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Friends of the Earth - Georgia Women's Action for New Directions (WAND) - HEAL Utah
NC Waste Awareness and Reduction Network - Nuclear Age Peace Foundation
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Secretary, U.S. Nuclear Regulatory Commission
ATTN: Rulemakings and Adjudications Staff
Washington, DC 20555-0001

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Subject: Docket ID NRC-2010-0372 and Petition Docket No. PRM-70-9 – Need for Proliferation Assessment in License Applications

To Whom it Concerns:

We are writing in support of the American Physical Society's petition (Docket ID NRC-2010-0372) to change the Nuclear Regulatory Commission's rules to require Nuclear Proliferation Assessments as part of the NRC licensing process.

We support an amendment to regulations at subpart D of 10 CFR part 70, "Domestic Licensing of Special Nuclear Material," Sec. 70.22, to include the following language to be made part of an applicant's license application: *Nuclear Proliferation Assessment. Each applicant for the license of an enrichment or reprocessing facility shall include an assessment of the proliferation risks that construction and operation of the proposed facility might pose. Such an assessment must be prepared in draft form and be required to be reviewed by NRC staff, recognized external experts and members of the public and that public comments be solicited and incorporated into a final version of the assessment.*

New nuclear technologies, such as the proposed GE-Hitachi laser enrichment facility in North Carolina or new reprocessing technologies for which licensing regulations are being developed, could pose unique and substantial proliferation risks. The Atomic Energy Act requires the NRC to deny licenses that would be "inimical to the common defense and security" of the United States. Therefore, the NRC must have the proper basis on which to make licensing determinations and is therefore legally obligated to analyze the proliferation implications of these new technologies within a revised licensing process.

Technologies that are developed by the U.S. are of interest to the rest of the world and it is apparent that the laser isotope technology, if successful, will spread one way or another. It is thus essential that the proliferation assessment be prepared now, rather than waiting to deal

with a situation where the technology may be proliferating due to commercial demands or because of clandestine use.

We urge the NRC to accept the APS petition and apply NRC regulations so as to require a thorough analysis of the proliferation implications in the licensing review of new nuclear technologies related to uranium enrichment, reprocessing and other new technologies.

Concerning the GE-Hitachi Global Laser Enrichment Commercial Facility LLC technology, here are a few points in support of preparation of proliferation assessment as part of the current licensing review of this new uranium enrichment technology.

1. Proliferation Assessment can Aid Safeguards

According to a 2009 paper by the Department of Energy labs entitled *Safeguards-by-Design: Early Integration of Physical Protection and Safeguardability into Design of Nuclear Facilities* (<http://www.inl.gov/technicalpublications/Documents/4384039.pdf>), the objective for institutionalizing the Safeguards-By-Design process "is to provide a procedure by which international and national safeguards, physical security, and other nonproliferation objectives are fully integrated into the overall design and construction process for a nuclear facility, from initial planning throughout design and construction and with benefit to operation; with the goal of increasing the safeguardability, protectability and proliferation resistance of facilities."

It is, in part, through a proliferation assessment prepared on the technology under review that it can be determined if that facility can actually meet higher safeguards standards or if there is something inherent in the technology that makes it harder to safeguard.

As the GEH laser enrichment technology is being developed under the NRC licensing process, there is no formal role of the DOE to make determinations of the sensitivity of the technology. The NRC needs to make sure that a proper assessment of the laser enrichment technology is conducted, with steps taken to make sure that no sensitive information is publicly revealed, and that DOE experts must be consulted in reviewing the proliferation assessment on the GEH facility.

2. Laser Enrichment may be Harder to Detect

That same DOE safeguards paper reports that the laser isotope technology may well be harder to detect than other uranium enrichment technologies. A laser separation facility would use in the range of 10-150 times less per kWh/SWU electricity per than a gaseous diffusion facility and up to 3 times less than a centrifuge facility. Consumption of less electricity could make the facility harder to detect.

A laser enrichment facility may also be harder to detect given its smaller size and different electromagnetic signature.

Laser enrichment must be compared to gaseous diffusion and centrifuge technologies in a proliferation assessment, in order to help determine what new proliferation risks may be presented. The mere fact that GEH has operated a test loop and may move to a larger facility would be a clear signal that the technology works, thus attracting interest in it.

3. Laser enrichment of plutonium or other SNM isotopes?

In the mid-1980s, the U.S. Department of Energy pursued a facility called the Special Isotope Separation (SIS) facility, which was a facility to separate plutonium-239 from other isotopes of plutonium. Pursuit of the technology and the associated Environmental Impact Statement process was canceled but it is unknown if the current laser technology could be adopted to the purification of plutonium.

The SIS technology was based on Atomic Vapor Laser Isotope Separation (AVLIS) to separate plutonium and test facilities included the Engineering Design Facility and the Laser Demonstration Facility at the Lawrence Livermore National Laboratory.

According to the *Profile of World Uranium Enrichment Programs – 2009*, the SILEX (separation of isotopes by laser excitation) technology exported from Australia is being used to separate silicon and zirconium from other materials. By adjustments to the laser process what other kinds of materials can be purified, including Special Nuclear Material (SNM)?

4. Most Sensitive Areas of Technology Need to be Identified

A thorough review of all the technology involved in the laser enrichment project would identify the technologies or components which are most proliferation prone or which would be hardest to acquire by other countries or would-be proliferators. An assessment of which parts of the technology pose the most risk would be a key part of the proliferation assessment. Baselineing the risks gaseous diffusion and centrifuge technology versus laser enrichment would perhaps be one approach to determining if additional risks are posed by laser enrichment technologies.

DOE has determined that a large part of the design and operation of a Uranium-AVLIS facility are deemed to involve Unclassified Controlled Nuclear Information (UCNI) and thus not releasable to the public. (<https://www.osti.gov/opennet/forms.jsp?formurl=document/tg-uav-1/tguav1b.html>) What parts of the laser enrichment process are of a sensitive nature and which parts of the design, even if of a sensitive nature, are most prone to becoming part of the public record? Does the NRC even know which information or technology related to laser enrichment pose the most risk?

In moving from the GEH “test loop” now being tested to the “lead cascade” construction and operation, what additional proliferation risks are presented?

5. Other key questions posed in the Slakey petition need to be answered:

- Could the design of the technology be altered easily to allow for diversion of nuclear material?
- Could the facility be constructed and operated in a manner that is undetectable?
- Are there unique components of the technology whose acquisition would indicate the construction of such a facility and could be easily tracked?

Thank you for your consideration of these comments. We request that they be placed in the pertinent docket and also be posted in ADAMS. If you have any question about these comment, please contact Tom Clements at 803-834-3084.

Sincerely,

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