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U.S. Policy and Implications on Civilian Nuclear Material and Component Exports

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Abstract

The U.S. Nuclear Regulatory Commission (NRC) is responsible for licensing exports of nuclear materials, facilities, and equipment to ensure these items are used only for peaceful purposes. While the NRC is an independent regulatory agency within the U.S. Government, the U.S. Department of State and other Executive Branch agencies have foreign policy interests that have implications for the NRC's export licensing role. The Atomic Energy Act of 1954, as amended, gives the NRC its statutory authority for export licensing, and the Nuclear Non-Proliferation Act of 1978 enhanced U.S. nuclear export controls. Each of these laws require coordination and consultation between the NRC and Executive Branch agencies on export issues. As a result, U.S. Government foreign policy actions can have an influence on the NRC's export licensing regime. Such policy actions may include Presidential Executive Orders and Executive Branch recommendations to the NRC. This paper uses case studies to examine how the NRC balances implementation of its statutory obligations for export control with foreign policy objectives that evolve with a changing world, while still maintaining regulatory independence.

Purpose

This paper examines a select number of key policy issues involving Presidential Executive Orders, foreign policy considerations, Executive Branch recommendations, Congressional legislation, and internal NRC policy to evaluate the singular and integrated impact on the NRC's independent export licensing process. Public involvement in the NRC's activities is a cornerstone of strong and fair regulation of the nuclear export community. It is through this involvement and interactions with the NRC that policy issues need to be effectively and efficiently implemented.

Background

a. Legal Requirements for Exports

Under the Atomic Energy Act (AEA) of 1954, as amended, the U.S. Nuclear Regulatory Commission (NRC) is responsible for licensing exports and imports of nuclear materials, facilities, and equipment to ensure these items are used only for peaceful purposes. This authority extends to production and utilization facilities, to special nuclear, source and byproduct materials, to certain nuclear facility components, and to certain other materials, including nuclear grade graphite and deuterium. The legal basis starts with the *Atomic Energy Act of 1954*. Two specific sections, 126 and 127 of the Act authorize and provide the framework for NRC's import and export licensing. Specifically, Section 126 requires Executive Branch Views on certain exports and Section 127 identifies certain non-proliferation criteria for an acceptable export. Examples of some non-proliferation criteria in the AEA are IAEA safeguards at the facility in receipt of the nuclear material, the existence of adequate physical security measures at the facility in receipt, and no-retransfer without prior consent). *The Nuclear Non-Proliferation Act of 1978* established criteria governing licensing of exports and strengthening the international safeguards system to limit the spread of nuclear weapons. *The Nuclear Non-Proliferation Treaty* in part, placed elements in place to prevent the spread of nuclear weapons to non-nuclear weapon states and promoted peaceful uses of nuclear energy.

NRC's regulations in 10 Code of Federal Regulations (CFR) Part 110 apply to all individuals in the United States who export and import nuclear equipment and material under NRC licensing authority. Unless the export or import transaction falls in one of the specific exception categories identified in 10 CFR 110.1(b) (1)-(6), it must be authorized by an appropriate NRC license. NRC issues two types of export and import licenses: general and specific. The Office of International Programs (OIP) at the U.S. NRC is responsible for making licensing decisions on exports and imports of nuclear materials, facilities, and equipment.

b. Overview of Export Licensing Criteria

Over 46 years, NRC's export/import licensing program has evolved into a mature program with formal internal and interagency procedures for processing cases. Each type of export or import subject to the NRC's licensing authority must meet specific licensing criteria set forth in sections 10 CFR 110.42 and 110.43 before the NRC may grant an export or import license. The goal of the licensing criterion is to allow for legitimate civil nuclear trade while also ensuring the principles of nonproliferation are met both domestically, and the end use of abroad of the material and/or nuclear equipment.

Most but not all specific license nuclear material exports require Executive branch views. The Executive Branch consists of the Departments of State, Energy, Defense, and Commerce. The Department of State coordinates interagency reviews of NRC export license applications. The Department of Energy is responsible for reviewing and processing "subsequent arrangements" when recipients of U.S. nuclear materials, are required to seek prior consent from the U.S. government to retransfer or alter the form or content of such material or equipment. The Department of Commerce performs industry analysis, advocacy with foreign partners and has jurisdiction of exports of *dual use* as listed on the Commerce Control List. According to the Export Administration Regulations (EAR), part 730.3, "a 'dual use' item is one that has civil applications as well as terrorism and military or weapons of mass destruction (WMD)-related applications."

Types and Examples of Policy Cases Impacting Export Licensing Process

a. Presidential Executive Orders and Foreign Policy

Pakistan Orders Prohibiting General Licenses of Byproduct Material

On April 21, 2020, The U.S. Nuclear Regulatory Commission (NRC) issued an Order suspending the 10 CFR part 110 general license authorizing exports of byproduct material to Pakistan. Exporters now must apply for a specific license for exports of byproduct material to Pakistan pursuant to NRC regulations. The Executive Branch determined that suspending byproduct material exports to Pakistan under this 10 CFR part 110 general license is necessary to enhance the common defense and security of the United States and is consistent with the provisions of the Atomic Energy Act, as amended. For this reason, the Executive Branch recommended that the NRC suspend the general license authority in 10 CFR 110.23 for any exports of byproduct material to Pakistan. NRC did not process any changes to 10 CFR 110 for this Order. <https://www.federalregister.gov/documents/2020/04/21/2020-08412/order-suspending-general-license-authority-to-export-byproduct-material-to-pakistan>

China Export Policy

On October 11, 2018, the U.S. Government announced new measures to prevent China's illegal diversion of U.S. civil nuclear technology for military or other unauthorized purposes, and to protect U.S. nuclear energy technology. Following the announcement of the new policy, the NRC actively supported the Executive Branch in outreach activities to NRC license holders, applicants, and other non-government organizations. The policy framework applied to all civilian nuclear export licensing authorities (Nuclear Regulatory Commission, Department of Energy, and Department of Commerce). The new policy established a framework for the executive branch's review and disposition of pending NRC export license applications to China (<https://www.nrc.gov/about-nrc/ip/export-import.html>).

The China Export Policy did not impact NRC authority, regulations (10 CFR 110) or licensing process. However, implementation of the policy required NRC to add special conditions to export licenses requiring license amendments to add new intermediate consignees.

Executive Order of February 25, 2011, "Blocking Property and Prohibiting Certain Transactions Related to Libya"

On March 24, 2011, the Executive Branch informed the NRC of Presidential Executive Order, "Blocking Property and Prohibiting Certain Transactions related to Libya". The Executive order prohibited any exports by U.S. persons to Libya of items in which the Government of Libya or a person designated under the Executive Order has an interest, unless authorized by the Office of Foreign Assets Control (OFAC) of the Department of Treasury. The Executive Branch recommended that the NRC suspend any existing specific licenses to the extent they license exports to Libya and take the necessary action to suspend general license authorizations for exports to Libya.

The NRC did not change regulations in 10 CFR 110, but rather issued Two Orders suspending licenses to GE Hitachi Nuclear Energy, LLC Vallecitos Nuclear Center, and to Weatherford International Inc. On November 23, 2012, NRC rescinded the Orders based on the suspension of the Executive Order.

Executive Order 12769

The President issued Executive Order 12769 on July 10, 1991, which among other things, terminated the prohibition on nuclear trade with South Africa in section 309 and 311 of the *Comprehensive Anti-Apartheid Act of 1986*. The NRC reinstated the pre-1986 formulation of its regulations in 10 CFR 110.27 to permit a person to import byproduct material or unirradiated source or special nuclear material including uranium ore and uranium oxide from any country including South Africa, under a general license if the consignee in the United States is authorized to possess the material.

Reprocessing

During the 1976 presidential election campaign, critics raised concerns over the acquisition of plutonium from civilian nuclear power programs, the proliferation of nuclear weapons, and controls over exporting nuclear technology. In response to these concerns, and just prior to the 1976 election, President Ford announced a major decision by the U.S. government calling for a temporary halt to reprocessing that was aimed at stopping the proliferation of nuclear weapons capability. In 1977, the Carter Administration extended the moratorium into a long-term policy to defer indefinitely the commercial reprocessing and recycling of plutonium produced in U.S. nuclear power plants. Because of this decision, approximately 97% of the recoverable uranium and plutonium from spent nuclear fuel became nonrecoverable waste products. In October 1981, President Reagan lifted the indefinite ban on U.S. commercial reprocessing activities. By 1993, President Clinton had reaffirmed the U.S. deferral policy that discouraged reprocessing and research. This deferral policy did not result in any regulatory changes to NRC's export regulations found in 10 CFR 110 Appendix I, "Illustrative List of reprocessing Plant Components Under NRC Export Licensing Authority".

b. Executive Branch Direction

Embargoed and Restricted Destinations

The Executive Branch, considering current foreign policy considerations, designates certain countries as "embargoed" or "restricted" destinations as identified in 10 CFR 110.28 and 110.29 respectively. Restricted destinations are countries that may receive exports of certain materials and quantities under a general license, but some exports to restricted destinations will require issuance of a specific license including Executive Branch review. Embargoed destinations may not receive any exports of nuclear material or equipment under an NRC general license. Exports to embargoed countries must be pursuant to a specific license and require Executive Branch review and NRC Commission level approval.

The number of restricted destinations has substantially changed since the 1980s. In 1984, there were 42 restricted destinations listed in 10 CFR 110: whereas as of May 6, 2019 the regulations list 10 nations.

Since 1984, the number of countries identified as embargoed increased from four to six. In 1984, the regulations in 10 CFR 110 identified four countries as embargoed: Cuba, Kampuchea (now Cambodia), North Korea, and Vietnam. Today, as of May 6, 2019, regulations in 10 CFR 110.28 list Cuba, North Korea, Sudan, Iraq, Syria, and Iran.

Trigger List Compatibility

In the 1970s, the Zangger Committee developed a list of controlled items and disseminated this information to International Atomic Energy Agency (IAEA) Member States through INFCIRC/209. This information circular was dubbed the "Trigger List," as each item listed "triggered" the need for safeguards. Following the 1974 India's nuclear explosive test, a group of nations, originally known as the London Club and later the Nuclear Suppliers Group (NSG), developed a more comprehensive list of export controls to complement Article III.2 of the NPT. The NSG modeled its guidelines after the Zangger Committee's "Trigger List,"

but expanded the scope to include limits on plants and equipment for the reprocessing, enrichment, and conversion of nuclear material, and for fuel fabrication and heavy water production. In 1978, the Commission and the Executive Branch decided that NRC's licensing authority would essentially parallel the Trigger List, and furthermore, NRC regulations in 10 CFR 110.30, "Members of the Nuclear Suppliers Group," enabled an expanded list of nuclear material and components that could be exported under a general license. Three distinct rulemaking activities have adjusted NRC requirements to conform to the Trigger List in 1990 (55FRN30449); 1996 (61FRN3560); 2000 (65FRN70289); and 2014 (79FRN39289). The NSG Part 1 Guidelines – the Trigger List – is reproduced in 14 appendices to NRC's export regulations at 10 CFR Part 110. These are "illustrative" lists – NRC can exert control over additional commodities consistent with its statutory authority by incorporating the "especially designed or prepared for" concept in the regulations

Generic Assurances

Generic Assurances requests are made through diplomatic channels by the Department of State, either in exchanges of diplomatic notes or government-to-government letters. The use of generic assurances conforms to the Non-Proliferation Act of 1978 with respect to confirming the reliability of the U.S. as a supplier of nuclear equipment and material to countries which adhere to effective nonproliferation policies. If an export or import is not covered by the NRC's general license, as described in 10 CFR Part 110.21 through 110.27, a person must file an application with the NRC for a specific export license in accordance with 10 CFR 110.31 and 110.32. In addition to other prerequisites, the NRC meets export licensing criteria for specific licenses by requesting government-to-government assurances. The Executive Branch uses two procedures to facilitate such transactions: case-specific government-to-government assurances; and generic government to government assurances.

Case-specific are the most common form of assurances for export license applications. However, due to the volume of requests, the repetitive nature of requests and the low proliferation risk of the proposed export, generic assurances can be applied to certain items proposed for export.

Exports of minor reactor components listed in 10 CFR 110, Appendix A, items 5-11, or any component especially designed or prepared for use in a nuclear reactor or deuterium or nuclear grade graphite for nuclear end use are all eligible for generic assurances. Generic assurances confirm: U.S. Government must obtain assurances from recipient government of IAEA full-scope safeguards will be applied in Non-Nuclear Weapons States (NNWS); no nuclear explosive use or research and development on a nuclear device, and no retransfer without prior government consent, then the NRC must determine that the proposed export is not inimical to the common defense and security of the U.S. supported the final licensing decision to issue the license.

c. NRC Policy Issues

NRC policy issues are those changes in the export licensing framework that are initiated internally at the NRC based upon either requests from license holders or NRC's experience

in implementation of the licensing process. In all cases, the Executive Branch must concur on the proposals by the NRC.

Life of Reactor Fuel Supply

In May 2019, the NRC Commission approved the NRC staff's recommendation that any future applications for long-term life-of-reactor or continuity of supply fuel exports to other countries be provided to the Commission for review and approval in accordance with 10 CFR §110.40 (c) for the initial requests only.

General License

On December 3, 1984, the NRC amended regulations pertaining to the export and import of nuclear equipment and material. The amended regulations expanded the authority to export non sensitive nuclear equipment and minor quantities of nuclear material without applying for and obtaining a specific NRC license. The amended regulations were intended to reduce the total number of required licensing actions without affecting the Commission's rigorous controls over the export of proliferation-sensitive nuclear commodities. The new and revised general licenses incorporated for the first time in NRC's regulations the U.S. government's policy of facilitating nuclear cooperation with countries sharing U.S. nonproliferation commitments.

A general license is a type of license issued through rulemaking in 10 CFR 110 by the NRC and is not an exemption from the requirements. However, general license does not relieve a person from complying with other applicable NRC, Federal, and State requirements. Furthermore, the issuance of general licenses was viewed as a way to underscore the reliability of the U.S. as a supplier of nuclear equipment and material to countries demonstrating strong commitments to nonproliferation policies.

d. U.S. Congressional Legislation

Consolidated Appropriations Act of 2018

Under the Omnibus Budget Reconciliation Act of 1990 (OBRA), as amended, the NRC is required to recover most of its budget authority by collecting fees for the licensing and regulatory functions it performs under the Atomic Energy Act of 1954, as amended. Licensing fees for applicants or holders of specific export/import licenses issued pursuant to 10 CFR Part 110 are based on the level of review (approximate amount of time) required and, if necessary, the interaction with other government agencies depending on the type of license or amendment requested. The NRC charges a flat fee to review and process applications for specific export, import, amendment or renewal licenses and requests for exemptions from the licensing requirements. The fee is derived from one of five flat fee categories and is commensurate with the average level of effort or number of hours spent by NRC staff to review and process a type application. The actual fees charged by the NRC to review applications for a specific NRC export or import license are set forth in 10 CFR 170.21 for facilities and equipment and 170.31 for nuclear materials.

Based upon the Consolidated Appropriations Act of 2018, certain portions of the NRC total budget were excluded from NRC's fee-recovery amount including 16.2 million for international activities from the fee-recoverable budget. Because the enacted budget excludes international activities from the fee-recoverable budget, import and export licensing actions, wholly funded through the international activities' product line. Thus, fee categories within 10 CFR 170.21 and 10 CFR 170.31 will not be charged a fee. The NRC alerted all export applicants and licensees of the 2018 final fee rule in the Federal Register which states that beginning August 24, 2018, the NRC will no longer charge fees to process applications for specific export and import licenses. This change in policy is still in effect for FY 2021.

Energy Policy Act of 2005

The Energy Policy Act (EPA) of 2005 was signed into law on August 8, 2005. Sections 630, 651 (d), and 651(e), required NRC to modify regulations in 10 CFR 110 to required that exports of high enriched uranium for medical isotope production in reactors that are either utilizing low enriched uranium (LEU) fuel or have agreed to convert to the use of LEU fuel. Additional regulation changes included addition of radium-226 to byproduct material consistent with the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources*. The Commission had already approved final regulations amending 10 CFR 110 for the Code of Conduct; however, the Commission at the time did not have the authority to regulation radium-226. The final regulation change was to place accelerator-produced material, discrete sources of radium-226, and certain discrete sources of naturally-occurring radioactive material other than source material under NRC authority if produced, extracted, or converted for use in commercial, medical or research activities. The regulations went into effect on August 7, 2006.

Energy Policy Act of 1992

The Nuclear Regulatory Commission (NRC) amended its regulations pertaining to the export and import of nuclear equipment and material to implement section 903 of the Energy Policy Act of 1992. The rule enhanced NRC regulations to include the criteria for the export of high-enriched uranium specified in the Energy Policy Act. The Act required three conditions to be met to issue an export license for high-enriched uranium as a fuel or as a target in the research test reactor. The conditions are: (1) There is no alternative nuclear reactor fuel or target enriched in the isotope 235 to a lesser percent than the proposed export, that can be used in that reactor; (2) The proposed recipient of that uranium has provided assurances that, whenever an alternative nuclear reactor fuel or target can be used in that reactor, it will use that alternative in lieu of highly enriched uranium; and (3) The United States Government is actively developing an alternative nuclear reactor fuel or target that can be used in that reactor.

Summary and Conclusions

The export licensing process continues today as it did over 46 years ago to effectively implement U.S. nonproliferation policy objectives by demonstrating abroad the advantages of supporting effective nonproliferation policies. Furthermore, the acceptance of generic

assurances and the issuance of general licenses are examples of efforts to underscore the reliability of the U.S. as a supplier of nuclear equipment and material to countries demonstrating strong commitments to nonproliferation policies.

Public involvement in the NRC's activities is a cornerstone of strong and fair regulation of the nuclear export community. It is through this involvement and interactions with the NRC that policy issues continue to be consistently and effectively implemented. Many policy decisions have enhanced and increased the efficiency of the NRC's export licensing process.

Though not comprehensive, I have presented key examples of how Presidential Executive Orders, foreign policy considerations, Executive Branch direction, U.S. legislation, and internal NRC policy considerations that have affected NRC's export licensing process. It is important to note that not all policy issues result in rulemaking to amend 10 CFR 110, and for internal NRC policy issues the Executive Branch must concur on proposed actions.

As examined below, some notable enhancements and efficiency within the export licensing process from past policy decisions include:

- Acceptance of generic peaceful use assurances reduces case-by-case interactions with foreign governments to obtain such assurances, decreases NRC's licensing officer's workload by allowing the use of certain general license authorizations.
- Elimination of export or import application fees
- Expanded the authority to export non-sensitive nuclear equipment and minor quantities of nuclear material without applying for and obtaining a specific NRC license.
- Ability to grant long-term life-of-reactor or continuity of fuel supply export license authorizations.

Past policy decisions have also resulted in increased controls within the export licensing process such as:

- The increase in the number of embargoed countries has reduced NRC general license authorizations for exports of certain nuclear materials and equipment to certain countries
- High enriched uranium for medical isotope production can only be approved for export to reactors that are either utilizing low enriched uranium fuel or have agreed to convert to the use of LEU fuel.
- A framework has been established for the disposition of pending NRC license applications for exports to China.
- Amendments to 10 CFR 110 are necessary to maintain consistency with the Nuclear Suppliers Group guidelines.

References

1. <https://www.nrc.gov/about-nrc/ip/export-import.html>
2. <https://www.nrc.gov/reading-rm/doc-collections/cfr/part110/>
3. <https://www.nrc.gov/reading-rm/doc.../cfr/.../part110-0026.html>
4. <https://www.masterresource.org/energy-policy/spent-nuke-fuel-policy-5/>
5. ADAMS Accession Number ML12244A021, "Rescission of Order Suspending Licenses Authorizing Exports to Libya
6. William J. Dircks, Executive Director for Operations to Commissioner Bradford, Re-Analysis of Section 109 Component Parts and Other Items or Substances Especially Significant for Nuclear Explosive Purposes (April 23, 1981)
7. 49 Federal Register 47191, December 3, 1984
8. 71 Federal Register 20336 April 20, 2006
9. 56 Federal Register 38335, August 13, 1991
10. 58 Federal Register 57962, October 28, 1993
11. 83 Federal Register 29622, June 25, 2018
12. 45 Federal Register 51184, August 1, 1980