campaigns were provided by specialists conducting GNEP-related R&D activities at various DOE national laboratories and universities.

Enclosure: Agenda

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