NUCLEAR PROLIFERATION
PREVENTION PROJECT

March 5, 2021

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attn: Chief, Docketing and Services Branch

DOE/NNSA—Y-12 National Security Complex (Export of 93.20% Enriched Uranium)
(Docket No. 11006398, Lic. Application No. XSNM-3819)

Dear Secretary of the NRC:

Please find enclosed for filing in the above-captioned proceeding the Petition of Alan J. Kuperman for Leave to Intervene and Request for Hearing. Thank you for your service in this matter.

Sincerely,

Alan J. Kuperman, Ph.D.
Associate Professor, LBJ School of Public Affairs
Coordinator, Nuclear Proliferation Prevention Project
University of Texas at Austin

Enclosures
cc: DOE/NNSA
Office of the General Counsel, U.S. Nuclear Regulatory Commission
Executive Secretary, U.S. Department of State

Before the
UNITED STATES NUCLEAR REGULATORY COMMISSION
Washington, D.C. 20555

In the Matter of	)	
	)	
DOE/NNSA	)	Docket No. 11006398
	)	
(Export of 93.20% Enriched Uranium)	)	License No. XSNM 03819
	)	

PETITION OF ALAN J. KUPERMAN
FOR LEAVE TO INTERVENE
AND REQUEST FOR HEARING

Pursuant to Section 189a. of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2239(a), and Section 304(b) of the Nuclear Non-Proliferation Act of 1978, 42 U.S.C. § 2155a. (the "NNPA"), and the applicable rules and regulations of the United States Nuclear Regulatory Commission (the "Commission"), including 10 C.F.R. Part 110, Subparts H and I, Alan J. Kuperman ("Petitioner") hereby respectfully petitions the Commission for leave to intervene as a party in connection with the application of DOE/NNSA ("Applicant"), published in the Federal Register on February 3, 2021 (86 Fed. Reg. 8047), for a license to export 130.0 kilograms (kg) of 93.20% enriched uranium to fabricate

fuel at Framatome in France for ultimate end-use in the High Flux Reactor (RHF) in France.

In addition, Petitioner requests that the Commission order a full and open public hearing at which interested parties may present oral and written testimony concerning the factual and legal issues relevant to the Commission's determinations with respect to the pending license application. Such a hearing would be in the public interest and assist the Commission in making its statutory determinations under the Atomic Energy Act, as provided for by Section 304(b) of the NNPA, 42 U.S.C. § 2155a., and 10 C.F.R. § 110.84.

I. Petitioner's Interests.

Petitioner is Associate Professor at the University of Texas at Austin, where he is also Coordinator of the Nuclear Proliferation Prevention Project (www.NPPP.org). The NPPP's stated mission is to engage in "research, debate, and public education to ensure that civilian applications of nuclear technology do not foster the spread of nuclear weapons to states or terrorist groups." Petitioner has worked professionally since 1987 on nuclear nonproliferation policy in general, and more specifically on minimizing commerce in highly enriched uranium ("HEU").

He is editor and an author of Nuclear Terrorism and Global Security: The Challenge of Phasing out Highly Enriched Uranium (Routledge, 2013, 2014), which analyzes past, present, and potential future efforts to minimize export and use of HEU for non-weapons purposes. He is also author of "Nuclear Nonproliferation via Coercion and Consensus: The Success and Limits of the RERTR Program (1978–2004)," in International Cooperation on WMD Nonproliferation, ed. Jeffrey W. Knopf (Athens, GA: University of Georgia Press, 2016): 46-71, which is the first comprehensive scholarly analysis of U.S. efforts to minimize the type of HEU export at issue in the proposed license – that is, for use as fuel in a research reactor.

In 1992, Petitioner, while working as a staffer in the U.S. Congress, drafted the provision of the U.S. Energy Policy Act of 1992 (the "Schumer Amendment") that upon enactment sharply restricted HEU exports. In 2001, Petitioner authored a petition for leave to intervene by the Nuclear Control Institute, regarding an export license application (XSNM-03192) for HEU for use as fuel in Europe, after which the applicant suspended its application.[1] In 2015, Petitioner submitted a petition for leave to intervene, regarding an export license application (XSNM-03758) for HEU for use as fuel in Europe, after which the applicant withdrew its application.[2] In 2016, Petitioner wrote a letter to the Commission, co-signed by more than two dozen nuclear security experts, regarding an export license application (XSNM-03776) for HEU for use as targets in Europe, after which the Commission reduced by nearly half the amount of HEU approved for export.[3]

Petitioner previously has made invited presentations, regarding export and use of HEU for non-weapons purposes, to the U.S. Nuclear Regulatory Commission, the International Atomic Energy Agency, the U.S. Congress, the Department of Energy (DOE), and the National Academy of Sciences.

Petitioner has important institutional interests that would be directly affected by the outcome of this proceeding. As

noted above, Petitioner is actively involved in public information and education programs concerning nuclear proliferation and nuclear terrorism in general and the use of HEU in particular. Its interest and ability to carry out these functions would be significantly and adversely impaired by the absence of a full and open hearing to facilitate an independent review by the Commission of the issues raised under the Atomic Energy Act and the NNPA by the pending license application.

Petitioner also has individual interests that could be directly affected by the outcome of this proceeding. Export of HEU increases global risks of nuclear proliferation and nuclear terrorism, thereby increasing the likelihood that an adversary's nuclear weapon will be detonated in the United States, adversely affecting the Petitioner's health, safety, and well-being. Petitioner's interests thus have a strong and indisputable nexus to the proposed export of HEU to France.

Petitioner has no other means to protect its interests in this proceeding, and those interests are not now represented by the existing parties. This Petition, moreover, is not interposed for delay or to broaden the proper scope of the proceeding. It is timely filed, within 30 days of the publication of notice of the license application in the Federal Register, as required by 10 C.F.R. § 110.82(c)(1). Finally,

Petitioner submits that its participation will assist the Commission in developing a sound record.

II. Background.

A. HEU and its Risks.

For many years, HEU has been used in the civil sector, including to fuel research and test reactors around the world. However, its risks have likewise long been recognized. There have therefore been substantial efforts to curtail its use by substituting low-enriched uranium ("LEU"), which is not nuclear weapons-usable but is capable of providing the same civilian benefits without significant economic penalty.

The nuclear proliferation and nuclear terrorism risks associated with the circulation of HEU in commerce are well known. HEU was the material used in the Hiroshima bomb (Little Boy). According to the late J. Carson Mark, former head of weapons design at Los Alamos National Laboratory, a "competent group" could build an implosion weapon with as little as about 12 kg of HEU.[4] Consequently, HEU is an attractive target not only for national diversion but also seizure by terrorists. The late Manhattan Project physicist Luis Alvarez once noted, "[W]ith modern weapons-grade uranium ... terrorists, if they had such materials, would have a good chance of setting off a high-

yield explosion, simply by dropping one-half of the material on the other half."[5]

B. The RERTR Program.

In recognition of the dangers associated with continued use of HEU fuel in research reactors, the United States instituted the Reduced Enrichment for Research and Test Reactors (RERTR) program in 1978. Under the leadership of Argonne National Laboratory, this program initiated development of high-density LEU fuels and targets -- material not suitable for fabrication into nuclear weapons but suitable for use in research reactors -- thereby enabling conversion to LEU and much reducing the amount of HEU in commerce.[6]

The results of the RERTR program have been impressive. Around the world, 71 HEU-fueled research reactors have been converted to LEU fuel, and 31 have shut down.[7] Conversion to LEU fuel has been highly successful, according to a recent survey, which reported that reactor "operators overwhelmingly perceived any negative impacts to be outweighed by positive ones."[8]

C. U.S. Policy, Law and Regulation.

U.S. policy has also been strongly in favor of reducing use of HEU. The Commission itself declared as early as 1982 that it

sought to "reduc[e], to the maximum extent possible, the use of HEU in ... foreign research reactors."[9] The same Policy Statement affirmed that "any reduction in the potential for access to these [HEU] inventories would constitute a reduction in the proliferation risk." Domestically, in 1986, the Commission required all licensed research reactors to convert to LEU.[10] In taking this action, the Commission asserted that the "domestic conversions are intended to be put on solid footing by setting a strong, resolute and sensible example, consistent with U.S. national policy, to encourage foreign operators of non-power reactors to convert to the use of LEU fuel."[11] In 1995, consistent with this policy, the U.S. government abandoned plans for a new HEU-fueled research reactor, the Advanced Neutron Source, stating that the bomb-grade fuel presented "a non-proliferation policy concern."[12] In 2004, the U.S. government committed also to convert all DOE research reactors to LEU fuel.[13]

In 1986, Congress first acted specifically to curb the risks associated with commerce in HEU. As enacted, the Omnibus Diplomatic Security and Anti-Terrorism Act calls upon the President, "to take, in concert with United States allies and other countries, such steps as necessary to keep to a minimum the amount of weapons-grade nuclear material in international

transit."[14] The Executive Branch reported that it implemented this statute by limiting HEU exports only to those countries, "which have cooperated closely with the U.S. in the RERTR Program. Exports have further been limited to supply of only those research reactors which either cannot be converted at present to LEU fuel or which need additional HEU fuel while in process of conversion to LEU."[15] Additionally, Section 603 of the 1986 law added a new Section 133 to the Atomic Energy Act, 42 U.S.C. § 2160c., requiring Commission consultation with the Secretary of Defense concerning the adequacy of physical security in connection with any proposed export or transfer of HEU.

Congress again dealt with commerce in HEU in Title IX, Section 903, of the Comprehensive National Energy Policy Act, Pub. L. No. 102-486, 106 Stat. 2944, enacted October 24, 1992 (the "Schumer Amendment"). This added a new Section 134 to the Atomic Energy Act, 42 U.S.C. § 2160d., which limits the circumstances in which any HEU can be exported for use as a fuel or target in a research or test reactor. As the amendment's principal author stated, "[T]his bill codifies once and for all that bomb grade uranium is simply too dangerous to continue indefinitely shipping it overseas for non-military purposes."[16] The Schumer Amendment prohibited export of HEU for use in a

research or test reactor unless all of three conditions were met.[17]

The Commission's regulations fully incorporate the requirements of the Schumer Amendment. They provide that no HEU may be exported unless the Commission determines that:

> (A) There is no alternative nuclear fuel or target enriched to less than 20 percent in the isotope U-235 that can be used in the reactor;
>
> (B) The proposed recipient of the uranium has provided assurances that, whenever an alternative nuclear reactor fuel or target can be used in that reactor, it will use that alternative fuel or target in lieu of highly-enriched uranium; and
>
> (C) The United States Government is actively developing an alternative nuclear reactor fuel or target that can be used in that reactor.[18]

In accordance with 42 U.S.C. § 2160d.(b)(3), the Commission's regulations further define the phrase "can be used" to mean that (A) the fuel or target has been "qualified" by the RERTR program and (B) "Use of the fuel or target will permit the large majority of ongoing and planned experiments and isotope production to be conducted in the reactor without a large percentage increase in the total cost of operating the reactor." 10 C.F.R. § 110.42(a)(9)(ii).

In 2014, the DOE reaffirmed that it "implements the long-

standing U.S policy to minimize and eliminate the use of highly enriched uranium (HEU) in civilian applications by working to convert research and test reactors and isotope production facilities to the use of low enriched uranium (LEU)."[19]

D. Prior U.S. Exports of Excess HEU Have Been Misused in Ways that Undercut U.S. Nonproliferation Policy

Prior exports of excess quantities of HEU have been misused in ways that undercut U.S. nonproliferation policy. For example, in the late-1980s, the Commission authorized export of multi-year quantities of HEU to fuel Germany's THTR reactor (XSNM-2216, XSNM-2285).[20] When that reactor shut down prematurely, it created a surplus of U.S.-origin HEU in Europe. Part of that surplus of U.S.-origin HEU was then used to undercut U.S. nonproliferation policy by being used as fuel for the FRM-II reactor, which the U.S. government had refused to supply with HEU on nonproliferation grounds.[21]

Another more recent example further highlights the danger of excess HEU exports.[22] In the late-1990s, Russia exported a multi-year quantity of HEU to France's CERCA (now Framatome) for use as fuel in the RHF research reactor. However, CERCA misused an estimated 70 kg of that HEU instead to fabricate targets for production of medical isotopes by two European companies, IRE

and Mallinckrodt, which at the time were barred from receiving US exports of HEU because they had refused to convert to LEU. As a result, the operator of the RHF needed to acquire additional HEU to enable continued reactor operation. The operator already had applied for an HEU export from the United States, but upon discovering the misuse of its HEU supply it increased that request by 70 kg. Previously, the reactor operator had requested an export license (XSNM-3633, received by the Commission on 20 December 2010) for 116 kg of HEU for fuel. After the reactor operator discovered the misuse of its HEU by CERCA, it amended its export license application (received by the Commission on 21 October 2011) to increase the requested amount of HEU to 186 kg. There is no other reported explanation for this increase other than CERCA's misuse of the HEU that had been supplied for use as fuel in the RHF.

These examples show that when excess HEU has been exported to Europe, at least twice it has been diverted from the originally stated purpose to end-users who were not eligible for US exports of HEU due to nonproliferation policy restrictions, thereby undercutting U.S. nonproliferation objectives.

E. Applicant Withheld Information Necessary for Statutory Public Participation.

(1) Statutory Provisions.

Pursuant to section 304(b) of the NNPA, the NRC established procedures that allow for "public participation in nuclear export licensing proceedings when the Commission finds that such participation will be in the public interest and will assist the Commission in making the statutory determinations required by the [Atomic Energy Act], including such public hearings and access to information as the Commission deems appropriate."[23]

(2) Public Request for Information Rejected

On February 16, 2021, Petitioner wrote to the Commission requesting three pieces of information regarding the proposed license:[24]

- "When will ILL exhaust its current HEU supply, which presumably is based mainly on the last U.S. license for export of HEU for ILL (XSNM-3757)?"
- "How many years would the proposed export last based on the reactor's planned operating schedule?"
- "By what date is the operator currently expected to complete conversion to LEU fuel?"

On February 18, 2021, the Commission forwarded the request to

the Applicant. On February 25, 2021, the Applicant informed the Commission that it refused to provide any of the requested information, asserting it was "proprietary or other sensitive information."[25] The Commission forwarded this correspondence to the Petitioner on February 25, 2021.

(3) Withheld Information is Neither Proprietary Nor Sensitive.

In October 2016, during the proceeding on the immediately prior export license application by the same Applicant for the same end-user, the Commission publicly provided precisely such information, as follows: "Typically there are four cycles per year, and each cycle requires a single fuel element containing approximately ten kilograms of HEU. The reactor therefore uses about forty kilograms of HEU per year; this proposed export constitutes a three-to-five year supply of HEU ... [C]onversion to low-enriched uranium [is] now expected in the 2027-28 timeframe ... [T]he Institut's current fuel inventory will last only until September 2019 ... Once exported, and after fabrication, this 130 kilograms of HEU would provide enough fuel to allow the High-Flux Reactor to operate until approximately 2023."[26]

In light of the Commission publicly providing this

information in 2016, such information is demonstrably neither propriety nor sensitive. Therefore, in the instant proceeding, the Applicant has provided no legitimate grounds for withholding from the public the information requested by the Petitioner and the Commission, which is necessary for public participation as codified in law and regulation. The information that the Commission publicized in 2016 is now outdated, so the Applicant or Commission must publicly update this information, or the effect would be to vitiate the public participation provisions of the Atomic Energy Act.

F. The RHF Reactor and the Pending Application.

(1) The Reactor.

The HEU at issue in this proceeding is intended to be used as reactor fuel in the RHF research reactor, which has thermal power of 53 to 58 megawatts and is located at the Institut Laue-Langevin (ILL) in Grenoble, France. The primary use of the RHF is neutron scattering experiments supporting applied and fundamental science. A decade ago it was estimated that under normal operation the reactor annually required approximately 40 kg of 93.2%-enriched HEU, representing a maximum usage rate.[27] However, research reactors often undergo planned and unplanned shutdowns, sometimes for extended periods lasting months or

years, so the RHF's average annual usage of HEU is likely below 40 kg, and perhaps substantially so.

The operator, in a 1998 memorandum of understanding with the U.S. government, agreed to study conversion to LEU fuel and to convert, "when it is technically and economically possible," as required under the Schumer Amendment as a condition for interim exports of HEU.[28] Research and development is ongoing toward qualification of LEU-Mo dispersion fuel having uranium density of 8 g/cc, which would enable RHF to convert to LEU fuel without geometric alteration of the core.[29] In addition, the RHF operator and Argonne National Laboratory have studied potential conversion of RHF to LEU silicide fuel, which has lower uranium density than U-Mo dispersion fuel and has been qualified and used in other research reactors for more than three decades. Their 2020 study reports that, "recent experimental success with the silicide fuel system suggest[s] that the silicide fuel commercially available today would certainly be suitable at RHF operating conditions,"[30] although the lower uranium density would require geometric alteration of the reactor core. Thus, the operator has at least two options to convert to LEU fuel: already qualified silicide fuel, or prospective U-Mo dispersion fuel. As noted, in 1998 the operator committed to convert to LEU, "when it is technically and economically possible," and

today there is no evidence of technical or economic obstacle to conversion to silicide LEU fuel immediately or to U-Mo dispersion LEU fuel in the near future.

(2) Proposed Export Is Sufficient for Up to Five Years or More.

In 2016, as noted, the Commission stated that its approved license for export of the same amount of HEU (130 kg) for the same reactor (RHF) as in the instant proceeding, "constitutes a three-to-five year supply of HEU," based on planned operation. There is no evidence that this would not also be true for the proposed export, meaning it comprises a supply of HEU sufficient for up to five years of planned operation. In the event of one or more unplanned shutdowns, the HEU could be sufficient for more than five years.

(3) Proposed HEU Export May Be Excessive.

In 2016, when the Commission approved the export of 130 kg of HEU, it stated that this amount, "would provide enough fuel to allow the High-Flux Reactor to operate until approximately 2023," assuming no unplanned shutdowns that could extend that date. If the proposed export also "constitutes a three-to-five year supply of HEU," it would be sufficient until approximately

2028, assuming no unplanned shutdowns that could extend that date. The Commission also stated in 2016 that the RHF might be able to convert as early as 2027 to LEU-Mo fuel.

Thus, even without unplanned shutdowns, the amount of HEU proposed for export might be more than RHF would require if it were to convert to LEU-Mo fuel in 2027, which the Commission previously had stated was possible. The excess amount of HEU in the proposed export would grow larger in the event of unplanned RHF shutdowns between 2016 and 2027, a contingency having significant probability. The excess HEU would grow still larger if the RHF were converted sooner than 2027 to silicide LEU fuel, which is feasible because such fuel is already qualified and "would certainly be suitable at RHF operating conditions," according to the operator itself.

Thus, in the absence of additional information from the Applicant, which the Applicant has refused to provide, the possibility cannot be ruled out that the proposed license could result in U.S. export of more HEU than the end-user would require prior to being able to convert to LEU fuel, which would violate U.S. law, including the Schumer Amendment, as codified in Commission regulations.

G. Risks of Supplying Excess HEU to Applicant.

Approving export of excess HEU for the RHF reactor would raise at least two serious risks. First, it would reduce the incentive for the operator to convert to LEU fuel as soon as possible, as required by U.S. law and the operator's own commitment. This scenario is not merely hypothetical. In the 1990s, the operator of a research reactor in Germany, the FRJ-2, continued to refuel with HEU and not convert to LEU fuel, even though suitable LEU fuel for the reactor had been qualified for well over a decade. The operator was able to refuse to convert to LEU fuel because it possessed a surplus stock of U.S.-origin HEU.[31] This experience demonstrates clearly that exporting an excess of HEU risks undermining the leverage that the United States has, by virtue of its near monopoly on HEU supply, to persuade operators to convert to LEU fuel.

The second risk of approving export of excess HEU is that it could create a surplus stock of U.S.-origin HEU in Europe that could be used by other nuclear facilities to undermine U.S. non-proliferation policy. For example, the HEU could be sold to an end-user that did not satisfy the requirements for exports of HEU from the United States. This scenario too is not merely hypothetical. As noted, in the 1980s, the Commission approved for export a multi-year supply of HEU to the German THTR

reactor, a unique power reactor that used HEU fuel. When the THTR shut down prematurely, the operator retained several hundred kg of U.S.-origin HEU. Subsequently, a substantial portion of that HEU was sold to the operator of the German FRM-II reactor -- a controversial facility that was the first high-power (greater than one megawatt thermal) research reactor in the western world built to use HEU since establishment of the RERTR program in 1978.[32] The United States refused on nonproliferation grounds to supply this new reactor with HEU,[33] but the reactor operator nevertheless was able to obtain U.S.-origin HEU from the excess that the United States previously had exported for the THTR.

As a result, the FRM-II was able to commence operations with HEU fuel, which threatened to undermine the international nonproliferation norm and the RERTR program. Had it not been for the availability of surplus U.S.-origin HEU in Europe, the United States might well have prevailed on the operator of the FRM-II to convert to LEU prior to start-up. In the same manner, providing excess HEU for the RHF in the instant proceeding could undermine U.S. efforts to persuade other operators to convert their fuel or targets to LEU, and not reconvert to HEU.

Commission has asserted that exporting excess HEU to Europe is not a concern because, "At the 2016 Nuclear Security Summit,

the United States and European Union issued a Joint Statement on HEU Exchange. This Joint Statement significantly enhanced United States-European cooperation efforts so that Europe now has a strong incentive to repatriate any excess or unused HEU back to the United States in the unlikely event of a premature shutdown."[34] In reality, under the U.S.-Euratom nuclear cooperation agreement, European recipients of U.S. HEU exports have advance permission to retransfer excess HEU within Euratom to other end-users, and they are not obligated to repatriate it to the United States.[35]

Thus, approving export of more HEU than the end-user might need before it could convert to LEU fuel raises grave risks of undermining the U.S. nonproliferation objective and policy of phasing out international HEU commerce as quickly as possible. This issue deserves in-depth consideration by the Commission, including a public hearing, prior to any licensing decision.

III. Petitioner's Contentions.

In accordance with Section 53 of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2073, and 110 C.F.R. §§ 110.42(a)(8) and 110.45(a), the Commission may not issue a license for the export of special nuclear material, such as the HEU at issue in this proceeding, unless it determines that

"[t]he proposed export would not be inimical to the common defense and security." Petitioner does not necessarily oppose the granting of the license application for some portion of the HEU sought, assuming that the requisite need can be demonstrated. However, Petitioner submits that at least one issue must be resolved in this proceeding in order to ensure compliance with the Commission's statutory and regulatory obligations:

A. The Commission Must Not Approve Export of HEU in Excess of End-User's Demonstrated Needs.

Petitioner urges the Commission not to approve export of HEU in excess of the end-user's demonstrated needs. Refusing to supply excess HEU for the RHF reactor would be consistent with the Commission's recognition in Transnuclear, Inc., CLI-00-16, 52 NRC 68 (2000), that it is appropriate to take licensing action "as necessary to avoid the potential accumulation of HEU fuel significantly in excess of . . . [a] reactor's needs."

Failure to so limit the export would create unacceptable proliferation and terrorism risks and would undermine the U.S. common defense and security, in at least two ways. First, Commission approval of the entire amount of HEU requested could imply U.S. government consent to use HEU in excess of

demonstrated need, which would exacerbate multiple risks: operators who have not yet converted their reactors to LEU fuel might refuse to do so; operators who have converted might revert to HEU use; and new facilities might be constructed to use HEU. Second, it would lead to unnecessary, increased international transport of nuclear weapons-usable material, aggravating the risk of interception by rogue states, criminals, or terrorists. Such increased risks of nuclear proliferation and nuclear terrorism outweigh any hypothetical benefit to the end-user or others from the proposed export of any amount of HEU in excess of demonstrated need. Especially in light of ongoing U.S. efforts to eliminate HEU stocks globally,[36] exporting more than is needed would be dangerously counter-productive. Certainly, the United States should not help create a situation that could potentially free up more HEU for use in a reactor like the FRM-II, in which it opposes use of HEU fuel.

IV. The Need for a Full Oral Hearing.

A full oral hearing to examine Petitioner's contentions is essential both to serve the public interest and to assist the Commission in making its statutory determinations. Such a hearing would fulfill the Commission's mandate to explore fully the facts and issues raised by export license applications,

where appropriate through full and open public hearings in which (a) all pertinent information and data are made available for public inspection and analysis and (b) the public is afforded a reasonable opportunity to present oral and written testimony on these questions to the Commission. See 42 U.S.C. § 2155a. and 10 C.F.R. §§ 110.40(c), 110.80-110.91, 110.100.[37]

Only a public hearing in which issues related to the ostensible justification for the proposed HEU export are fully aired and subjected to public scrutiny can serve to resolve legitimate public questions concerning both the need for granting this license application and the risks associated with such action. Certainly, the unchallenged assertions of Applicant and/or the Executive Branch are not sufficient to satisfy the public interest in the case.

Petitioner has broad experience and expertise in technical and policy matters directly relevant to the risks and implications of the proposed export. Additionally, Petitioner is fully familiar with all aspects of the RERTR program. Thus, Petitioner would bring to the instant proceeding perspectives that are presently lacking and are pivotal to an understanding and resolution of the factual and legal issues raised by the pending license application.

Specifically, a hearing would bring to light information

that is necessary for informed public participation in the current licensing process, as envisioned by law and regulation. Such information, which thus far has been withheld from the public, includes when ILL will exhaust its current HEU supply based on the reactor's planned operating schedule, the number of years that the proposed export would last based on the reactor's planned operating schedule, and the earliest date that the operator could complete conversion to LEU fuel. A hearing could compel the Applicant to provide such information publicly, enabling informed public participation, which would be in the public interest and assist the Commission in making the required statutory and regulatory determinations,[38] including that "[t]he proposed export would not be inimical to the common defense and security."

V. Relief Requested.

For the reasons set forth above, Petitioner respectfully requests that the Commission:

1. Grant this Petition for Leave to Intervene;

2. Order that an oral hearing be held in connection with the pending license application; and

3. Act to ensure that all pertinent data and information regarding the issues addressed by Petitioner be made available

for public inspection at the earliest possible date.

Respectfully submitted,

Alan J. Kuperman, Ph.D.
Associate Professor, LBJ School of Public Affairs
Coordinator, Nuclear Proliferation Prevention Project
University of Texas at Austin

Dated: March 5, 2021
Austin, TX

ENDNOTES

[1] Ann MacLachlan and Mark Hibbs, "SCK/CEN Asks U.S. to Stop Work on Export Until Status of its HEU Stocks Is Resolved," Nuclear Fuel 26, 23 (November 12, 2001), at 19.

[2] "Belgium Asked U.S. For Weapons-Grade Uranium Before Terror Attack," Daily Caller, March 23, 2016.

[3] Nader L. Mamish, Director of the Office of International Programs, Nuclear Regulatory Commission, letter to Alan Kuperman, et al., August 4, 2017.

[4] Carson Mark, "Some Remarks on Iraq's Possible Nuclear Weapon Capability In Light of Some Known Facts Concerning Nuclear Weapons" (Nuclear Control Institute, May 16, 1991), at 2.

[5] Alvarez, Adventures of a Physicist 125 (Basic Books 1987).

[6] See generally Alan J. Kuperman, "Nuclear Nonproliferation via Coercion and Consensus: The Success and Limits of the RERTR Program (1978-2004)," in International Cooperation on WMD Nonproliferation, ed. Jeffrey W. Knopf (University of Georgia Press, 2016).

[7] Christina Nunez, "The ongoing effort to convert the world's research reactors," American Nuclear Society, July 10, 2020. Alan J. Kuperman, ed., Nuclear Terrorism and Global Security: The Challenge of Phasing out Highly Enriched Uranium (New York: Routledge, 2013). Alan J. Kuperman, "Nuclear Nonproliferation via Coercion and Consensus: The Success and Limits of the RERTR Program (1978-2004)," in International Cooperation on WMD Nonproliferation, ed. Jeffrey W. Knopf (Athens, GA: University

of Georgia Press, 2016): 46-71.

[8] Ferenc Dalnoki-Veress, "Primarily Positive Perceptions: A Survey of Research Reactor Operators on the Benefits and Pitfalls of Converting from HEU to LEU," presented at the European Research Reactor Conference (RRFM 2014), Ljubljana, Slovenia, April 1, 2014.

[9] See 47 Fed. Reg. 37007 (August 24, 1982).

[10] See 51 Fed. Reg. 6514 (February 25, 1986).

[11] Id. at 6516. Commission policy, it should be noted, has reflected the consistent views of the Executive Branch that it is important to U.S. non-proliferation policy to minimize the amount of HEU in international commerce. See Presidential Non-Proliferation Policy Statement of April 7, 1977, 13 Weekly Comp. Pres. Doc. 507 (April 11, 1977); U.S. Nuclear Non-Proliferation and Cooperation Policy (July 16, 1981), 17 Weekly Comp. Pres. Doc. 769 (July 20, 1981); Nonproliferation and Export Control Policy Statement, 29 Weekly Comp. Pres. Doc. 1901 (September 27, 1993).

[12] U.S. Department of Energy, "DOE Facts: A New Neutron Source for the Nation" (February 1995).

[13] U.S. Energy Secretary Spencer Abraham, presentation at the International Atomic Energy Agency, Vienna, Austria, May 26, 2004. See "FACT SHEET: Global Threat Reduction Initiative," 2004, http://www-pub.iaea.org/mtcd/meetings/PDFplus/2004/cn139fact.pdf.

[14] See Omnibus Diplomatic Security and Anti-Terrorism Act of 1986, Pub. L. No. 99-399, Sec. 601(a)(3)(A) (August 27, 1986). Congress had previously passed resolutions supportive of Executive Branch efforts to reduce HEU use. See S.J. Res. 179, 97th Cong., 1st Sess. (July 27, 1981); S. Con. Res. 96, 97th Cong., 2d Sess. (May 27, 1982).

[15] 1991 Annual Report Under Section 601 of the NNPA, 22 U.S.C. § 3281 (July 2, 1992), at 77.

[16] 138 Cong. Rec. H. 11440 (daily ed., Oct. 5, 1992).

[17] 42 U.S.C. § 2160d.(a)(1)-(3).

[18] 10 C.F.R. § 110.42(a)(9)(i).

[19] U.S. Department of Energy, "GTRI's Convert Program: Minimizing the Use of Highly Enriched Uranium," Fact Sheet, May 29, 2014.

[20] "NRC Report to Congress on the Disposition of Highly Enriched Uranium Previously Exported from the United States," January 1993, at Appendix I-9, indicates that these two licenses authorized export of 439 kg of HEU.

[21] Ann MacLachlan and Mark Hibbs, "French-Russian HEU Accord

Signed; EC Agreed To Russian Prior Consent," Nuclear Fuel, 21, 13 (June 17, 1996), at 1, reports that "FRM-2 has been the target of intensive efforts by U.S. RERTR program officials who seek to have it redesigned to burn low-enriched uranium. . . . The future operator of the reactor . . . has secured a 10-year forward fuel supply, or about 400 kg of HEU. So far, according to European industry sources, they have secured half that amount from HEU stocks originally destined for Germany's scuttled THTR-300 high-temperature gas-cooled reactor at Hamm-Uentrop."

[22] Alan J. Kuperman, "Quadripartite Agreement," in Nuclear Terrorism and Global Security: The Challenge of Phasing out Highly Enriched Uranium, ed. Alan J. Kuperman (New York: Routledge, 2013), at 92-94.

[23] U.S. Nuclear Regulatory Commission, "Memorandum and Order," CLI-16-15, October 5, 2016, at 4, emphasis added.

[24] Alan J. Kuperman, email to Janice Owens, et al., February 16, 2021.

[25] Christopher Landers, email to Janice Owens, February 25, 2021.

[26] U.S. Nuclear Regulatory Commission, "Memorandum and Order," CLI-16-15, October 5, 2016, at 2-3.

[27] Margarita Jimenez, "USA and Europe: High-Power Research Reactors," in Nuclear Terrorism and Global Security: The Challenge of Phasing out Highly Enriched Uranium, ed. Alan J. Kuperman (New York: Routledge, 2013), at 57.

[28] Ann MacLachlan, "U.S. May Resume HEU Fuel Supply as France's ILL Studies Conversion," Nuclear Fuel, Vol. 23, No. 24 (November 30, 1998), at 3.

[29] A. Bergeron, A. Tentner, J.G. Stevens, "Feasibility Analyses for HEU to LEU Fuel Conversion of the Laue-Langevin Institute (ILL) High Flux Reactor (RHF)", Argonne National Laboratory, ANL/RERTR/TM-10/21, 2010.

[30] A. Bergeron, "RHF Conversion Analysis: Feasibility of Silicide Fuel in an Unconstrained Geometry," European Research Reactor Conference 2020, Online, October 12-15, 2020.

[31] Discussions on conversion of the FRJ-2 reactor to LEU fuel were initiated in 1984 between the operator, German authorities, and the RERTR program, and a schedule for conversion was established as early as 1987. However, in the mid-1980s, the operator acquired sufficient U.S.-origin HEU from surplus stocks in Europe to continue operating without conversion until it shut down in 2006. Thus, the existence of surplus overseas stocks of U.S.-origin HEU unnecessarily hindered conversion to LEU fuel

and perpetuated risky international commerce in HEU for nearly two decades. See Alan J. Kuperman, "Nuclear Nonproliferation via Coercion and Consensus: The Success and Limits of the RERTR Program (1978-2004)," in International Cooperation on WMD Nonproliferation, ed. Jeffrey W. Knopf (University of Georgia Press, 2016), at 54.

[32] See A. Cowell, "Germans Rebuff U.S. on Plans for Nuclear Research Reactor," New York Times, July 22, 1995, at 3, col. 1.

[33] The U.S. State Department stated in 1994, "In accordance with USG policy, reinforced by the 1992 Energy Policy Act, the United States will not supply highly-enriched uranium (HEU) for any new foreign research reactor, such as the Garching facility [the FRM-II] that may be built at the University of Munich." U.S. Department of State, EUR (Voluntary) Press Guidance, "Germany: Garching Research Reactor" (May 10, 1994).

[34] U.S. Nuclear Regulatory Commission, "Memorandum and Order," CLI-16-15, October 5, 2016, at 15.

[35] "Agreement for cooperation in the peaceful uses of nuclear energy between the European Atomic Energy Community and the United States of America," November 7, 1995. Under this Agreement, the movement of U.S.-origin materials from one country to another within EURATOM is not subject to any prior U.S. consent on "retransfers" under Sections 123a.(5) and 127(4) of the Atomic Energy Act, 42 U.S.C. §§ 2153a.(5), 2156(4). See H.R. Rep. No. 138, 104th Cong., 1st Sess. 101 (November 29, 1995); Transnuclear, Inc., CLI-00-16, 52 NRC 68 (2000).

[36] "GTRI: Removing Vulnerable Civilian Nuclear and Radiological Material," Fact Sheet, April 12, 2013, https://www.hsdl.org/?view&did=734935.

[37] The Commission's regulations, it should be noted, include specific recognition that public participation and input are encouraged. 10 C.F.R. § 110.81(a).

[38] U.S. Nuclear Regulatory Commission, "Memorandum and Order," CLI-16-15, October 5, 2016, at 7-8.