POLICY ISSUE
(Information)

February 9, 2007 SECY-07-0031

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations /RA/

SUBJECT: STATUS OF THE SILEX PROJECT PROPOSED BY GENERAL ELECTRIC NUCLEAR

PURPOSE:

To inform the Commission of the status of a project to be undertaken by General Electric Nuclear (GE) to test and license the Separation of Isotopes by Laser Excitation (SILEX) enrichment technology in the United States (U.S.).

BACKGROUND:

On May 22, 2006, GE announced that it had signed an exclusive agreement with Australia's SILEX Systems Limited, to license the technology and develop the company's next generation low-enriched uranium manufacturing process in the U.S. The SILEX technology uses lasers to separate or enrich the naturally occurring isotopes of uranium.

The agreement provides for a phased approach in the implementation of the SILEX technology, and the potential construction of a test loop and a full-scale commercial enrichment facility.

In a letter dated October 11, 2006, GE informed the Nuclear Regulatory Commission (NRC) of its intentions to license an enrichment facility using the SILEX technology in the U.S. It expects to install a test loop at the Global Nuclear Fuel - Americas (GNF-A) site in Wilmington, North Carolina (NC). This phase would involve laboratory quantities of material to test design

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parameters. GE stated that it intends to submit an amendment request, in February 2007, for anticipated startup of a test loop in November 2007. GE intends to submit a license application for a full-scale enrichment facility as early as December 2007, with approval anticipated in 2009. This is an accelerated version of the schedule presented in a meeting between GE and NRC held at the NRC Headquarters on June 14, 2006.

DISCUSSION:

Test-Loop Amendment

Phase 1 of the project is development of a Test Loop facility at GNF-A, in the existing Fuel Manufacturing Operations Building. The test loop would use no more than 200 kilograms (440 pounds) uranium hexafluoride (UF_6). The small quantities of enriched material contained within the test loop would be reblended with tails, and recycled back into the test loop, for no net enrichment. GE staff projects that the accident scenarios associated with the test loop will be bounded by the current facility safety basis. GE staff believed that this test loop could be licensed by an amendment to the existing 10 CFR Part 70 license because the Wilmington, NC facility is licensed to handle UF_6 in solid, liquid, and gaseous forms.

GE staff confirmed that the test loop equipment will be about half-scale. Design details are not finalized, but the NRC staff stressed to GE that the loop must be configured to ensure that it is for *experimental or analytical purposes only,* as defined in 10 CFR 70.4.

Licensing Process for a Full-Scale Enrichment Facility

Phase 2 of the project is to build a full-scale commercial facility. The location of the full-scale facility has not been selected. GE staff estimated that approximately 250 individual security clearances may be required for the operating staff of a multi-unit facility. GE staff observed that additional security clearances may be required for a dedicated maintenance and support staff.

The NRC staff advised GE representatives that Phase 2 would be considered a uranium enrichment facility, and an Environmental Impact Statement and mandatory hearings, including the opportunity for contested hearings, would be required. The NRC staff also advised GE that an approved license would be required before any construction activities could commence.

IMPLEMENTATION:

Regulatory Framework

The full-scale facility would be licensed under 10 CFR Part 70, “Domestic Licensing of Special Nuclear Material,” and 10 CFR Part 40, “Domestic Licensing of Source Material.” The staff has determined that for the test loop amendment review, the existing guidance in NUREG-1520, “Standard Review Plan for Review of a License Application for a Fuel Cycle Facility,” is sufficient.

For the full-scale license application, a comparison with the draft “Standard Review Plan for the Review of a License Application for the Atomic Vapor Laser Isotope Separation Facility” in NUREG-1701 and

NUREG-1520 will be performed before the end of January 2007. If revised guidance is required, the staff will develop it in support of the license application.

Inspection Framework

The NRC staff has determined that existing and planned inspection procedures and guidance developed for the Mixed-Oxide and Louisiana Energy Services facilities may be used as a framework to develop inspection procedures for both the construction and operation phases of this project.

Security Framework

The SILEX technology is classified up to the Secret Restricted Data level. Access authorization to classified information will be in accordance with 10 CFR Part 25, "Access Authorization for Licensee Personnel." A "Q" clearance and need to know is required. The NRC approves personnel security clearances following a background check.

Protection of Classified Information will be in accordance with 10 CFR Part 95, "Facility Security Clearance and Safeguarding of National Security Information and Restricted Data." Guidance for preparing Standard Practice Procedures Plans for classified information security is available. Transmission of classified matter will be in accordance with 10 CFR Part 95. Related guidance is set forth in the Office of Nuclear Security and Incident Response (NSIR) Division of Security Interim Staff Guidance - 01, "Staff Review Procedure for Transportation Security Plans for Classified Matter Shipments." Information security within the NRC will be in accordance with Management Directive 12.2, "NRC Classified Information Security Program."

SILEX Treaty

In September 2000, the "Administrative Security Arrangements Between the Australian Safeguards and Non-Proliferation Office and the NRC, for the Protection of Classified Information Pursuant to the Agreement for Cooperation between Australia and the U.S., Concerning Technology for the Separation of Isotopes by Laser Excitation," was issued. It was updated in May 2001. These arrangements outline the roles of organizations in both countries. The arrangements also define classification and protective standards by cross-referencing Australian and U.S. clearance levels. Requirements for handling of classified information and equipment are specified. Finally, the arrangements address computer security and destruction of classified material.

Training/Knowledge

Staff has determined that in-house expertise with laser enrichment is limited. Staff has been in contact with the national laboratories regarding general laser safety training, but no contract funds are required for FY 2007. Because of the sensitive nature of the technology, the current plan is to limit the number of staff to a core team of 5 or 6 individuals, who will be trained on a need-to-know basis on specific SILEX technology. Other experienced staff with expertise in general safety disciplines would be utilized for the unclassified aspects of the reviews.

RESOURCES:

In response to the Chairman's request, a Commissioner's Assistant note dated November 2, 2006, provided the following budget estimates. Resource needs are specified for evaluation of the existing regulatory framework, training for a safety review of a new technology, preparation for mandatory or contested hearings, and environmental reviews. Both staffing and contract needs have been identified.

	FY 2007			FY 2008			FY 2009		
	ORG	FTE	Contract $	ORG	FTE	Contract $	ORG	FTE	Contract $
Regulatory Framework	NMSS	0.8		NMSS	0.8				
	NSIR	0.2		NSIR	0.2				
Technical Expertise & Safety Reviews				NMSS	2.0	$250K	NMSS	3. 0	$400K
				FSME	1.0		FSME	2.0	
Project Management	NMSS	0.3		NMSS	2.0		NMSS	2.0	
Hearing Process				NMSS	0.8	$20K	NMSS	1.0	$20K
	OGC	2.6	$3K	OGC	1.5	$2K	OGC	3.35	$6K
Environmental Reviews				NMSS	0.25	$0K	NMSS	0.25	$0K
				FSME	1.25	$500K	FSME	1.25	$300K
Total		3.9	$3K		9.8	$772K		12.55	$726K

Note: FY - Fiscal Year; FTE - full-time equivalent; NMSS - Office of Nuclear Material Safety and Safeguards; NSIR - Office of Nuclear Security and Incident Response and; K - $1000; FSME - Office of Federal and State Materials and Environmental Management Programs; and OGC - Office of the General Counsel.

In preliminary budget development activities, resources for the SILEX project were originally proposed for FY2007 and FY2008, but were later withdrawn due to high uncertainty. Toward the end of FY2006, the possibility of the project became more certain. The test loop phase is expected to be handled as an amendment to the existing license, using resources transferred from other Division of Fuel Cycle Safety and Safeguards (FCSS) activities such as deferral of existing license renewals in the second half of FY2007. We expect the application for the full-scale production facility to be submitted in December 2007. Licensing of a full-scale production facility will require technical and environmental reviews, development of the regulatory infrastructure, and hearing support in FY2008 and FY2009. The agency is currently developing estimates for the FY2009 performance budget. It is during this process that the unbudget resources for FY2008 will be addressed.

COMMITMENTS:

Staff will endeavor to support the review provided that additional resources are available. It is noted that the applicant's proposed schedule has been characterized in the budget as "low uncertainty."

COORDINATION:

FCSS plans to process both the amendment request for the test loop and the license application for the full-scale enrichment facility, using FCSS staff, supported by other Offices, such as NSIR, FSME, and OGC, as required.

NMSS has been coordinating pre-licensing activities with NSIR on security topics such as Foreign Ownership, Control, or Influence reviews, facility clearance development, transportation security plans, and secure computer networks. NMSS has been coordinating with the Office of Administration to manage the personnel security clearance requests received from GE.

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper and has no objections.

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