THE EFFECT OF IMPORTS OF URANIUM ON THE NATIONAL SECURITY

AN INVESTIGATION CONDUCTED UNDER SECTION 232 OF THE TRADE EXPANSION ACT OF 1962, AS AMENDED

U.S. Department of Commerce
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TABLE OF CONTENTS

I. Executive Summary 4

II. Legal Framework 29

A. Section 232 Requirements 29

B. Discussion 32

III. Investigation Process 38

A. Initiation of Investigation 38

B. Public Comments 39

C. Site Visits and Information Gathering Activities 42

D. Interagency Consultation 42

E. Review of the Department of Commerce 1989 Section 232 Investigation on Uranium Imports 43

IV. Product Scope of the Investigation 44

V. Background on the U.S. Nuclear Industry 47

A. Summary of the U.S. Uranium Fuel Cycle 47

B. Summary of U.S. Nuclear Power Generation Industry 55

VI. Global Uranium Market Conditions 61

A. Summary of the Global Uranium Market 61

B. Uranium Transactions: Book Transfers and Flag Swaps 65

C. The Effect of the Fukushima Daiichi Incident on U.S. and Global Uranium Demand 71

D. The Effect of State-Owned Enterprises on Global Uranium Supply 73

VII. Findings 82

A. Uranium is Important to U.S. National Security 82

1. Uranium is Needed for National Defense Systems 82

2. Uranium is Required for Critical Infrastructure 90

B. Imports of Uranium in Such Quantities as are Presently Found Adversely Impact the Economic Welfare of the U.S. Uranium Industry 99

1. U.S. Utilities' Reliance on Imports of Uranium in 1989 99

2. U.S. Utilities' Reliance on Imports of Uranium Continue to Rise 100

3. High Import to Export Ratio 105

4. Uranium Prices 106
5. Declining Employment Trends 112
6. Loss of Domestic Long Term Contracts Due to Imported Uranium 121
7. Financial Distress 123
8. Research and Development Expenditures 138
9. Capital Expenditures 141
C. Trade Actions: Anti-Dumping and Countervailing Duties 144
D. Displacement of Domestic Uranium by Excessive Quantities of Imports has the Serious Effect of Weakening Our Internal Economy 147
1. U.S. Production is Well below Demand and Utilization Rates are Well Below Economically Viable Levels 147
2. Domestic Uranium Production is Severely Weakened and Concentrated 152
3. Reduction of Uranium Production Facilities Limits Capacity Available 153
E. Uranium Market Distortion by State-Owned Enterprises is a Circumstance that Contributes to the Weakening of the Domestic Economy 157
1. Excess Russian, Kazakh, and Uzbek Production Adversely Affects Global Markets and Creates a Dangerous U.S. Dependence on Uranium from These Countries 157
2. The increasing presence of China in the global uranium market will further weaken U.S. and other market uranium producers 165
3. Increasing global excess uranium production will further weaken the internal economy as U.S. uranium producers will face increasing import competition. 167
VIII. Conclusion 169
A. Determination 169
B. Economic Impact of 25 Percent U.S.-Origin Requirement 183
C. Public Policy Proposals 191

APPENDICES

APPENDIX A: Section 232 Investigation Notification Letter to Secretary of Defense James Mattis, July 18, 2018

APPENDIX B: Federal Register Notices – Notice of Requests for Public Comments on Section 232 National Security Investigation of Imports of Uranium, July 25, 2018; Change in Comment Deadline for Section 232 National Security Investigation of Imports of Uranium, September 10, 2018

APPENDIX C: Summary of Public Comments

APPENDIX D: Survey for Data Collection (Front-End Uranium Industry)

APPENDIX E: Survey for Data Collection (Nuclear Electric Power Generation Industry)

APPENDIX F: Uranium Product Specific Trade Flows

APPENDIX G: Summary of Commerce Department 1989 Section 232 Uranium Investigation

APPENDIX H: The National Security Aspect of U.S. Uranium Industry Regulation

APPENDIX I: The Role of State Owned Enterprises in the Global Uranium Market

APPENDIX J. U.S. Naval and Nuclear Weapons Uses of Uranium

APPENDIX K: Glossary

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I. Executive Summary

This report summarizes the findings of an investigation conducted by the U.S. Department of Commerce (the "Department") pursuant to Section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. §1862 ("Section 232")), into the effect of imports of uranium[1] on the national security of the United States.

In conducting this investigation, the Secretary of Commerce (the "Secretary") noted the Department's prior investigations under Section 232. This report incorporates the statutory analysis from the Department's 2018 reports on the imports of steel and aluminum[2] with respect to applying the terms "national defense" and "national security" in a manner that is consistent with the statute and legislative intent.[3]

As required by the statute, the Secretary considered all factors set forth in Section 232(d). In particular, the Secretary examined the effect of imports on national security requirements, specifically:

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[1] *See* Figure 1 in Section IV, "Product Scope of the Investigation," for the uranium products addressed by this report.

[2] U.S. Department of Commerce. Bureau of Industry and Security. *The Effect of Imports of Steel on the National Security (*Washington, DC: 2018) ("Steel Report") and U.S. Department of Commerce. Bureau of Industry and Security. *The Effect of Imports of Aluminum on the National Security (*Washington, DC: 2018) ("Aluminum Report").

https://www.bis.doc.gov/index.php/documents/steel/2224-the-effect-of-imports-of-steel-on-the-national-security-with-redactions-20180111/file

https://www.bis.doc.gov/index.php/documents/aluminum/2223-the-effect-of-imports-of-aluminum-on-the-national-security-with-redactions-20180117/file

[3] Steel Report at 13-14; Aluminum Report at 12-13.

i. domestic production needed for projected national defense requirements;

ii. the capacity of domestic industries to meet such requirements;

iii. existing and anticipated availabilities of the human resources, products, raw materials, and other supplies and services essential to the national defense;

iv. the requirements of growth of such industries and such supplies and services including the investment, exploration, and development necessary to assure such growth; and

v. the importation of goods in terms of their quantities, availabilities, character, and use as those affect such industries; and the capacity of the United States to meet national security requirements.

The Secretary also recognized the close relation of the economic welfare of the United States to its national security. Factors that can compromise the nation's economic welfare include, but are not limited to, the impact of "foreign competition on the economic welfare of individual domestic industries; and any substantial unemployment, decrease in revenues of government, loss of skills, or any other serious effects resulting from the displacement of any domestic products by excessive imports." 19 U.S.C. § 1862(d). In particular, this report assesses whether uranium is being imported "in such quantities" and "under such circumstances" as to "threaten to impair the national security."[4]

[4] 19 U.S.C. § 1862(b)(3)(A).

Findings

In conducting the investigation, the Secretary found:

A. Domestic uranium production is essential to U.S. national security.[5]

1. Domestic uranium is required, based on U.S. policy and restrictions in international agreements on the use of most imported uranium, to satisfy the U.S. Department of Defense (DoD) requirements for maintaining effective military capabilities, including nuclear fuel for the U.S. Navy's fleet of 11 nuclear powered aircraft carriers and 70 nuclear powered submarines, source material for nuclear weapons, depleted uranium for ammunition, and other functions.
2. Uranium is also essential to maintaining U.S. critical infrastructure sectors, specifically the nation's 98 reactors for nuclear power generation to support the Nation's commercial power grid. Nuclear reactors supply 19 percent of U.S. electricity consumed in the U.S. and they support 15 of the 16 critical infrastructure sectors identified by the Department of Homeland

[5] Domestic uranium production refers to all stages of the nuclear fuel cycle and their associated products, including uranium mining, uranium milling, uranium conversion, uranium enrichment, and nuclear fuel fabrication. Uranium mining and milling produce uranium concentrate, uranium conversion produces uranium hexafluoride (UF6), uranium enrichment produces enriched uranium product (EUP), and nuclear fuel fabrication produces finished nuclear fuel assemblies.

Security (DHS).[6] Maintaining a robust civilian nuclear power industry is essential to U.S. national security, including both national defense and critical infrastructure requirements. DoD installations in the U.S. rely on the commercial power grid for 99 percent of their electricity needs.[7] The entire U.S. nuclear enterprise – weapons, naval propulsion, nonproliferation, enrichment, fuels services, and negotiations with international partners - depends on a robust U.S. civilian nuclear power industry.

3. Domestic uranium production and processing, referred to in this report as the "front-end" of the fuel cycle, depends on an economically viable, competitive U.S. commercial uranium industry.[8] The distinct stages of the U.S. nuclear fuel cycle extract uranium from the ground and ultimately transform it into fuel suitable for civilian nuclear power. The same stages of the U.S. nuclear fuel cycle are needed to fulfill national defense

[6] U.S. White House. Office of the Press Secretary. *Critical Infrastructure Security and Resilience*. Presidential Policy Directive 21. (Washington, DC: 2013) https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

[7] U.S. Department of Defense. Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics. *Report of the Defense Science Board Task Force on DoD Energy Strategy. (*Washington, DC: 2008), 18. https://apps.dtic.mil/dtic/tr/fulltext/u2/a477619.pdf

[8] For the purposes of this report, the front-end industry is defined as companies owning or operating uranium mines, uranium mills, uranium converters, uranium enrichers, and nuclear fuel fabricators.

requirements for uranium used in naval nuclear fuel and tritium production in the future.

4. Since 1946, U.S. legislation governing the uranium production and nuclear power generation industries has consistently made explicit written reference to these industries' national security functions.[9]

B. Imports in Such Quantities as Presently Found Adversely Affect the Economic Welfare of the U.S. Uranium Industry

1. In 2018, almost all uranium used for civilian U.S. nuclear electric power generation was imported, totaling approximately 94 percent of consumption. Between 2009 and 2018, U.S. nuclear electric power generators increased their reliance on imported uranium products from 85.8 percent to 93.3 percent of their annual requirements.[10] In comparison, the Department's 1989 Section 232 investigation into "The Effect of Imports of Uranium on the National Security" found that imported uranium satisfied just 51 percent of U.S. nuclear electric power generators' requirements at that time. [11]

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[9] Atomic Energy Act of 1946, as amended; Atomic Energy Act of 1954; 1964 Private Ownership of Special Nuclear Materials Act; The Energy Policy Act of 1992; The United States Enrichment Corporation Privatization Act of 1996.

[10] U.S. Energy Information Administration, "Table S1a. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994-2017", *2017 Uranium Marketing Annual Report* (May 31, 2018), https://www.eia.gov/uranium/marketing/pdf/umartableS1afigureS1.pdf

[11] U.S. Dept. of Commerce. Bureau of Export Administration; *The Effect of Imports of Uranium on the National Security*; 1989 ("1989 Report") available at https://www.bis.doc.gov/index.php/documents/section-232-investigations/88-uranium-1989/file

2. Uranium is imported into the United States in eight forms, with the two largest categories being uranium concentrate and enriched uranium. Uranium concentrate is primarily imported from Australia, Canada, Kazakhstan, and Uzbekistan. Enriched uranium is primarily imported from Russia, the United Kingdom, Germany, France, and the Netherlands.
3. Between 2014 and 2018, an average of 52 percent of U.S. nuclear electric power generator requirements of uranium concentrate was provided by Australia and Canada, 25 percent from Kazakhstan and Uzbekistan, and the remainder from Namibia (8.4 percent), Niger (2.5 percent), South Africa (2.2 percent), Malawi (1.4 percent), China (0.3 percent), and Russia (0.2 percent). The Department notes that between 2014 and 2018, an average of 24.2 percent of the uranium concentrate provided by Australian and Canadian companies to U.S. nuclear power generators was originally sourced from Kazakhstan and Uzbekistan. In the same period, 20 percent of enrichment services purchased by U.S. utilities were from Russia. While a significant portion of imports come from Australia and Canada, the non-market practices of state-owned enterprises (SOEs) have similarly harmed the financial operations of uranium producers in these countries and threaten their continued ability to supply uranium mined in Australia

or Canada to the U.S. market. China is also making steady strides to become a major supplier in the U.S. and global nuclear fuel market.

4. The entrance of China's state-owned nuclear fuel companies as potential actors in the global nuclear fuel industry will further intensify pressure on market economy producers in Canada, Australia, Europe, and the U.S. By 2020, China could have enrichment capacity beyond their domestic needs. U.S. utilities have reported purchases of uranium concentrate and enrichment services from Chinese controlled companies in the 2014-2018 period. China provided two percent of U.S. utilities' enrichment services contracts during this period, and is expected to supply even more in the coming years. Overall, the non-market business practices of Russia, Kazakhstan, Uzbekistan, and China's uranium industries continue to erode U.S. uranium mining and processing capacity.
5. Import competition from state-owned uranium enterprises has caused a significant atrophy in U.S. uranium infrastructure to the point where production levels from front-end companies are no longer economically sustainable. Documented declines in employment and skilled workforce (front-end employment is down 47 percent since 2009), as well as idling and closures of mining (13 since 2009), milling (only one of five remaining U.S. mills is presently active), and uranium conversion

operations (the last U.S. facility is idled), demonstrate the steep decline in U.S. production capacity. Additionally, loss of long-term contracts with nuclear utilities, minimal market share, falling marginal net income, and a tenuous financial outlook indicate a moribund U.S. uranium industry.

C. Displacement of Domestic Uranium by Excessive Quantities of Imports Has the Serious Effect of Weakening Our Internal Economy

1. U.S. nuclear electric power utilities and uranium suppliers face multiple challenges. Federal Energy Regulatory Commission (FERC) market rules do not compensate nuclear power and other fuel-secure generation resources for their resilience value. In addition, subsidized renewable energy and lower natural gas prices are causing premature retirements of U.S. civilian nuclear power plants before the end of their useful lives. To cut costs and remain viable in distorted U.S. electricity markets, many nuclear power operators have ended long-term contracts with higher-priced U.S. uranium producers and turned to foreign SOEs for artificially low-priced uranium imports. The loss of long-term contracts, which provided the revenue stability needed to adequately support capital investment, research and development (R&D), and facility expansion, as well as to maintain workforce and production, has adversely impacted all elements of the U.S. uranium industry.

2. High dependence on uranium imports – averaging 93.3 percent of annual U.S. nuclear power utility consumption in 2018 – has caused all elements of the U.S. uranium sector to shut down production capacity, struggle to maintain financial viability, reduce workforce, cut R&D, and slash capital expenditures. Excessive imports have dropped U.S. uranium mining production to some of the lowest levels seen since uranium mining began in the late 1940s.
3. Without a viable U.S. uranium industry, the United States cannot effectively respond to moderate or extended national security emergencies, or over the long-term meet the domestic uranium requirements of the U.S. Department of Defense. Moreover, U.S. nuclear electric power generators would not be able to operate at full capacity and would not be able to support critical infrastructure electric power needs if foreign nations, particularly Russia and other former Soviet states, chose to suspend or otherwise end uranium exports to the United States.

D. Uranium Market Distortion by State-Owned Enterprises is a Circumstance That Contributes to the Weakening of the Domestic Economy

1. The 2011 Fukushima Daichii incident prompted the shutdown and/or idling of existing nuclear operators in Japan, Germany, and other countries. Additionally, many proposed nuclear reactors around the world, including in the United States, were cancelled. These actions decreased global

demand for uranium, creating a supply glut and low uranium prices. This has severely affected the financial viability of U.S. uranium mining and milling in particular, as uranium imports have reached over 94 percent of U.S. utility consumption.

2. The Fukushima incident caused similar declines in other elements of the U.S. front-end nuclear fuel business, including conversion, enrichment, and fuel fabrication companies. [redacted] As of 2018, the total domestic front-end uranium industry employs 4,958 workers, compared to 9,232 workers in 2009, a decline of 47 percent.
3. During this same period SOEs in Russia, Kazakhstan, and Uzbekistan undercut U.S. uranium producers with lower priced uranium. SOEs in China also injected additional quantities of uranium into the marketplace despite lower prices and a drop in overall demand. In contrast, U.S. producers significantly cut production, shut down capacity, and shrank workforce levels.

4. Market economy uranium producers such as Australia, Canada, South Africa, France, Germany, the Netherlands, and the United Kingdom have also been forced to curtail or suspend operations due to the excess production by SOE uranium producers that has depressed global uranium prices. SOE competition has displaced demand for Canadian and Australian product. Between 2016 and 2017, Canada cut back domestic production approximately 6.6 percent. Australia reduced output by 6.9 percent. In contrast, Russia and Kazakhstan decreased their production by only 5.1 and 2.9 percent, respectively; but China increased production by 16 percent. Uzbekistan made no production cuts.
5. U.S. nuclear electric power generators maintain only a limited amount of nuclear fuel materials in reserve to address potential supply disruptions. The U.S. Government maintains only a small stockpile of enriched uranium for utility use in the event of a fuel supply disruption. U.S. nuclear electric power generators are therefore vulnerable to sudden and extended disruptions in the nuclear fuel supply chain, especially product supplied through Russia and Kazakhstan.

Conclusion

Based on these findings, the Secretary of Commerce has concluded that the present quantities and circumstance of uranium imports are "weakening our internal economy" and "threaten to impair the national security" as defined in Section 232. An economically viable, secure supply of U.S.-sourced uranium is required for national defense needs. International obligations, including agreements with foreign partners under Section 123 of the Atomic Energy Act of 1954, govern the use of most imported uranium and typically restrict it to peaceful, non-explosive uses. As a result, uranium used for military purposes must generally be domestically produced from mining through the fuel fabrication process. Furthermore, the predictable maintenance and support of U.S. critical infrastructure, especially the electric power grid, depends on a diverse supply of uranium, which includes U.S.-sourced uranium products and services.

The Secretary further recognizes that the U.S. uranium industry's financial and production posture has significantly deteriorated since the Department's 1989 Report. That investigation noted that U.S. nuclear power utilities imported 51.1 percent of their uranium requirements in 1987. By 2018, imports had increased to 93.3 percent of those utilities' annual requirements. Based on comprehensive 2019 industry data provided by U.S. uranium producers and U.S. nuclear electric power utilities to the Department in response to a mandatory survey, U.S. utilities' usage

of U.S. mined uranium has dropped to nearly zero. [redacted] Based on the current and projected state of the U.S. uranium industry, the Department has concluded that the U.S. uranium industry is unable to satisfy existing or future national security needs or respond to a national security emergency requiring a large increase in domestic uranium production.

Absent immediate action, closures of the few remaining U.S. uranium mining, milling, and conversion facilities are anticipated within the next few years. Further decreases in U.S. uranium production and capacity, including domestic fuel fabrication, will cause even higher levels of U.S. dependence on imports, especially from Russia, Kazakhstan, Uzbekistan, and China. Increased imports from SOEs in those countries, and in particular Russia and China, which the 2017 National Security Strategy noted present a direct challenge to U.S. influence, are detrimental to the national security.[12] The high risk of loss of the remaining U.S. domestic uranium industry if the present excessive level of imports continue threatens to impair the national security as defined by Section 232.

[12] U.S. White House Office. *National Security Strategy of the United States of America. (*Washington, DC: 2017), 2 https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905-2.pdf

The Secretary has determined that to remove the threat of impairment to national security, it is necessary to reduce imports of uranium to a level that enables U.S. uranium producers to return to an economically competitive and financially viable position. This will allow the industry to sustain production capacity, hire and maintain a skilled workforce, make needed capital expenditures, and perform necessary research and development activities. A modest reduction of uranium imports will allow for the revival of U.S. uranium mining and milling, the restart of the sole U.S. uranium converter, and a reduction in import challenges to fuel fabricators, while also recognizing the market and pricing challenges confronting the U.S. nuclear power utilities.

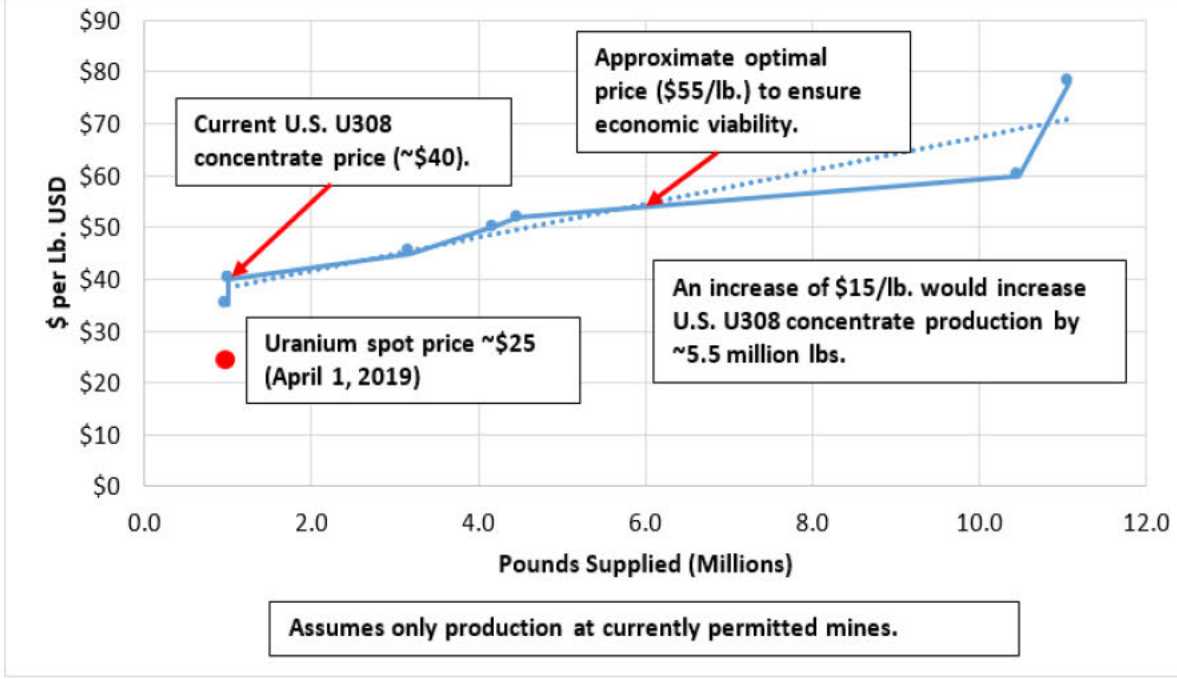
Recommendation

Due to the threat to the national security, as defined in Section 232, from excessive uranium imports, the Secretary recommends that the President take immediate action by adjusting the level of these imports through the implementation of an import waiver to achieve a phased-in reduction of uranium imports. The reduction in imports of uranium should be sufficient to enable U.S. producers to recapture and sustain a market share of U.S. uranium consumption that will allow for financial viability, and would enable the maintenance of a skilled workforce and the production capacity and uranium output needed for national defense and critical infrastructure requirements. The reduction imposed

should be sufficient to enable U.S. producers to eventually supply 25 percent of U.S. utilities' uranium needs based on 2018 U.S. U308 concentrate annual consumption requirements.

Based on the survey responses, the Department has determined that U.S. uranium producers require an amount equivalent to 25 percent of U.S. nuclear power utilities' 2018 annual U308 concentrate consumption to ensure financial viability. Based on the Department's analysis, if U.S.-mined uranium supplied 25 percent of U.S. nuclear power utilities' annual U308 concentrate consumption, U.S. uranium prices will increase to approximately $55 per pound (*see* Figure 1A). The current spot price is low due to distortions from SOEs.

Figure 1A: U.S. Uranium Supply Curve



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 4b

The $55 per pound price will increase mine capacity to the point where U.S. uranium mines can supply approximately 6 million pounds of uranium concentrate per year, which is approximately 25 percent of U.S. nuclear power utilities' consumption for U308 concentrate in any given year.

The Secretary recommends that the import reduction be phased in over a five-year period. This will allow U.S. uranium mines, mills, and converters to reopen or expand closed or idled facilities; hire, train and maintain a skilled workforce; and make necessary investments in new capacity. This phased-in approach will also allow U.S. nuclear power utilities time to adjust and diversify their fuel procurement contracts to reintroduce U.S. uranium into their supply chains.

The Secretary recommends that either a targeted or global quota be used to adjust the level of imports and that such quota should be in effect for a duration sufficient to allow the necessary time needed to stabilize and revitalize the U.S. uranium industry. According to survey responses, the average time to restart an idle uranium production facility is two to five years, and several additional years are needed to add new capacity. Market certainty, which can be provided by long-term contracts with U.S. nuclear power utilities, is needed to build cash flow, pay down debt, and raise capital for site modernization; workforce recruitment; and to conduct environmental and regulatory reviews.

Option 1 – Targeted Zero Quota

This targeted zero quota option would prohibit imports of uranium from Kazakhstan, Uzbekistan, and China (the "SOE countries") to enable U.S. uranium producers to supply approximately 25 percent of U.S. nuclear power utility consumption. A U.S. nuclear power utility or other domestic user would be eligible for a waiver that allows the import of uranium from the SOE countries, with any import of uranium from Russia subject to the Russian Suspension Agreement, after such utility or user files appropriate documentation with the Department. In the case of a U.S. nuclear power utility, the documentation must show that such utility has a contract or contracts to purchase for their consumption on an annual basis not less than the percentage of U.S. produced uranium U308 concentrate shown in the phase-in table below.

Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.					
Year	2020	2021	2022	2023	2024 and beyond
Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.	5%	10%	15%	20%	25%

Phased-in incrementally over five years, this option will help facilitate the reopening and expansion of U.S. uranium mining, milling, and conversion facilities, and will ensure that U.S. uranium producers can make investments required for future financial viability without causing unintentional harm to other

market economy uranium producers. This option avoids undue financial harm to U.S. nuclear power utilities by affording them sufficient time to adjust their fuel procurement strategies.

The zero quota on uranium imports from SOE countries would not apply to uranium imports from SOE countries for use by U.S. milling, conversion, enrichment, and fuel fabrication services that produce uranium products for export from the United States. A U.S. milling, conversion, enrichment, or fuel fabricator seeking to import uranium from an SOE country for use to produce uranium products for export would need to file appropriate documentation with the Department to obtain a waiver for the import of such uranium for export.

The Secretary believes that this option to impose a zero quota for imports of uranium from SOE countries, while continuing to allow unrestricted importation of uranium from Canada, Australia, and EURATOM[13] member countries based on their security and economic relationships with the United States, should address the threatened impairment of U.S. national security. This would be accomplished by promoting the economic revival of the U.S. uranium industry, so long as there is

[13] As of April 2019, EURATOM includes all 28 members of the European Union. The United Kingdom will cease to be a member of EURATOM if and when it leaves the European Union. Should the United Kingdom cease to be a member of EURATOM, the same preferential treatment given to EURATOM members will also be applied to the United Kingdom.

not significant transshipment or reprocessing of SOE country uranium through these unrestricted countries.

The Department will monitor these unrestricted imports to ensure there is not significant transshipment, reprocessing, or book transfers from SOE countries to unrestricted countries in an attempt to circumvent and undermine the U.S. uranium producers' ability to provide 25 percent of U.S. annual U308 concentrate consumption. Many companies in unrestricted countries supply uranium sourced from SOE countries. Consequently, up to one-third of the materials delivered to U.S. nuclear power utilities, at this time, is not sourced directly from the country of import.

Imports of uranium from Russia under a waiver would also be subjected to the Russian Suspension Agreement. This option assumes that such agreement will continue to be in effect over the relevant time period and would apply to any Russian uranium imports by U.S. nuclear power utilities, thus holding Russian uranium imports to their current level of approximately 20 percent of U.S. enrichment demand. In the event that the Russian Suspension Agreement is not extended and terminates, then the Secretary recommends that a quota on uranium imports under a waiver of Russian Uranium Products (as defined in the Russian Suspension Agreement) of up to 15 percent of U.S. enrichment demand be

imposed. If adopted this quota would be administered by the Department in the same manner as the Russian Suspension Agreement is presently administered.

The adjustment of imports proposed under this option would be in addition to any applicable antidumping or countervailing duties collections.

To complement the proposed trade action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) should act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear and other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy and will make recommendations to the President regarding whether it should be modified, extended, or terminated.

Option 2 – Global Zero Quota

This option would establish a zero quota on imports of uranium from all countries until specific conditions are met to enable U.S. producers to supply 25 percent of U.S. nuclear power utilities' annual consumption of uranium U308 concentrate. A U.S. nuclear power utility or other domestic user would be eligible for a waiver to import uranium from any country after submitting appropriate documentation to the Department. In the case of a U.S. nuclear power utility, the documentation must show that such utility has a contract or contracts to purchase for their consumption on an annual basis not less than the percentage of U.S. produced uranium U308 concentrate shown in the phase-in table below.

Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.					
Year	2020	2021	2022	2023	2024 and beyond
Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.	5%	10%	15%	20%	25%

Phased-in incrementally over five years, this option will help facilitate the reopening and expansion of U.S. uranium mining, milling, and conversion facilities, and will ensure that U.S. uranium producers can make investments required for future financial viability. This option avoids undue financial harm to U.S. nuclear power utilities by affording them sufficient time to adjust their fuel procurement strategies.

The zero quota on uranium imports would not apply to uranium imports for use by U.S. milling, conversion, enrichment, and fuel fabrication services that produce uranium products for export from the United States. A U.S. milling, conversion, enrichment, or fuel fabricator seeking to import uranium for use to produce uranium products for export would need to file appropriate documentation with the Department to obtain a waiver for the import of uranium.

The Department will provide adequate time for U.S. industry to receive a waiver prior to a zero quota being implemented globally. Based on information received during the investigation, the Department believes that this option will not cause undue burdens.

The Secretary believes that this option to impose a zero quota for imports of uranium will address the threatened impairment of U.S. national security by promoting the economic revival of the U.S. uranium industry. This option also prevents the possibility of transshipment of SOE overproduction through third countries and avoids undue harm to U.S. enrichment and fuel fabrication export operations. These domestic export operations rely on an ability to access working uranium stock regardless of the specific mining origin of a given uranium-based material.

Tennessee Valley Authority (TVA) purchases of Canadian UO_3 natural uranium diluent in its execution of the National Nuclear Security Administration's

current highly-enriched uranium (HEU) down-blending campaign would be excluded from the zero quota on imports of uranium. In addition, any transfer pursuant to a Mutual Defense Agreement that references special nuclear material would be excluded from the zero quota on imports of uranium.

Imports of uranium from Russia under a waiver would also be governed by the Russian Suspension Agreement. This option assumes that such agreement will continue to be in effect over the relevant time period and would apply to any Russian uranium imports by U.S. nuclear power utilities, thus holding Russian uranium imports to their current level of approximately 20 percent of U.S. enrichment demand. In the event that the Russian Suspension Agreement is not extended and terminates, then the Secretary recommends that a quota on uranium imports under a waiver of Russian Uranium Products (as defined in the Russian Suspension Agreement) of up to 15 percent of U.S. enrichment demand be imposed. If adopted, this quota would be administered by the Department in the same manner as the Russian Suspension Agreement is presently administered.

The adjustment of imports proposed under this option would be in addition to any applicable antidumping or countervailing duties collections.

To complement the proposed trade action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) should act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear

and other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy to determine if it should be modified, extended, or terminated.

Option 3 – Alternative Action

Should the President determine that the threatened impairment of national security does not warrant immediate adjustment of uranium imports at this time but that alternative action should be taken to improve the condition of the U.S. uranium industry to enable the U.S. industry to supply 25 percent of U.S nuclear power utilities annual consumption of uranium U308 concentrate, the President could direct the Department of Defense (DOD) and the Department of Energy (DOE) to report to the President within 90 days on options for increasing the

economic viability of the domestic uranium mining industry. The report should include, but not be limited to, recommendations for: (1) the elimination of regulatory constraints on domestic producers; (2) incentives for increasing investment; and (3) ways to work with likeminded allies to address unfair trade practices by SOE countries, including through trade remedy actions and the negotiation of new rules and best practices. The President could also direct the United States Trade Representative to enter into negotiations with the SOE countries to address the causes of excess uranium imports that threaten the national security.

To complement the proposed alternative action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) should act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear and other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy and recommend to the President if any additional measures are needed. Alternatively, the Secretary may initiate another investigation under Section 232.

The Secretary also makes public policy recommendations for additional measures that complement these three options.

II. Legal Framework

A. Section 232 Requirements

Section 232 provides the Secretary with the authority to conduct investigations to determine the effect on the national security of the United States of imports of any article. It authorizes the Secretary to conduct an investigation if requested by the head of any department or agency, upon application of an interested party, or upon his own motion. *See* 19 U.S.C. § 1862(b)(1)(A).

Section 232 directs the Secretary to submit to the President a report with recommendations for "action or inaction under this section" and requires the Secretary to advise the President if any article "is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security." *See* 19 U.S.C. § 1862(b)(3)(A).

Section 232(d) directs the Secretary and the President to, in light of the requirements of national security and without excluding other relevant factors, give consideration to the domestic production needed for projected national defense requirements and the capacity of the United States to meet national security requirements. *See* 19 U.S.C. § 1862(d).

Section 232(d) also directs the Secretary and the President to "recognize the close relation of the economic welfare of the Nation to our national security, and …take into consideration the impact of foreign competition on the economic welfare of individual domestic industries" by examining whether any substantial unemployment, decrease in revenues of government, loss of skills or investment, or other serious effects resulting from the displacement of any domestic products by excessive imports, or other factors, results in a "weakening of our internal economy" that may impair the national security.[14] *See* 19 U.S.C. § 1862(d).

Once an investigation has been initiated, Section 232 mandates that the Secretary provide notice to the Secretary of Defense that such an investigation has been initiated. Section 232 also requires the Secretary to do the following:

> (1) "Consult with the Secretary of Defense regarding the methodological and policy questions raised in [the] investigation;"

[14] An investigation under Section 232 looks at excessive imports for their threat to the national security, rather than looking at unfair trade practices as in an antidumping investigation.

(2) "Seek information and advice from, and consult with, appropriate officers of the United States;" and

(3) "If it is appropriate and after reasonable notice, hold public hearings or otherwise afford interested parties an opportunity to present information and advice relevant to such investigation."[15] *See* 19 U.S.C. § 1862(b)(2)(A)(i)-(iii).

As detailed in the report, all of the requirements set forth above have been satisfied.

In conducting the investigation, Section 232 permits the Secretary to request that the Secretary of Defense provide an assessment of the defense requirements of the article that is the subject of the investigation. *See* 19 U.S.C. § 1862(b)(2)(B). Upon completion of a Section 232 investigation, the Secretary is required to submit a report to the President no later than 270 days after the date on which the investigation was initiated. *See* 19 U.S.C. § 1862(b)(3)(A). The report must:

(1) Set forth "the findings of such investigation with respect to the effect of the importation of such article in such quantities or under such circumstances upon the national security;"

(2) Set forth, "based on such findings, the recommendations of the Secretary for action or inaction under this section;" and

(3) "If the Secretary finds that such article is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security . . . so advise the President." S*ee* 19 U.S.C. § 1862(b)(3)(A).

[15] Department regulations (i) set forth additional authority and specific procedures for such input from interested parties, *see* 15 C.F.R. §§ 705.7 and 705.8, and (ii) provide that the Secretary may vary or dispense with those procedures "in emergency situations, or when in the judgment of the Department, national security interests require it." *Id*., § 705.9.

All unclassified and non-proprietary portions of the report submitted by the Secretary to the President must be published.

Within 90 days after receiving a report in which the Secretary finds that an article is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security, the President shall:

(1) "Determine whether the President concurs with the finding of the Secretary"; and

(2) "If the President concurs, determine the nature and duration of the action that, in the judgment of the President, must be taken to adjust the imports of the article and its derivatives so that such imports will not threaten to impair the national security" (*see* 19 U.S.C. § 1862(c)(1)(A)).

B. Discussion

While Section 232 does not specifically define "national security," both Section 232, and the implementing regulations at 15 C.F.R. Part 705, contain non-exclusive lists of factors that the Secretary must consider in evaluating the effect of imports on the national security. Congress in Section 232 explicitly determined that "national security" includes, but is not limited to, "national defense" requirements. *See* 19 U.S.C. § 1862(d)).

The Department in 2001 determined that "national defense" includes both defense of the United States directly and the "ability to project military capabilities

globally."[16] The Department also concluded in 2001 that, "In addition to the satisfaction of national defense requirements, the term "national security" can be interpreted more broadly to include the general security and welfare of certain industries, beyond those necessary to satisfy national defense requirements, which are critical to the minimum operations of the economy and government." The Department called these "critical industries."[17] This report once again uses these reasonable interpretations of 'national defense" and "national security." However, this report uses the more recent 16 critical infrastructure sectors identified in Presidential Policy Directive 21[18] instead of the 28 industry sectors used by the Bureau of Export Administration in the 2001 Report.[19]

Section 232 directs the Secretary to determine whether imports of any article are being made "in such quantities" or "under such circumstances" that those imports "threaten to impair the national security." *See* 19 U.S.C. § 1862(b)(3)(A). The statutory construction makes clear that either the quantities or the circumstances, standing alone, may be sufficient to support an affirmative finding.

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[16] Department of Commerce, Bureau of Export Administration; *The Effects of Imports of Iron Ore and Semi-Finished Steel on the National Security*; Oct. 2001 ("2001 Iron and Steel Report") at 5.

[17] *Id.*

[18] Presidential Policy Directive 21; *Critical Infrastructure Security and Resilience*; February 12, 2013 ("PPD-21").

[19] *See Op. Cit.* at 16.

They may also be considered together, particularly where the circumstances act to prolong or magnify the impact of the quantities being imported.

The statute does not define a threshold for when "such quantities" of imports are sufficient to threaten to impair the national security, nor does it define the "circumstances" that might qualify.

Likewise, the statute does not require a finding that the quantities or circumstances are impairing the national security. Instead, the threshold question under Section 232 is whether those quantities or circumstances "threaten to impair the national security." *See* 19 U.S.C. § 1862(b)(3)(A). This makes evident that Congress expected an affirmative finding under Section 232 before an actual impairment of the national security. [20]

Section 232(d) contains a list of factors for the Secretary to consider in determining if imports "threaten to impair the national security"[21] of the United States, and this list is mirrored in the implementing regulations. *See* 19 U.S.C. §1862(d) and 15 C.F.R. § 705.4. Congress was careful to note twice in Section

[20] The 2001 Iron and Steel Report used the phrase "fundamentally threaten to impair" when discussing how imports may threaten to impair national security. *See* 2001 Iron and Steel Report at 7 and 37. Because the term "fundamentally" is not included in the statutory text and could be perceived as establishing a higher threshold, the Secretary expressly does not use the qualifier in this report. The statutory threshold in Section 232(b)(3)(A) is unambiguously "threaten to impair" and the Secretary adopts that threshold without qualification. 19 U.S.C. § 1862(b)(3)(A).

[21] 19 U.S.C. § 1862(b)(3)(A).

232(d) that the list provided, while mandatory, is not exclusive.[22] Congress' illustrative list is focused on the ability of the United States to maintain the domestic capacity to provide the articles in question as needed to maintain the national security of the United States.[23] Congress broke the list of factors into two equal parts using two separate sentences. The first sentence focuses directly on "national defense" requirements, thus making clear that "national defense" is a subset of the broader term "national security." The second sentence focuses on the broader economy and expressly directs that the Secretary and the President "shall recognize the close relation of the economic welfare of the Nation to our national security."[24] *See* 19 U.S.C. § 1862(d).

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[22] *See* 19 U.S.C. § 1862(d) ("the Secretary and the President shall, in light of the requirements of national security and without excluding other relevant factors…" and "serious effects resulting from the displacement of any domestic products by excessive imports shall be considered, without excluding other factors…").

[23] This reading is supported by Congressional findings in other statutes. *See, e.g.,* 15 U.S.C. § 271(a)(1)("The future well-being of the United States economy depends on a strong manufacturing base…") and 50 U.S.C. § 4502(a)("Congress finds that – (1) the security of the United States is dependent on the ability of the domestic industrial base to supply materials and services… (2)(C) to provide for the protection and restoration of domestic critical infrastructure operations under emergency conditions… (3)… the national defense preparedness effort of the United States government requires – (C) the development of domestic productive capacity to meet – (ii) unique technological requirements… (7) much of the industrial capacity that is relied upon by the United States Government for military production and other national defense purposes is deeply and directly influenced by – (A) the overall competitiveness of the industrial economy of the United States; and (B) the ability of industries in the United States, in general, to produce internationally competitive products and operate profitably while maintaining adequate research and development to preserve competitiveness with respect to military and civilian production; and (8) the inability of industries in the United States, especially smaller subcontractors and suppliers, to provide vital parts and components and other materials would impair the ability to sustain the Armed Forces of the United States in combat for longer than a short period.").

[24] *Accord* 50 U.S.C. § 4502(a).

In addition to "national defense" requirements, two of the factors listed in the second sentence of Section 232(d) are particularly relevant in this investigation. Both are directed at how "such quantities" of imports threaten to impair national security *See* 19 U.S.C. § 1862(b)(3)(A). In administering Section 232, the Secretary and the President are required to "take into consideration the impact of foreign competition on the economic welfare of individual domestic industries" and any "serious effects resulting from the displacement of any domestic products by excessive imports" in "determining whether such weakening of our internal economy may impair the national security." *See* 19 U.S.C. § 1862(d).

Another factor, not on the list, that the Secretary found to be relevant is the presence of global excess supply of uranium. This excess supply results in uranium imports occurring "under such circumstances" that they threaten to impair the national security. *See* 19 U.S.C. § 1862(b)(3)(A). The Secretary considers excess global uranium supply as a relevant circumstance because state-owned enterprises have maintained or increased uranium production, and reduced prices, notwithstanding declining market conditions. At the same time, market producers, including U.S. producers, have decreased production under these market conditions. This excess supply means that U.S. uranium producers, for the foreseeable future, face increasing competition from state-owned uranium producers as well as foreign market-based competitors.

After careful examination of the facts in this investigation, the Secretary has concluded that excessive imports of uranium in the present circumstances are weakening our internal economy and threaten to impair the national security as defined in Section 232. Several important factors support this conclusion, including the global excess uranium supply due to non-market based production by state-owned enterprises, the resulting near total dependence of U.S. nuclear power production on uranium imports, and the impact that the loss of a domestic U.S. uranium production capacity and workforce would have on the nation's ability to respond to potential national emergencies.

III. Investigation Process

A. Initiation of Investigation

On January 16, 2018, Energy Fuel Resources (US) Inc. and UR-Energy USA Inc. (hereafter "Petitioners") petitioned the Secretary to conduct an investigation under Section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. § 1862), to determine the effect of imports of uranium on the national security.

Upon receipt of the petition, the Department carefully reviewed the material facts outlined in the petition. Initial discussions were held with other bureaus within the Department of Commerce as well as with other interested parties at the Departments of Defense and Energy. Legal counsel at the Department also carefully reviewed the petition to ensure it met the requirements of the Section 232 statute and the implementing regulations. Subsequently, on July 18, 2018, the Department accepted the petition and initiated the investigation. Pursuant to Section 232(b)(1)(b), the Department notified the U.S. Department of Defense with a July 18, 2018 letter from Secretary Ross to the Secretary of Defense, James Mattis (*see* Appendix A).

On July 25, 2018, the Department published a Federal Register Notice (*see* Appendix B - Federal Register, Vol. 83, No. 143, 35,204-35,205) announcing the initiation of an investigation to determine the effect of imports of uranium on the

national security. The notice also announced the opening of the public comment period.

B. Public Comments

On July 25, 2018, the Department invited interested parties to submit written comments, opinions, data, information, or advice relevant to the criteria listed in Section 705.4 of the National Security Industrial Base Regulations (15 C.F.R. § 705.4) as they affect the requirements of national security, including the following:

(a) Quantity of the articles subject to the investigation and other circumstances related to the importation of such articles;

(b) Domestic production capacity needed for these articles to meet projected national defense requirements;

(c) The capacity of domestic industries to meet projected national defense requirements;

(d) Existing and anticipated availability of human resources, products, raw materials, production equipment, facilities, and other supplies and services essential to the national defense;

(e) Growth requirements of domestic industries needed to meet national defense requirements and the supplies and services including the investment, exploration and development necessary to assure such growth;

(f) The impact of foreign competition on the economic welfare of any domestic industry essential to our national security;

(g) The displacement of any domestic products causing substantial unemployment, decrease in the revenues of government, loss of investment or specialized skills and productive capacity, or other serious effects;
(h) Relevant factors that are causing or will cause a weakening of our national economy; and

(i) Any other relevant factors

The public comment period was originally scheduled to end on September 10, 2018. Following requests from the general public, the Department extended the deadline from September 10 to September 25 (*see* Appendix B - Federal Register Vol. 83, No. 175, 45,595-45,596). The Department received 1,019 written submissions concerning this investigation. Representative samples were grouped together then 837 comments were posted on Regulations.gov for public review. Parties who submitted comments included firms representing all parts of the nuclear fuel cycle, representatives of U.S. federal, state and local governments, foreign governments, as well as other concerned organizations. All public comments were carefully reviewed and factored into the investigative process. The public comments of key stakeholders are summarized in Appendix C, along with a link to the docket (BIS-2018-0011) where all public comments can be viewed in full on Regulations.gov.

Due to the limited number of firms engaged in the U.S. uranium industry and in nuclear power generation, it was determined that a public hearing was not necessary in order to conduct a comprehensive investigation. In lieu of holding a public hearing on this investigation, the Department issued two separate mandatory surveys (*see* Appendix D and Appendix E) to participants in the U.S. front-end uranium industry and the U.S. nuclear power generation sector, which collected

both qualitative and quantitative information. The front-end survey was sent to 34 companies engaged in uranium mining and milling, uranium concentrate production, uranium enrichment, and nuclear fuel fabrication. The nuclear power generation survey was sent to all 24 operators of U.S. nuclear power plants and covered 98 reactors.

The surveys provided an opportunity for organizations to disclose confidential and non-public information needed by the Department to conduct a thorough investigation. These mandatory surveys were conducted using statutory authority pursuant to Section 705 of the Defense Production Act of 1950, as amended (50 U.S.C. § 4555), and collected detailed information concerning factors such as imports/exports, production, capacity utilization, employment, operating status, global competition, and financial information. The resulting aggregate data provided the Department with detailed industry information that was otherwise not publicly available and was needed to effectively conduct analysis for this investigation.

Responses to the Department's surveys were required by law (50 U.S.C. § 4555). Information furnished in the survey responses is deemed confidential and will not be published or disclosed except in accordance with Section 705 of the DPA. Section 705 of the DPA prohibits the publication or disclosure of this information unless the President determines that the withholding of such

information is contrary to the interest of the national defense. Information will not be shared with any non-government entity other than in aggregate form.

C. Site Visits and Information Gathering Activities

To obtain additional information on the U.S. uranium industry and the U.S. nuclear power generation sector, the Department conducted site visits to several uranium and nuclear power generation facilities:

1) Calvert Cliffs Nuclear Power Plant in Lusby, Maryland. This is a double reactor facility.

2) Three uranium mines: La Sal (Utah – Conventional Mine), Nichols Ranch (Wyoming – In Situ facility), and Lost Creek (Wyoming – In Situ facility).

3) White Mesa Mill in Blanding, Utah. This facility is the only fully-licensed and operating conventional uranium mill in the U.S.

In order to gain insights into the U.S. uranium industry's challenges, information gathering activities and meetings were held with representatives of domestic and international uranium producers, associations, power generators, foreign governments, and others interested parties.

D. Interagency Consultation

The Department consulted with the Department of Defense including the Office of Industrial Base, Defense Logistics Agency, and the Department of the Navy regarding methodological and policy questions that arose during the investigation.

The Department also consulted with other U.S. Government agencies with expertise and information regarding the uranium industry including the Department of Energy, the Energy Information Administration, the National Nuclear Security Administration, the International Trade Administration, the Department of State, the Office of the United States Trade Representative, the Nuclear Regulatory Commission, the U.S. Geological Survey, and the Federal Energy Regulatory Commission.

E. Review of the Department of Commerce 1989 Section 232 Investigation on Uranium Imports

The Department reviewed the previous Section 232 Investigation on the Effect of Uranium Imports on National Security from September 1989. This investigation, requested by the Secretary of Energy, determined that U.S. utilities imported a significant share of their uranium requirements. In 1987, U.S. utilities imported approximately 51.1 percent of their requirements, and the investigation projected that this level would reach 70.8 percent by 1993.[25] The 1989 investigation also found that U.S. uranium producers faced strong foreign competition, particularly from the Soviet Union. It further reported that employment in the domestic industry was steadily decreasing.[26]

[25] 1989 Report, Letter Requesting 232 Investigation, also III-21.

[26] 1989 Report, III-2, III-25.

[redacted][27] Consequently, the Secretary concluded that uranium was not being imported into the United States under such quantities or circumstances that threatened to impair the national security.

The Department took note of the methodologies and analytic approaches used to conduct the 1989 investigation and evaluated its findings and conclusion in light of the current state of the U.S. uranium industry. Further discussion of the September 1989 Section 232 Investigation is in Appendix G.

IV. Product Scope of the Investigation

The scope of this investigation defined uranium products at the Harmonized Tariff Schedule of the United States (HTS) 10-digit level. The eight product categories and related HTS codes covered by this report (*see* Figure 1B) are produced by U.S. uranium companies engaged in the nuclear fuel cycle, and are imported for use by U.S. nuclear power operators. Detailed information was collected in the Department's survey responses from U.S. uranium producers and

[27] Ibid., V-4 to V-5.

U.S. nuclear power operators regarding products covered by the HTS codes. These products are used in, or otherwise support, various national defense and critical infrastructure applications.

Figure 1B: Uranium Product Scope of the Investigation	
Heading/Subheading/Product	**10 Digit HTS Code**
Imports of uranium ores and concentrates, natural uranium compounds, and all forms of enriched uranium:	
• Uranium Ore and Concentrates	2612.10.00.00
• Uranium Compounds (Oxide, Hexafluoride, and Other)	Oxide 2844.10.20.10 Hexafluoride 2844.10.20.25 Other 2844.10.20.55
• Uranium enriched in U235 and its compounds; alloys, dispersions (including cermets), ceramic products and mixtures containing uranium enriched in U235	Oxide 2844.20.00.10 Hexafluoride 2844.20.00.20 Other 2844.20.00.30
Imports of natural uranium metal and forms of natural uranium other than compounds:	
• Uranium Metal	2844.10.10.00
• Other	2844.10.50.00
Uranium depleted in U235 and its compounds; thorium and its compounds; alloys, dispersions (including cermets), ceramic products and mixtures containing uranium depleted in U235, thorium, or compounds of these products:	
• Uranium Compounds (Depleted)	Oxide 2844.30.20.10 Fluorides 2844.30.20.20 Other 2844.30.20.50
• Other (Depleted)	Uranium Metal 2844.30.50.10
Nuclear reactors; fuel elements (cartridges), non-irradiated, for nuclear reactors; machinery and apparatus for isotopic separation; parts there of:	
• Fuel elements (cartridges), non-irradiated, and parts thereof	8401.30.00.00
Source: United States International Trade Commission and U.S. Department of Commerce, Bureau of Industry and Security	

In addition to the uranium products identified in Figure 1, this report examines the provision of three services in the nuclear fuel cycle: conversion,[28]

[28] Conversion is defined as the conversion of uranium concentrate (U3O8) to uranium hexafluoride (UF6).

enrichment,[29] and fuel fabrication.[30] Transactions for these services are examined separately from transactions involving uranium hexafluoride (UF6), enriched uranium product (EUP) and finished fuel assemblies (fuel for nuclear power plants). The Department made this distinction because U.S. nuclear power operators, the end-consumer of most uranium products in the U.S., purchase services and finished products for UF6, EUP, and finished fuel assemblies.

A U.S. utility, for example, may opt to buy a specified amount of UF6, EUP, or finished fuel assemblies directly from a producer. Alternatively, it may directly contract for conversion, enrichment, or fuel fabrication services using material owned by the utility. These services are regularly procured both inside and outside the United States.

The Department determined that assessing U.S. utilities' procurement of UF6 or EUP through conversion, enrichment, and fuel fabrication services was critical to understanding the effects of imports of uranium products on U.S. national security. Information regarding conversion, enrichment, and fuel fabrication services was collected and incorporated into the investigation via the front-end uranium industry survey.

[29] Enrichment is defined as the process that increases the concentration of Uranium-235 isotopes within a quantity of natural uranium.

[30] Fuel fabrication is defined as the process by which enriched uranium is converted to uranium dioxide powder that is then pressed into pellets and placed in fuel rods. Bundles of these fuel rods become fuel assemblies that are placed in nuclear reactors.

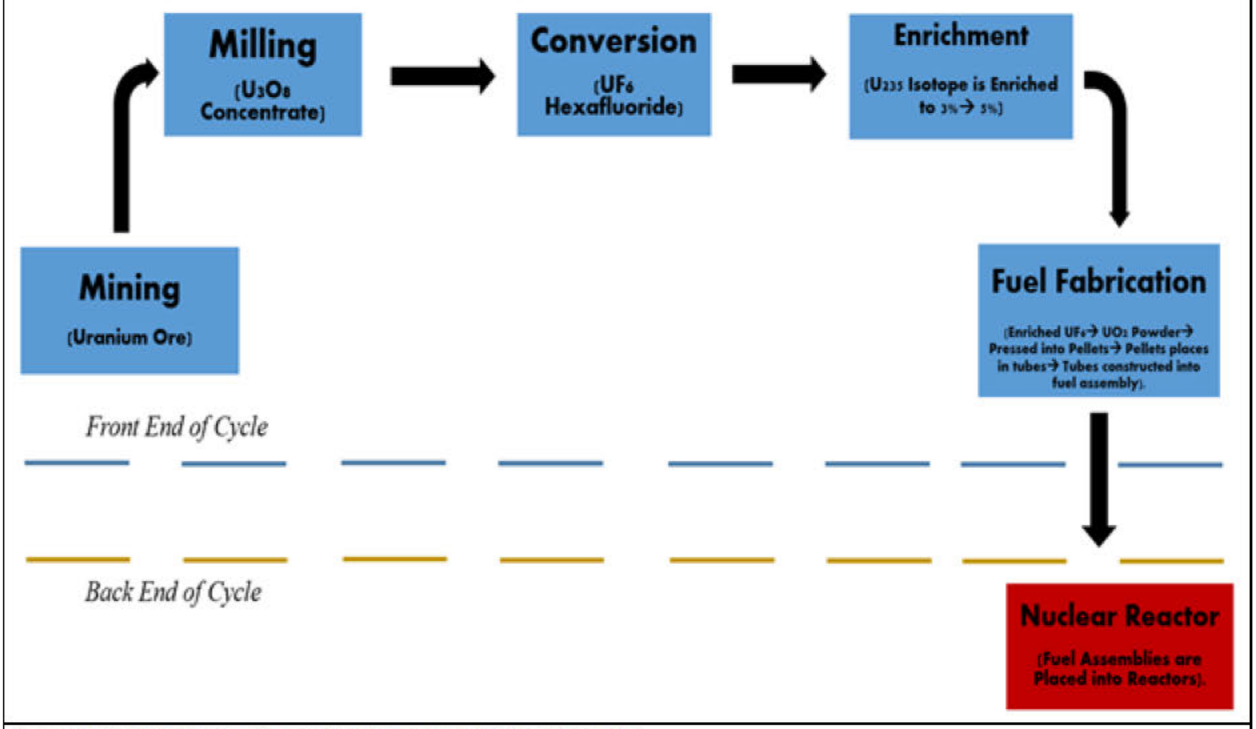
This report also examines the state of the U.S. nuclear power generation sector. The Department is aware that the principal customers of uranium are nuclear power reactor operators, thus examination of the U.S. nuclear power generation industry through a comprehensive Department survey was necessary to ensure a complete analysis of the effect of uranium imports on the national security. The Secretary's recommendations consider the interdependence of the U.S. uranium industry and the U.S. nuclear power generation sector.

V. Background on the U.S. Nuclear Industry

A. Summary of the U.S. Uranium Fuel Cycle

The processes that prepare uranium for use in nuclear power generation constitute the front-end of the nuclear fuel cycle. In the United States, these front-end processes consist of uranium mining, milling, conversion, enrichment, and nuclear fuel fabrication. The nuclear fuel cycle and its products at each stage are shown in Figure 2.

Figure 2: Nuclear Fuel Cycle



Source: U.S. Department of Commerce, Bureau of Industry and Security

Uranium mining is the first step of the cycle. Several techniques are used for uranium mining including open pit, underground, and in-situ recovery (ISR). The ISR technique, used by all active U.S. uranium mining operations today, involves pumping a slightly acidic solution into ore bodies to dissolve uranium ore in preparation for extraction.[31]

The ore-bearing solution recovered from uranium mining is then transferred to a facility for processing into tri-uranium octoxide concentrate (U3O8), commonly referred to as uranium concentrate. For open pit and underground

[31] "Nuclear Explained: The Nuclear Fuel Cycle." U.S. Energy Information Administration. https://www.eia.gov/energyexplained/index.php?page=nuclear_fuel_cycle.

mines, uranium milling involves crushing ore and treating it with chemicals in order to produce U3O8.[32]

In 2018, all domestic uranium concentrate was produced by five ISR facilities located in Nebraska and Wyoming, and one milling operation located in Utah.[33] These facilities were the only operating uranium mines and mill in the U.S. in 2018, thus no uranium concentrate was produced by conventional underground or open-pit mines during the same year. Another five mines are currently licensed, but idled (*see* Figures 3 and 4).[34]

[32] "Conventional Uranium Mills." United States Nuclear Regulatory Commission. https://www.nrc.gov/materials/uranium-recovery/extraction-methods/conventional-mills.html

[33] U.S. Energy Information Administration. *2017 Domestic Uranium Production Report*. (Washington, DC: 2017) https://www.eia.gov/uranium/production/annual/pdf/dupr.pdf.

[34] "Locations of Uranium Recovery Facilities." United States Nuclear Regulatory Commission. https://www.nrc.gov/info-finder/materials/uranium/

Figure 3: U.S. Fuel Cycle Facilities – Mines (In Situ Recovery)			
Project Name	**Company Name**	**Location**	[redacted]
Crow Butte Operation	Cameco	Nebraska	[redacted]
Lost Creek Project	Ur-Energy (Lost Creek ISR LLC)	Wyoming	[redacted]
Smith Ranch-Highland Operation	Power Resource Inc., dba Cameco Resources	Wyoming	[redacted]
Ross CPP	Strata Energy Inc.	Wyoming	[redacted]
Nichols Ranch ISR Project	Energy Fuels Resources Corp. (Uranerz Energy Corporation)	Wyoming	[redacted]
Willow Creek Project (Christenson Ranch & Irigaray)	Uranium One USA, Inc.	Wyoming	[redacted]
Alta Mesa Project	Energy Fuels Resources Corp (Mestena Uranium LLC)	Texas	[redacted]
Hobson ISR Plant	South Texas Mining Venture	Texas	[redacted]
La Palangana	South Texas Mining Venture	Texas	[redacted]
Goliad ISR Uranium Project	Uranium Energy Corp.	Texas	[redacted]
Source: [redacted] U.S. Energy Information Administration – Annual Domestic Uranium Production Report (2018) [redacted]			

Figure 4: U.S. Fuel Cycle Facilities – Mills, 2018			
Project Name	**Company Name**	**Location**	[redacted]
White Mesa Mill	EFR White Mesa LLC	Utah	[redacted]
Shootaring Canyon Uranium Mill	Anfield Resources	Utah	[redacted]
Sweetwater Uranium Project	Kennecott Uranium Company	Wyoming	[redacted]
Pinon Ridge Mill	Western Uranium / Pinon Ridge Resources Corporation	Colorado	[redacted]
Sheep Mountain	Energy Fuels Wyoming Inc.	Wyoming	[redacted]
Source: [redacted] U.S. Energy Information Administration – Annual Domestic Uranium Production Report (2018) [redacted]			

U.S.-based mining and milling facilities have dramatically declined over recent years, falling from eighteen mines and four mills in 2009 to five operating mines and one operating mill in 2018. These facilities have shut down or idled for several reasons, including competition from subsidized foreign imports, low spot prices, as well as costs and delays associated with the U.S. permitting process.

Similarly, production of uranium concentrate (U308) in the United States has declined, dropping 95 percent from 43.7 million pounds in 1980[35] to 1.97 million in 2018. Kazakhstan, Canada, and Australia were the top suppliers in 2017, producing roughly 46.8, 26.2, and 11.8 million pounds of uranium concentrate, respectively.[36]

The third step in the fuel cycle is conversion, where a gas is used to facilitate enrichment of the U-235 isotope in uranium concentrate into natural uranium (UF6). ConverDyn, the sole U.S. uranium conversion facility, is currently in standby/idled (*see* Figure 5).

Figure 5: U.S. Fuel Cycle Facilities – Conversion, 2018

Project Name	Company Name	Location	Operating Status
ConverDyn Metropolis Works	Honeywell Energy/ ConverDyn	Metropolis, IL	Standby/Idle

Source: U.S. Nuclear Regulatory Commission

ConverDyn began producing UF6 for commercial use in the 1960s and supplied commercial conversion services to the U.S. and global uranium market, competing against suppliers in Canada, Russia, France, and China.[37] However, it

[35] "Annual Energy Review 2011." U.S. Energy Information Administration (Washington, DC: 2012). https://www.eia.gov/totalenergy/data/annual/showtext.php?t=ptb0903

[36] "Uranium Production Figures, 2008-2017." World Nuclear Association. http://www.world-nuclear.org/information-library/facts-and-figures/uranium-production-figures.aspx

[37] "Conversion and Deconversion." World Nuclear Association. http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/conversion-and-deconversion.aspx

announced a suspension of operations in late 2017 related to ongoing challenges facing the nuclear fuel industry.[38] [redacted] Furthermore, the Russians, Chinese, and French bundle conversion services as part of their nuclear fuel sales. [redacted][39]

Uranium enrichment, the fourth stage in the fuel cycle, produces material to be used in the operation of nuclear reactors. Natural uranium (UF6) consists of three distinct isotopes: U-234, U-235, and U-238. The enrichment process alters the isotopic makeup in order to increase the prevalence of the U-235 isotope. The U-235 isotope must be enriched so that fission, or splitting of the U-235 atoms, can

[38] U.S. Energy Information Administration. *2017 Domestic Uranium Production Report*. (Washington, DC: 2017) https://www.eia.gov/uranium/production/annual/pdf/dupr.pdf.

[39] [redacted]

occur to produce energy.[40] [41] Gaseous centrifuges are the industry standard for uranium enrichment into low-enriched uranium (LEU) or high-enriched uranium (HEU). LEU is used by commercial power reactors as fuel where the U-235 is enriched to between three and five percent. HEU is used in naval ships, submarines, nuclear weapons, and some research reactors,[42] [43] with enrichment at 20 percent.

The United States first used gaseous diffusion uranium enrichment plants in the 1940s during the Second World War. Additional plants were built in the 1950s for defense needs and later opened for commercial enrichment use. These plants are located in Paducah, Kentucky and Piketon, Ohio, but both closed by 2013.[44] Today, URENCO USA (UUSA) is the only uranium enrichment company operating in the United States, serving the commercial power reactor market. UUSA is a subsidiary of URENCO Group, a consortium owned by the governments of the United Kingdom and the Netherlands, as well as two German

[40] "Uranium Enrichment." United States Nuclear Regulatory Commission. https://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html

[41] "Uranium Enrichment." World Nuclear Association. http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx

[42] "Uranium Downblending." WISE Uranium Project. http://www.wise-uranium.org/eudb.html

[43] Highly Enriched Uranium (HEU) is uranium with U-235 content of at least 20 percent. Naval reactors and weapons applications utilize HEU enriched to more than 90 percent U-235.

[44] "Nuclear Power in the USA." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx

utilities (*see* Figure 6). UUSA employs gas centrifuge enrichment at its Louisiana Energy Services (LES) plant in Eunice, New Mexico to produce LEU for nuclear reactor fuel.[45] Per the 1992 Washington Agreement governing the LES facility's construction and operation, the plant cannot be used to produce enriched uranium for U.S. defense purposes. However, in January 2019, DOE announced plans to reopen the Piketon facility to demonstrate a U.S.-origin centrifuge technology for production of High-Assay Low Enriched Uranium (HALEU) in support of advanced reactor development efforts.[46]

Figure 6: U.S. Fuel Cycle Facilities – Enrichment

Project Name	Company Name	Ownership	Enrichment Type	Location	Operating Status
Louisiana Energy Services (LES)	URENCO USA	United Kingdom, the Netherlands, Germany	Gas Centrifuge	New Mexico	Operating

Source: U.S. Nuclear Regulatory Commission

The fifth and final step in the front-end nuclear fuel cycle is fuel fabrication, where enriched uranium is formed into pellets and then fabricated into fuel rods for fuel assemblies. Three active fuel fabrication plants in the U.S. are licensed to transform low-enriched uranium into fuel assemblies for commercial power reactors: Westinghouse, GE, and Framatome (*see* Figure 7).

[45] "Uranium Enrichment." United States Nuclear Regulatory Commission. https://www.nrc.gov/materials/fuel-cycle-fac/ur-enrichment.html

[46] "DOE Plans $115M Investment in Uranium Enrichment Project." *U.S. News & World Report*, January 8, 2019. https://www.usnews.com/news/best-states/ohio/articles/2019-01-08/doe-plans-115m-investment-in-uranium-enrichment-project

Naval reactors require HEU fuel and their fuel assemblies come from a different supply base. All uranium used in the manufacture of naval fuel assemblies is from the Department of Energy's stockpile and is not currently purchased on the commercial market. The naval fuel is manufactured by BWX Technologies (BWXT) at its Nuclear Fuel Services (NFS) facility in Tennessee. Additionally, BWXT downblends high-enriched uranium (HEU) to produce low-enriched uranium (LEU), which is needed to produce the tritium required for nuclear weapons.[47]

Figure 7: U.S. Fuel Cycle Facilities – Fuel Fabrication, 2018

Company Name	Ownership	NRC Category	Location	Operating Status
BWXT Nuclear Operations Group	United States	Category 1	Virginia	Operating
Nuclear Fuel Services, Inc.	United States	Category 1	Tennessee	Operating
Framatome, Inc.	France	Category 3	Washington	Operating
Global Nuclear Fuel – Americas LLC (General Electric)	United States	Category 3	North Carolina	Operating
Westinghouse	United States	Category 3	South Carolina	Operating

Category 1: High Strategic Significance
Category 3: Low Strategic Significance (commercial services)

Source: U.S. Nuclear Regulatory Commission

B. Summary of U.S. Nuclear Power Generation Industry

The first U.S. commercial nuclear reactor came online in 1958, and most active U.S. reactors were built between 1967 and 1990. Originally certified for 40 years of operation, the lifespans of 85 reactors have been extended by the Nuclear Regulatory Commission (NRC) for an additional 20 years. These certifications

[47] "Nuclear Fuel Fabrication - Current Issues (USA)." WISE Uranium Project.

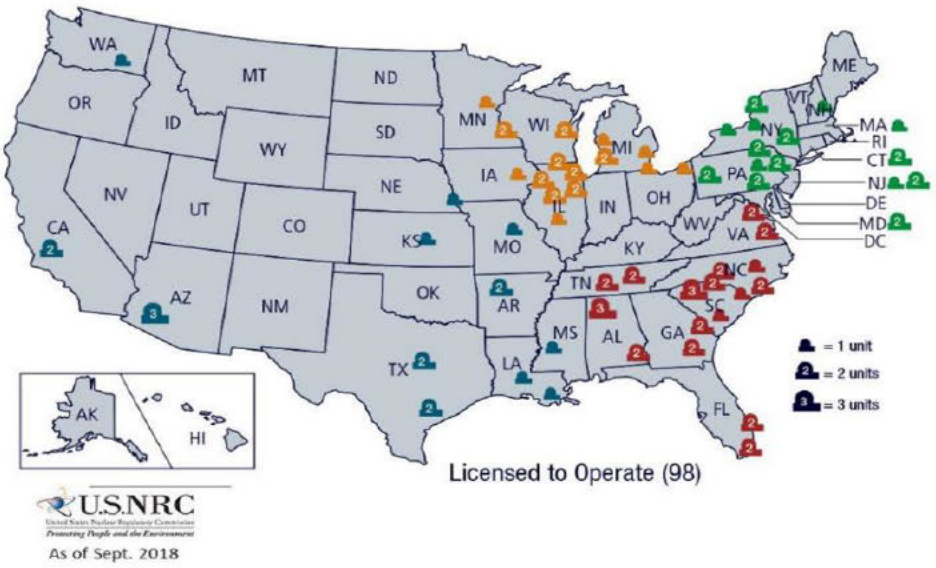
followed assessments confirming that they were safe to continue operating well after the end of their original design life.

As of October 2018, 98 reactors were located at 58 different facilities in 28 states across the country[48] (*see* Figure 8). The two main commercial reactor designs used for power generation are pressurized-water reactors (PWR) and boiling-water reactors (BWR), with 65 and 33 operating in the U.S., respectively. These reactors have varying designs, dimensions, and numbers of fuel rods in each fuel assembly based on the six commercial power reactor manufacturers in the United States: Allis-Chalmers, Babcock & Wilcox, Combustion Engineering, General Atomics, General Electric, and Westinghouse.[49]

[48] "Monthly Energy Review March 2019." U.S. Energy Information Administration. https://www.eia.gov/totalenergy/data/monthly/pdf/sec7_5.pdf

[49] "Fuel Fabrication." United States Nuclear Regulatory Commission. https://www.nrc.gov/materials/fuel-cycle-fac/fuel-fab.html

Figure 8: U.S. Operating Commercial Power Reactors, 2018



Source: U.S. Nuclear Regulatory Commission

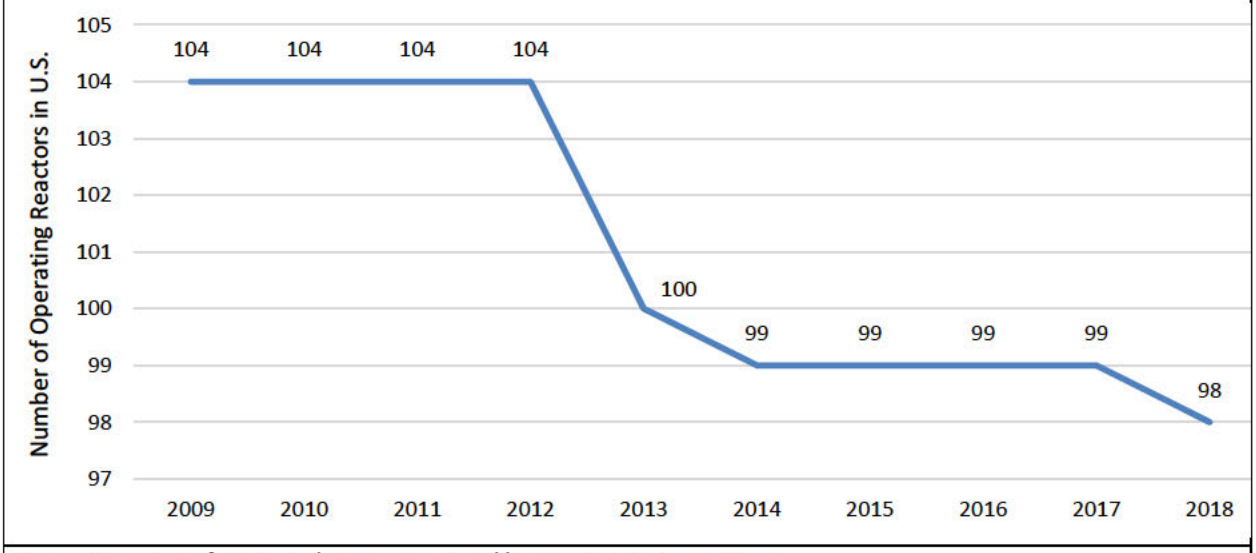
These reactors are important to produce steady-state baseload power to the U.S., in contrast to hydro, solar, and wind, which have fluctuating generating capabilities.[50] [51] Despite providing a significant portion of the nation's electricity (more than 19 percent), a number of U.S. utilities have prematurely retired their nuclear power reactors due to cost pressures resulting from distortions in wholesale electricity market pricing mechanisms, subsidized renewable energy, and lower natural gas prices. Since 2013, U.S. electric utilities have permanently closed six

[50] "Frequently Asked Questions." U.S. Energy Information Administration. https://www.eia.gov/tools/faqs/faq.php?id=207&t=3

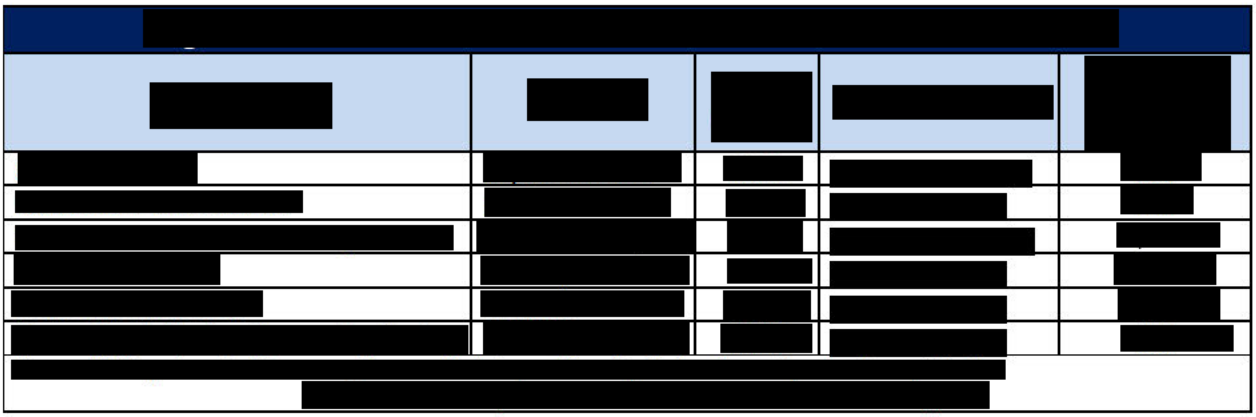
[51] "Nuclear Power in the USA." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx

nuclear power plants. Another eight reactors are slated to be retired between 2019 and 2025.[52] However, two new reactors are scheduled to come online by 2022. The domestic uranium industry is challenged by this shrinking customer demand for their product in the United States (*see* Figures 9 and 10).

Figure 9: U.S. Operating Nuclear Power Reactors, 2009-2018



Source: U.S. Energy Information Administration – Monthly Energy Review, January 2019



[52] U.S. Energy Information Administration. "America's oldest operating nuclear power plant to retire on Monday" (September 14, 2018), https://www.eia.gov/todayinenergy/detail.php?id=37055

The majority of the plants shut down due to cost-driven factors, including competition from alternative generation sources such as natural gas, solar, and wind, as well as additional capital expenditures needed to meet NRC regulatory requirements. [redacted]

Only one new reactor has been completed in the United States since 1996 - Tennessee Valley Authority's Watts Bar 2 plant, which began operating in 2016. Construction started on two commercial PWR reactors in Georgia in 2013 and those are scheduled to begin operation in 2021. In South Carolina, construction of two commercial reactors began in 2013, but cost overruns caused the projects to be abandoned in 2017.[53] [54] While the U.S. nuclear power industry is declining, global demand for nuclear power plants is rising with no less than 50 new reactors under

[53] "Nuclear Power in the USA." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx

[54] Stelloh, Tim. "Construction Halted at South Carolina Nuclear Power Plant." *NBC News,* July 31, 2017. https://www.nbcnews.com/news/us-news/construction-halted-south-carolina-nuclear-power-reactors-n788331

construction in 15 countries. A majority of the new builds are in Russia, China, India, the United Arab Emirates, and South Korea.[55]

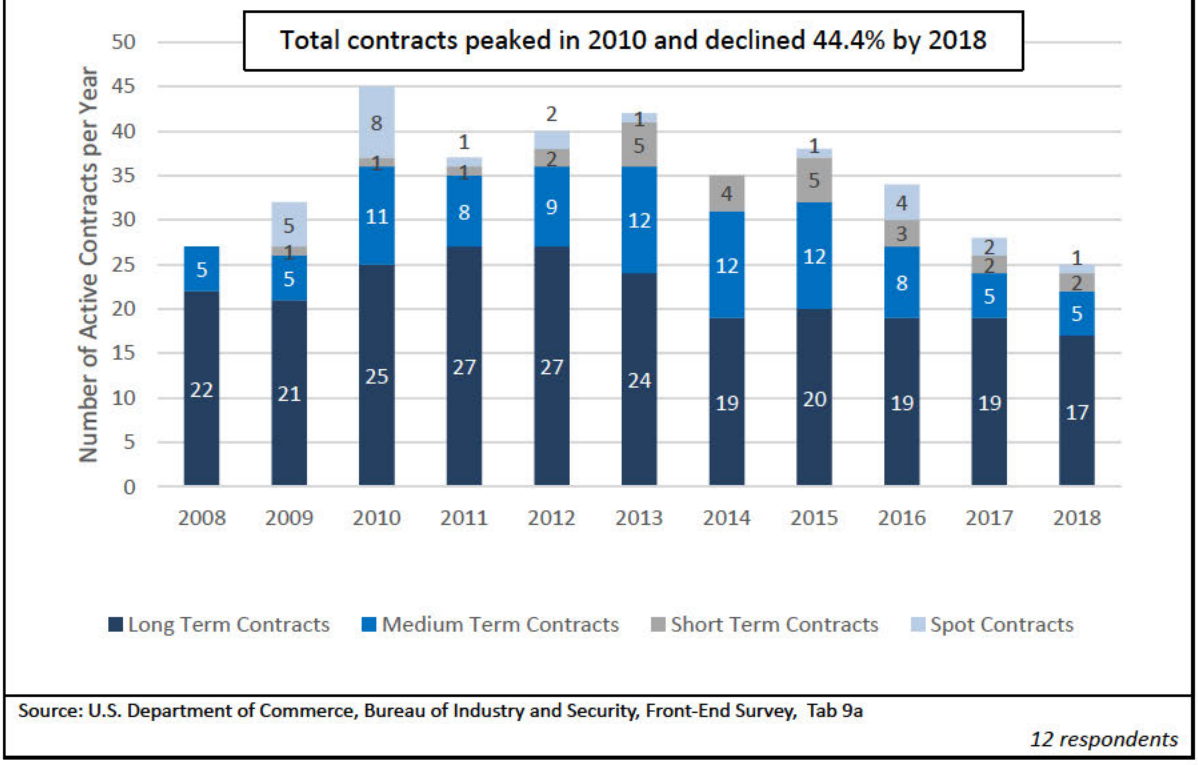
[55] "Plans for New Reactors Worldwide." World Nuclear. http://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx

VI. Global Uranium Market Conditions

A. Summary of the Global Uranium Market

Uranium, in various forms ("uranium"), is a globally-traded commodity supplied primarily through privately negotiated contracts with varying durations. Short-term contracts usually span less than two years, mid-term contracts run between two to five years, and long-term contracts can be in force for five years or more. Additionally, uranium can be bought on "spot," which are contracts with a one-time uranium delivery (usually) for the entire contract, where the delivery occurs within one year of contract execution. The spot market can be lower or higher than the contract market. Since 2011, the number of spot, mid-term, and long-term contracts for all front-end industry participants has varied (*see* Figure 11). Of note, long-term contracts have declined from 35 to just 19, and no short-term contracts were reported.

Figure 11: Total Active Front-End Uranium Contracts by Contract Term



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 9a

12 respondents

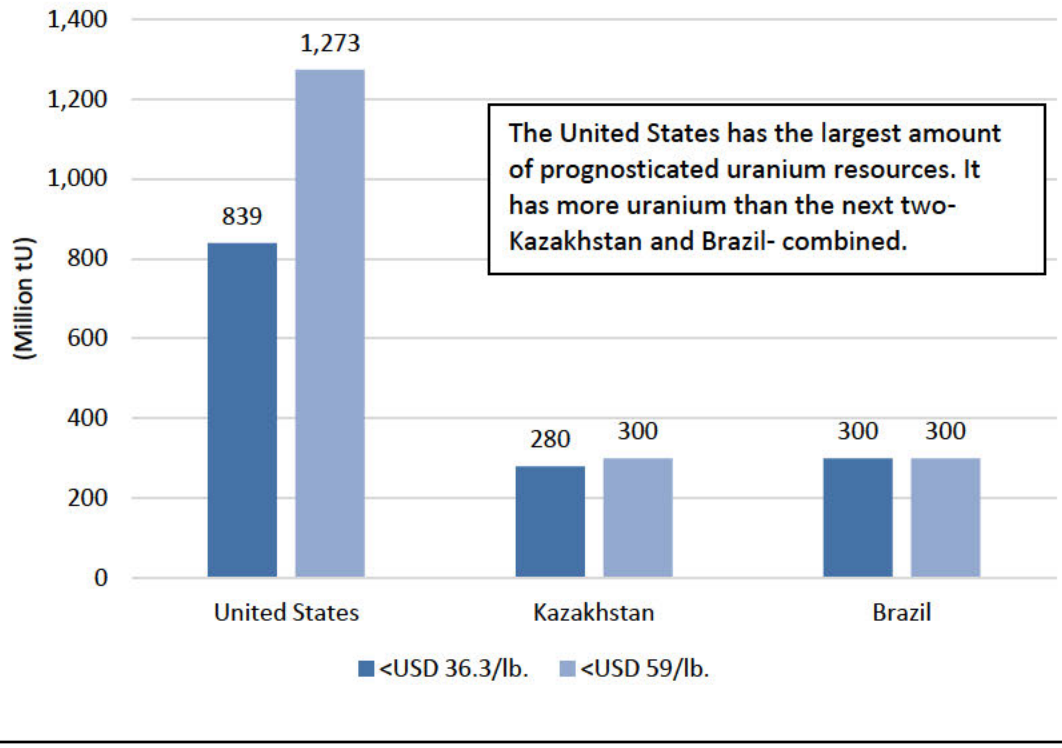
The spot market price of a pound of uranium averaged only $28.27 in the last three months of 2018, and dropped even further to $25.75 in April 2019. This is a 74 percent reduction since the recent price high of $99.24 per pound in 2007.

According to Department survey respondents, the main factor causing the current low spot market price of uranium is global excess uranium supply, much of which is attributed to continued production of uranium from state-owned enterprises in the aftermath of the Fukushima incident. Low spot prices have significantly impacted the viability of U.S. uranium producers. Mining companies operating in the U.S. have been forced to idle operations due to low spot prices,

and since 2009, four companies have closed 10 mines with the intention to permanently halt operations.

Additionally, the U.S. has approximately 1.28 million metric tons of uranium in prognosticated uranium resources (the largest reserves in the world[56]), much of which has not been developed specifically due to low spot prices (*see* Figure 12).

Figure 12: Prognosticated Uranium Resources



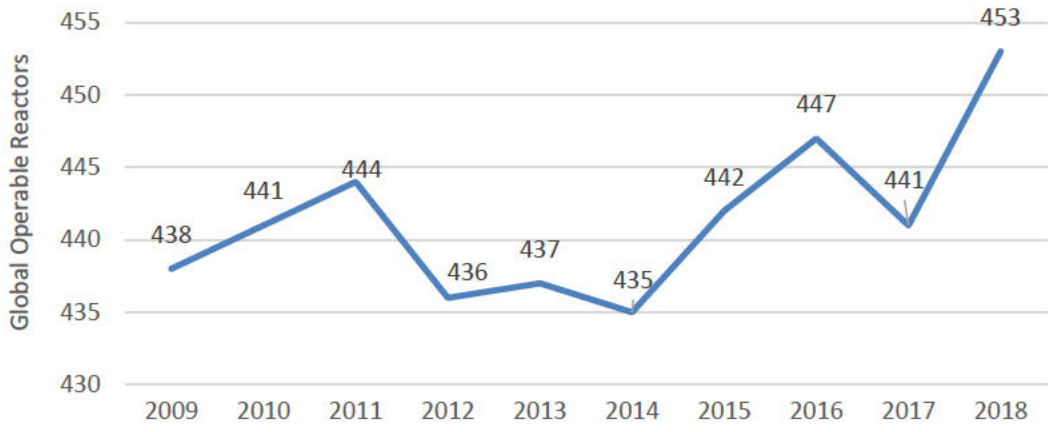
Source: U.S. Geological Survey Critical Analysis of World Uranium Resources (2013)

Nuclear fuel prices are, however, impacted by more than just the uranium spot market price. On the supply side, uranium prices are affected by mine

[56] Susan Hall and Margaret Coleman, U.S. Geological Survey, *Critical Analysis of World Uranium Resources*, (2013) pp. 26-27

closures and the release of existing inventory for sale. On the demand side, price is impacted by new reactor startups and reactor closures (*see* Figure 13).

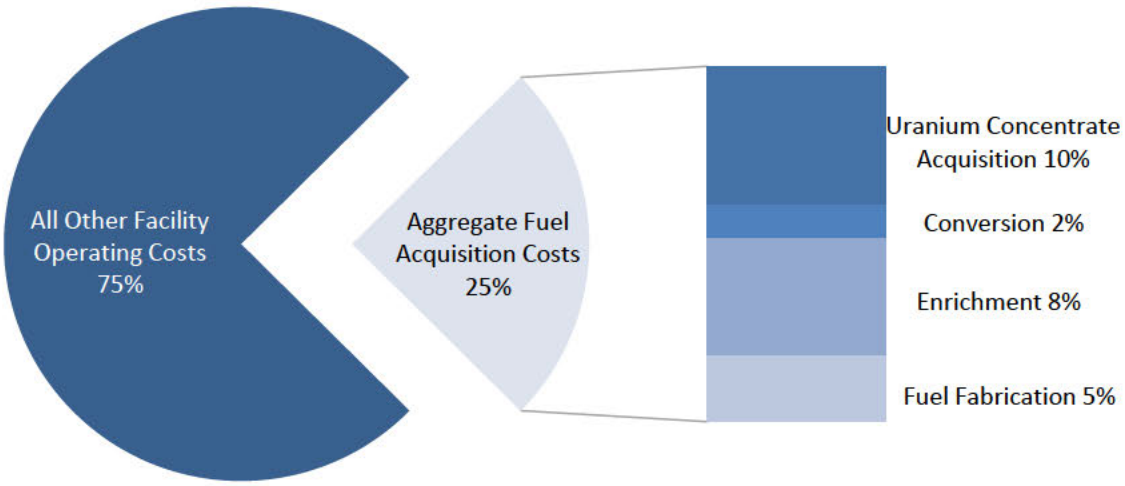
Figure 13: Global Commercial Operating Reactors, 2009-2018



Source: International Atomic Energy Agency – Unit Capability Trend Report January 2019 and "Current Status" Page.

Additionally, converters, enrichers, and fuel fabricators experience specific market pressures, resulting in uranium products that have slightly different price considerations. Department survey data indicates that, on average, aggregate fuel acquisition accounts for 25 percent of total facility operating costs. When looking at fuel acquisition as a percentage of a nuclear power utilities' total facility operating costs, the contribution of each stage of the front-end nuclear fuel cycle is relatively small: mining/milling and uranium concentrate acquisition (10 percent), enrichment (8 percent), fuel fabrication (5 percent), and conversion (2 percent) (*see* Figure 14).

Figure 14: Fuel Acquisition as a Percentage of Total Facility Operating Costs



Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Operator Survey, Q3C *22 Respondents*

B. Uranium Transactions: Book Transfers and Flag Swaps

Unlike many commodities, exchanges of uranium between suppliers and customers often take place without physical movement of material. This occurs through book transfers and flag swaps.

Book Transfer

For the purposes of this investigation, a book transfer is defined as a "change of ownership of two quantities of material with all other characteristics of the material being unchanged."[57] Book transfers are used to exchange material

[57] *Swaps in the International Fuel Market*, 7. World Nuclear Association. http://www.world-nuclear.org/uploadedFiles/org/WNA/Publications/Working_Group_Reports/swaps-report-2015.pdf, 7.

between two customers at a third-party producer without having to physically ship or otherwise move material (*see* Figure 15).

Figure 15: Example of Book Transfer

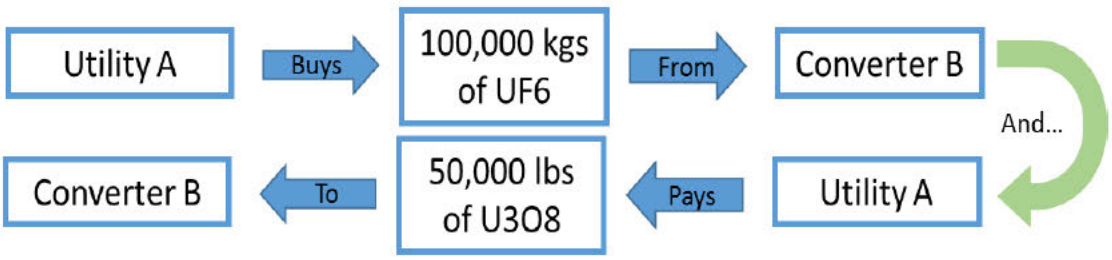
	Utility A	Mine B
Before	**Where (Account Location)**: Converter C, USA **What (Contract)**: Buy 100,000 pounds of U3O8 from Mine B. **Where (U3O8 Origin):** Not yet purchased	**Where (Account Location)**: Converter C, USA **What (Contract)**: Provide 100,000 pounds of U3O8 to Utility A. **Where (U3O8 Origin):** Country D
What Happens: Mine B already has 100,000 pounds of U3O8 in Converter C's Account Mine B Transfers U3O8 at Converter C to Utility A		
After	**Account Location**: Converter C, USA **Contract**: Buy 100,000 pounds of U3O8 from Mine B. **U3O8 Origin:** Country D	**Account Location**: Converter C, USA **Contract**: *Transfer 100,000 pounds of U3O8 at Converter C to Utility A's account* **U3O8 Origin:** Country D

NOTE: In this example, 100,000 pounds of U308 has changed ownership from Mine B to Utility A, but retains its origin from Country D.

Source: U.S. Department of Commerce, Bureau of Industry and Security

Book transfers also can be used to convey payment for conversion or enrichment services (*see* Figure 16).[58]

Figure 16: Payment for Conversion Services via Book Transfer



Source: U.S. Department of Commerce, Bureau of Industry and Security

[58] Ibid.

Flag Swap

In certain cases, utilities and uranium industry producers may find it necessary to conduct "obligation swaps" of material, a practice commonly known as "flag swapping."[59] In the uranium industry, obligations are defined as conditions assigned by a particular country's government to a specific set of nuclear material. These conditions control the use of nuclear material, including uranium, and may restrict where it is shipped. For example, if such material has a United States obligation, the material can only be used in accordance with conditions established by the United States government.[60]

Depending on the parties involved in the uranium exchange, it is possible for a given quantity and type of uranium to acquire multiple obligations. If material is mined in Canada, converted in the United States, enriched in Germany, and fabricated into nuclear fuel in Japan, then the uranium would then acquire obligations from Canada, the United States, the European Atomic Energy

[59] "Swaps in the International Fuel Market." World Nuclear Association. (2015). http://www.world-nuclear.org/uploadedFiles/org/WNA/Publications/Working_Group_Reports/swaps-report-2015.pdf

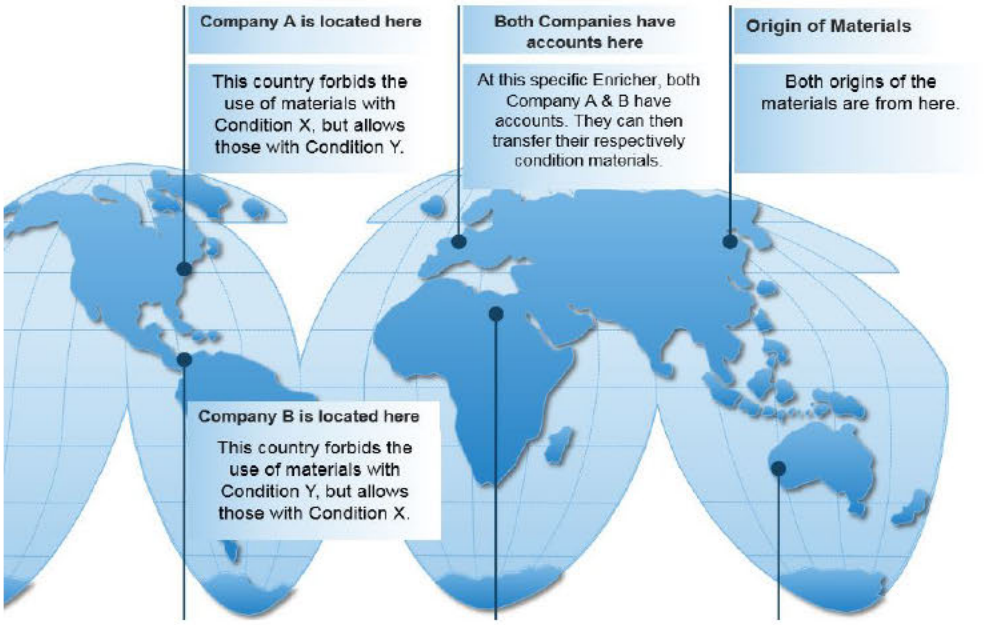
[60] In this example, the United States obligations associated with material are established in U.S. peaceful nuclear cooperation agreements, also known as 123 agreements. Section 123 of the Atomic Energy Act of 1954 generally requires the entry into force of a peaceful nuclear cooperation agreement prior to significant exports of U.S. nuclear material or equipment. As of 2019, the United States has in force approximately 23 of these agreements with foreign partners.
Congressional Research Service. *Nuclear Cooperation with Other Countries: A Primer*, 1. (Washington, DC: 2019). https://crsreports.congress.gov/product/pdf/RS/RS22937

Community (EURATOM), and Japan. The uranium can only be used in accordance with regulations imposed by the above countries and EURATOM. Customers and producers engage in obligation swaps to ease administrative burdens on the maintenance of material. By exchanging in obligation swaps, customers and producers can minimize the number of obligations that must be adhered to for the tracking and ultimate use of uranium materials (*see* Figures 17 and 18).

Note that the exchange of obligations does not change the origin. Although origin swaps are usually not permitted by regulatory authorities, it is possible to *de facto* origin swap through a change of obligation and ownership. These combination obligation/ownership swaps have in the past been used to circumvent uranium import restrictions, as previously encountered with South African and Soviet-origin uranium in the late 1980s.[61]

[61] In these cases, South African and Soviet producers used third-party brokers to facilitate origin swaps that would circumvent restrictions on imports of these materials. DOC 1989 investigation, also, Written Question by Mr. Paul Saes (V) to the Commission of the European Communities, 26 February 1990, http://publications.europa.eu/resource/cellar/a6838643-4b6d-4f39-aebb-d538ff795091.0004.01/DOC_1

Figure 17: Obligation Swap, Example 1



NOTE: Company A has 50,000 pounds of UF6 with Obligation X. Company B has 50,000 pounds of UF6 with Obligation Y. Both quantities of UF6 have Origin P.

Source: U.S. Department of Commerce, Bureau of Industry and Security

Figure 18: Obligation Swap, Example 2

Source: U.S. Department of Commerce, Bureau of Industry and Security

Book transfers and flag swaps are also advantageous because of the specialized nature of the nuclear fuel cycle. Nuclear fuel facilities are concentrated in only a few countries: five nations have uranium conversion facilities (the United States, Canada, China, France, and Russia) and eight enrichment facilities[62] (the aforementioned countries as well as Germany, the United Kingdom, and the

[62] Ibid.

Netherlands). Consequently, book transfer and flag swaps ensure that converters and enrichers can quickly process customer orders.

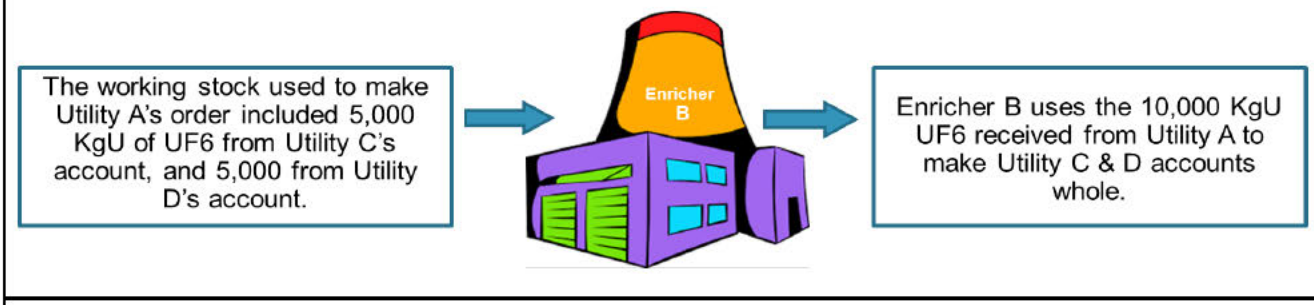
Furthermore, the nature of the uranium industry's manufacturing processes mean that an individual company's inventories of material are not kept separately at their facilities. Instead, materials are stored at converters, enrichers, and fuel fabricators (*see* Figures 19 and 20).[63] At these facilities, customers are assigned a particular share of the facility's product proportional to the amount specified in their contract. In this sense, uranium industry transactions function in the same way as banking transactions. An individual bank customer withdrawing $100 from an ATM does not receive the same physical $100 that he or she deposited at an earlier point. Similarly, a utility customer does not receive an end product – whether UF6, SWU, or fabricated fuel assemblies – to be the source material that the utility supplied to the producer.

Figure 19: Reconciliation of Book Transfer Accounts, Example 1

Source: U.S. Department of Commerce, Bureau of Industry and Security

[63] Ibid.

Figure 20: Reconciliation of Book Transfer Accounts, Example 2



Source: U.S. Department of Commerce, Bureau of Industry and Security

The Department incorporated its understanding of book transfers and flag swaps to its survey instrument and interpretation of responses. The Department is particularly cognizant of the reality that many imports of uranium into the United States do not necessarily occur through physical transportation of materials into the country. As described above, U.S. uranium producers and U.S. utilities can acquire and exchange materials without them ever entering the country. Consequently, the Department accounts for these types of transfers in assessing the overall impact of imported uranium on the national security.

C. The Effect of the Fukushima Daiichi Incident on U.S. and Global Uranium Demand

Reduction in global uranium demand in recent years can be traced to several factors including the impacts of Japan's Tōhoku earthquake and the subsequent meltdown at the Fukushima Daiichi Nuclear Power Plant. This event profoundly affected the economics of the nuclear industry by reducing global demand for uranium. Some governments in the developed world reacted to the Fukushima incident by closing existing reactors and cancelling plans for new construction.

Japan cancelled plans for 14 new reactors and shut down all 50 operable reactors by 2012 to reassess safety standards. Since then, only nine have restarted.[64] Germany decided to shut down all 17 of its reactors by 2022[65] and France announced plans to shut down 14 reactors by 2035.[66] As of 2019, Germany has closed 10 reactors, while France has not yet closed any.[67] Consequently, the global uranium market was flooded with uranium products after a significant reduction in nuclear power plants operating worldwide.

Twelve projects primed for construction in the United States, encompassing seventeen new nuclear reactors, were canceled/postponed following the post-Fukushima upgrades mandated by the Nuclear Regulatory Commission. The new NRC requirements, coupled with the resurgence in public opposition to nuclear power, have been deterrents to future construction. Intense competition from other energy generation methods, paired difficulties in securing financing, also increased costs of new construction (*see* Figure 21). The number of active nuclear power plants worldwide reached a low in 2014 of 435 operating reactors. Although the

[64] "Nuclear Power in Japan." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx

[65] Annika Breidthart, "German government wants nuclear exit by 2022 at latest", Reuters (May 30, 2011), https://uk.reuters.com/article/idINIndia-57371820110530

[66] "Nuclear Power in France." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/france.aspx

[67] "Nuclear Power in Germany." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/germany.aspx

number of reactors has since increased to 453 in 2018, the oversupply of uranium that remains in the market has continued to depress global prices.

Figure 21: Cancelled Nuclear Projects Since 2009

Facility Name	Location	Projected Generation Capacity	Date of Cancellation	Reason for Cancellation
Bellefonte 2-4	Hollywood, AL	3,435 MW	August 2009	Unfavorable market conditions
Victoria County Station	Victoria, TX	3,070 MW	August 2012	Unfavorable market conditions, competition from natural gas
Shearon Harris 2-3	New Hill, NC	2,017 MW	May 2013	Regulatory concerns, unfavorable market conditions
Comanche Peak 3-4	Glen Rose, TX	3,400 MW	November 2013	Delay in reactor design review
Nine Mile Point 3	Scriba, NY	1,600 MW	November 2013	Unfavorable market conditions
Calvert Cliffs 3	Lusby, MD	1,600 MW	July 2015	Unfavorable market conditions, inability to secure financing
Callaway 2	Steedman, MO	1,600 MW	August 2015	Regulatory concerns, unfavorable market conditions
Grand Gulf 3	Port Gibson, MS	1,520 MW	September 2015	Unfavorable market conditions
River Bend 3	St. Francisville, LA	1,520 MW	December 2015	Unfavorable market conditions
Bell Bend 1	Salem Twp., PA	1,600 MW	August 2016	Suspension of reactor design certification
Bellefonte 1	Hollywood, AL	1,100 MW	May 2016	Unfavorable market conditions
V.C. Sumner 2-3	Jenkinsville, SC	2,500 MW	July 2017	Unfavorable market conditions, cost overruns
Levy County Nuclear Power Plant	Levy County, FL	2,234 MW	August 2017	Unfavorable market conditions, public opposition

Source: U.S. Nuclear Regulatory Commission

D. The Effect of State-Owned Enterprises on Global Uranium Supply

The business practices of state-owned enterprises (SOEs) cause significant challenges for U.S. uranium producers. SOEs are insulated from market pressures in which the U.S. and other market producers, namely those in Australia and Canada, must contend. Specifically, a steep drop in uranium spot market prices can adversely affect miners' ability to cover their operating costs. In contrast, SOEs often produce uranium regardless of price because state support enables

SOEs to make business decisions insensitive to market conditions. For example, although global uranium production declined by six percent between 2012 and 2014, Kazakhstan's production of uranium increased by seven percent over the same time period.[68] In Kazakhstan's case, state support includes state-financed exploration services[69] and employee training, as well as currency devaluation to artificially depress prices of all exports, including uranium.[70] State-owned suppliers dominate the list of leading global uranium producers (*see* Figure 22).

[68] IAEA Red Book, 102, 2016

[69] Global Business Reports, "Kazakhstan's mining industry: Steppe by Steppe", *Engineering and Mining Journal* (September 2015), p. 83, https://www.gbreports.com/wp-content/uploads/2015/09/Kazakhstan_Mining2015.pdf

[70] In August 20, 2015 the National Bank of Kazakhstan allowed the national currency – the tenge – to float freely. Immediately, the tenge fell in value. Before the transition, the tenge had limited ability to move within a range determined by the national bank, resting at 185.7 KZT per USD. With the introduction of a free floating exchange rate, the currency has been consistently devaluing and resides at 380.1 KZT per USD (Department of Treasury). The switch to a free floating exchange rate was motivated in part to an effort to prop-up Kazak oil and resource sectors. The transition has successfully boosted growth in mining and resource markets. For more, consult Andrew E. Kramer, "Kazakhstan's Currency Plunges", *New York Times* (August 20, 2015) https://www.nytimes.com/2015/08/21/business/international/kazakhstans-currency-plunges.html

Figure 22: Leading Global Uranium Producers			
Company	Ownership	Uranium Production (in tons of MT)	Global Market Share (%)
KazAtomProm	Kazakhstan	12,093	20
Cameco	Private	9,155	15
Orano	France	8,031	13
Uranium One	Russia	5,102	9
CNNC & CGN	China	3,897	7
ARMZ	Russia	2,917	5
Rio Tinto	Private	2,558	4
Navoi	Uzbekistan	2,404	4
BHP Billiton	Private	2,381	4
Energy Asia	Private	2,218	4
General Atomics/ Quasar	Private	1,556	3
Sopamin	Niger	1,118	2
Paladin	Private	970	2
Red = State Ownership Black = Private Ownership			
Source: World Nuclear Association - World Uranium Mining Production, 2017			

The leading global uranium producers account for about 92 percent of current world uranium production. Of these, SOEs in the former Soviet Union and China control about 45 percent of the global market. These companies are insulated from market and regulatory pressures experienced by market producers, placing U.S. uranium mines at a distinct disadvantage.

Uranium-related SOEs, however, have broader roles than sales of uranium products. Many countries leverage their SOEs' integration of the nuclear fuel cycle and nuclear power generation to further geopolitical ambitions. Rosatom, a Russian state-owned enterprise that participates in every step of the nuclear fuel cycle, including power generation, uses this leverage. With virtually complete control over the Russian nuclear industry, Rosatom can offer prices for nuclear plant construction and fuel services that are significantly below that of market-

based suppliers. Generous financing packages, usually consisting of low-cost loans underwritten by the Russian government, also incentivize deals with Rosatom.[71] China emulates Rosatom's model of pairing subsidized nuclear construction with state-supported financing, as seen with its construction of reactors in Pakistan and Romania. Summaries of individual countries' non-market economy nuclear activities are discussed more in Appendix I.

Uranium-related SOEs also have a deleterious impact on U.S. nonproliferation objectives. U.S. exports of nuclear technologies and supplies, including uranium products, are generally governed by Section 123 agreements.[72] These agreements, which include peaceful use restrictions and other nonproliferation requirements, ensure that the U.S. nuclear industry can play a role in the global nuclear fuels trade without contributing to nuclear weapons development. However, if the U.S. uranium industry cannot compete with SOEs, particularly Russia and China, the U.S. contribution to global nuclear

[71] Russia has recently finished construction of Iran's only operating nuclear reactor at Bushehr, and Rosatom is the sole fuel supplier for the plant. Rosatom is also actively constructing the Akkuyu nuclear plant in Turkey, and is pursuing projects in Finland, Hungary, Bangladesh, Egypt and Belarus. http://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx

[72] "Nuclear Cooperation with Other Countries: A Primer." Congressional Research Service. (January 15, 2019). https://fas.org/sgp/crs/nuke/RS22937.pdf

nonproliferation regimes will substantially diminish. As former Secretary of Energy Enest Moniz remarked in July 2017:

> "A world in which Russia and China come to have dominant positions in the global nuclear supply chain will almost certainly see a weakening of requirements, just as nuclear technology and materials spread to many countries."[73]

U.S. utilities contract with uranium-related SOEs in Russia, Kazakhstan, Uzbekistan, and China primarily because of concerns with price and diversity of supply. These utilities believe that with the limited number of worldwide uranium producers, particularly in the conversion and enrichment stages, any additional competition is welcome. Most of the 24 utility respondents indicated that price and reliability of delivery considerations were the chief drivers of their fuel procurement policies; only [redacted] alluded to geopolitical considerations as a significant factor. Domestic utilities' desire to cut costs includes support for increased market penetration by China. [redacted]

[73] Ernest J. Moniz, "The National Security Imperative for U.S. Civilian Nuclear Energy Policy", *Energy Futures Initiative* (July 12, 2017), https://energyfuturesinitiative.org/news/2017/7/12/moniz-the-national-security-imperative-for-us-civilian-nuclear-energy-policy

Utilities' emphasis on diversity of supply also underpins their rationale for purchasing Russian uranium. [redacted] Several utilities suggested that if current restrictions on Russian imports were eliminated, they would purchase more Russian material.[75]

France

Respondents have also raised concerns about the activities of French state-owned enterprises. There are two principal French companies participating in the nuclear fuel cycle: Orano and Framatome. Orano, previously a part of Areva SA, is minority-owned by the French state and has direct ownership of uranium mines in Niger, Kazakhstan, and Canada. It also owns and operates all uranium enrichment and conversion facilities in France. Framatome, which is majority owned by the French government's electric utility *Électricité de France*, operates fuel fabrication and reactor construction businesses.

[74] [redacted]

[75] Commerce Department Survey of U.S. Nuclear Power Generation Sector, 2019

U.S. producers acknowledge that state support gives Orano and Framatome a competitive edge over U.S. and other European firms. [redacted] expressed concerns that, if U.S. anti-dumping duties on French enriched uranium were lifted, Orano's state backing would allow it to sell to utilities below-market cost.

The U.S. International Trade Commission has previously concluded that French state-owned enterprises have undersold U.S. producers of enriched uranium (*see* Chapter VII). Unlike SOEs in Russia, Kazakhstan, Uzbekistan, and China, French nuclear entities are partially owned by private companies and are somewhat subject to market pressures. Furthermore, the French nuclear market is not closed off to the U.S. or other uranium producers, and U.S. companies reported sales to France between 2014 and 2018. In contrast, U.S. uranium producers cannot sell into the Russian or Chinese markets, as these countries are served only by their state-owned enterprises.

E. Market Uranium Producers: Canada and Australia

Market uranium producers in Canada and Australia have historically performed better than their U.S. counterparts. Between 2014 and 2016, Canada and Australia increased their production of uranium by 59 percent and 26 percent, respectively.[76] In 2014, Canada opened the Cigar Lake mine and Australia opened the Four Mile mine,[77] both increasing overall production numbers.

These mines also exhibit positive geologic factors. Cigar Lake has an average ore grade of 14.5 percent uranium, one of the highest in the world. Higher ore grades require less processing to recover uranium from the ore, reducing overall production costs. Australia's largest mine, Olympic Dam, is also a significant producer of copper, gold, and silver.[78] Production of these commodities can therefore support continued uranium extraction even in the face of lower global spot prices.

Despite these geologic advantages, Canadian and Australian producers are also subject to the same market pressures caused by SOEs' overproduction. For example, McArthur River, estimated to have the world's largest deposit of high-

[76] Nuclear Energy Agency & International Atomic Energy Agency. *Uranium 2018- Resources, Production and Demand*, 55. 2018. http://www.oecd-nea.org/ndd/pubs/2018/7413-uranium-2018.pdf

[77] Ibid.

[78] Ibid., 134.

grade uranium,[79] was idled in November 2017 by Cameco Resources due to poor economic conditions.[80] Australian mines have also cut production in response to poor market conditions between 2016 and 2018, most notably Olympic Dam cut production by eight percent and the Ranger mine by 10 percent.[81] As a result, between 2014 and 2018, 24.2 percent of uranium concentrate provided by Australian and Canadian companies to U.S. nuclear power generators came from Kazakhstan and Uzbekistan.[82]

Like their U.S. counterparts, Canadian and Australian producers cannot produce without regard for spot market price. SOEs' continued price-insensitive production therefore threatens all market uranium producers, including the U.S., Canada, and Australia.

[79] Ibid., 159.

[80] "Cameco: uranium prices too low to restart McArthur River mine operation." *MRO Magazine*, August 3, 2019. https://www.mromagazine.com/2018/08/03/cameco-uranium-prices-too-low-to-restart-mcarthur-river-mine-operation/

[81] "Australia's Uranium Mines." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/appendices/australia-s-uranium-mines.aspx

[82] U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Question 9

VII. Findings

A. Uranium is Important to U.S. National Security

As discussed in Part II, "national security" under Section 232 includes both (1) national defense and (2) critical infrastructure needs.

1. Uranium is Needed for National Defense Systems

An assured supply of U.S.-origin uranium is critical to national defense for the purpose of nuclear weapons and the naval fleet. Nuclear reactors provide propulsion and electricity for key elements of the nation's naval fleet: 11 aircraft carriers and 70 submarines. Uranium is also vital for producing tritium, a radioactive gas used in U.S. nuclear weapons.

Many international nuclear cooperation agreements to which the United States is a party, including Section 123 agreements on civil nuclear cooperation, restrict the use of nuclear material imported under those agreements to peaceful uses. The United States requires U.S.-origin uranium and nuclear technologies for use in the production of uranium-based products for U.S. defense systems, with no foreign obligations that restrict the uses of such nuclear material.[83] At this time, there is only one functional enrichment facility in the United States. Located in Eunice, New Mexico and operated by the British-German-Dutch consortium URENCO,

[83] U.S. Department of Energy. *Tritium And Enriched Uranium Management Plan Through 2060*, iv. Report to Congress. (Washington DC: 2015) http://fissilematrials.org/library/doe15b.pdf

this enrichment facility may only enrich uranium for civil purposes; the material it produces may not be used for U.S. nuclear weapons or naval reactors.[84]

However, the U.S. has three defense systems that require highly-enriched uranium (HEU) (*see* Figure 23). The Department of Energy currently meets requirements for HEU by drawing on its stockpile. DOE also satisfies its ongoing need for HEU by recycling components from retired nuclear weapons. DOE is estimated to have approximately 575 tons of HEU and 80.8 tons of plutonium. Russia, in contrast, has an estimated 679 tons of HEU and 128 tons of plutonium.[85]

Figure 23: Defense Requirements for U.S.-Origin Uranium-Based Products

Submarines (70) – HEU Fuel	Nuclear-Powered Aircraft Carriers (11) – HEU Fuel	Tritium Nuclear Weapons 3,800 +/- *

*Includes 1,700 warheads on missiles and strategic bombers; 2,100 warheads in reserve; 150 warheads in Europe. An additional 2,500 warheads are slated for dismantlement.
Sources: U.S. Navy, International Panel on Fissile Materials (www.fissilematerials.org)
See Appendix J for entire chart

Furthermore, U.S.-origin uranium with no foreign obligation is required for the manufacture of tritium for defense purposes (*see* Figure 24). Tritium, a hydrogen isotope, is used in nuclear warheads to boost explosive yield. Tritium must be continually replenished in warheads because it has a short half-life of 12.3

[84] Agreement Between the Three Governments of the United Kingdom of Great Britain and Northern Ireland, the Federal Republic of Germany and the Kingdom of the Netherlands and the Government of the United States of America Regarding the Establishment, Construction and Operation of an Uranium Enrichment Installation in the United States, Washington, 24 July 1992, Treaty Series No 133 (2000).

[85] U.S. Department of Energy. *Tritium And Enriched Uranium Management Plan Through 2060*. Report to Congress. (Washington DC: 2015) http://fissilematrials.org/library/doe15b.pdf

years, decaying at a rate of 5.5 percent per year. The Department of Energy has an Interagency Agreement with the Tennessee Valley Authority (TVA) for production of tritium using the TVA's Watts Bar 1 commercial power reactor. TVA's Watts Bar 2 commercial power reactor will soon be used for tritium production as well.[86]

Figure 24: Uranium Requirements for U.S. National Defense

Material	Defense Application	Other Application
Natural Uranium (NU)	Enrichment	Materials Research Reactors
Low Enriched Uranium (LEU)	Tritium Production for Nuclear Weapons	Medical Isotope Production
Highly Enriched Uranium	Reactor Fuel for Aircraft Carriers and Submarines	U.S. High Performance Research Reactors
Depleted Uranium U-235	Munitions – Kinetic Energy Penetrators	Mixed-Oxide Reactor Fuel
	Munitions – Armor	Triuranium Octoxide (U3O8)
	Radiation Shielding	Uranium Hexafluoride (UF6)
	Targets for Pu-239 Production	Aircraft Parts

Source: U.S. Department of Commerce, Bureau of Industry and Security; U.S. Department of Energy, February 2019

Low-enriched uranium (LEU)[87] is used to produce tritium and to supply fuel to U.S. research reactors. DOE meets some of its internal demands for LEU by downblending HEU into LEU.[88] DOE uses a bartering program of uranium derived from HEU as payment for services to defray cleanup costs at the

[86] February 2019 discussion between U.S. Department of Energy, National Nuclear Security Administration, Office of Major Modernization Programs and the U.S. Department of Commerce, Bureau of Industry and Security.

[87] Low-enriched uranium (LEU) is uranium enriched to less than 20% U-235. (Uranium used in power reactors is usually 3.5 - 5.0% U-235). High-enriched uranium (HEU) is uranium enriched to 20% U-235 or more. (Uranium used in weapons is about 90% enriched U-235.)

[88] For the purposes of this 232 investigation, downblending is the reduction of uranium enrichment levels to less than 20 percent, a low enriched uranium (LEU), which cannot be used in weapons, but is suitable for use as fuel in nuclear power plants and naval nuclear reactors.

Portsmouth Gaseous Diffusion Plant in Piketon, Ohio.[89] The downblending practice also provides high assay low-enriched uranium (HALEU),[90] which is used in research reactors and medical isotope production reactors.

Lastly, DOE's downblending program for production of LEU fuel used in TVA reactors requires a supply of natural uranium trioxide (UO3) to be used as a diluent in the downblending process. As of 2019, there is no U.S. production of UO3; consequently, TVA has to import it from Canada and swaps unobligated flags from DOE stocks of natural uranium in other physical forms. DOE does not maintain a stockpile of unprocessed uranium of any type. Furthermore, the stockpile of HEU allocated to production of HALEU is expected to be depleted by 2060[91] and DOE's supply of LEU will be exhausted around 2041. The Department anticipates that its HEU stockpile, at current projected rates of consumption for naval reactor operations, will be depleted between 2050 and 2059.[92]

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[89] U.S. Government Accountability Office. *Nuclear Weapons: NNSA Should Clarify Long-Term Uranium Enrichment Mission needs and Improve Technology Cost Estimates, Report to Congressional Committees.* 14. [GAO-18-126], February 2018. https://www.gao.gov/products/GAO-18-126

[90] High assay low-enriched uranium (HALEU) – Low-enriched U-235 uranium product that has enrichment levels higher than the 3.5-5%. HALEU U-235 uranium product can have enrichment levels approaching 20%, depending on the application.

[91] U.S. Department of Energy, National Nuclear Security Administration, Office of Major Modernization Programs, February 2019 discussion with the U.S. Department of Commerce, Bureau of Industry and Security.

[92] "Estimate of Global HEU Inventories as of January 2017." International Panel on Fissile Materials. http://fissilematerials.org

The National Nuclear Security Administration maintains the American Assured Fuel Supply (AFS), which is a stock of low-enriched uranium for use by U.S. and foreign utilities during a serious fuel supply disruption.[93] The AFS contains 230 tons of LEU that was downblended from DOE's HEU stockpile.[94] This stock is not available for use by DOE/NNSA. Only civilian nuclear power plant operators may use the AFS.

U.S. national security relies on credible nuclear deterrence. A shortage of HEU to fuel aircraft carriers and submarines and LEU to support tritium production would undermine U.S. defense operations and readiness. Likewise, an inability to supply HALEU to research reactors and medical isotope manufacturers would be detrimental to several critical infrastructure sectors.[95] The supply of U.S.-mined uranium will be critical as a feedstock for producing LEU and HEU in an enrichment facility that is planned to serve national defense needs. Without economically viable uranium mining operations in the United States, the enrichment of nuclear materials for DOE defense missions will not be possible

[93] In 2005, the U.S. Department of Energy set up the American Assured Fuel Supply (formerly Reliable Fuel Supply) with $49.5 million in funding from Congress. This entity supports the International Atomic Energy Agency's International Fuel Bank initiative – a back-up source of uranium for global supply disruptions.

[94] U.S. Department of Energy. *Notice of Availability: American Assured Fuel Supply*, Federal Register 76 no. 160, August 18, 2011, 51358.

[95] U.S. Department of Energy. National Nuclear Security Administration. *Report to Congress: Fiscal Year 2019 Stockpile Stewardship and Management Plan – Biennial Plan Summary.* (Washington, DC: 2018). https://www.energy.gov/sites/prod/files/2018/10/f57/FY2019%20SSMP.pdf

under present law and policies. Defense needs for uranium are not enough to financially sustain the U.S. front-end uranium industry.

Future Defense Needs: Microreactors

DoD is pursuing the deployment of small modular reactors and microreactors that will require HALEU fuel as early as 2027. DoD microreactors may require fuel that is free from peaceful use restrictions, including the peaceful use restrictions that are generally applied by foreign suppliers of nuclear material to the United States. The 2019 National Defense Authorization Act requires the Secretary of Defense to issue requirements for a pilot program to design, test, and operate micro-reactors by December 31, 2027.[96]

DoD's need for microreactors stems from its facilities' reliance on commercial electric power. At present, DoD installations consume 21 percent of total federal energy consumption in the United States, at a cost of approximately $3.7 billion per year. Fifty-three percent of all energy consumed by DoD is delivered as electricity, 99 percent of which is provided via the commercial grid.[97]

[96] For this report, micro-reactors are defined as reactors generating no more than 50 megawatts (MWe) Section 327, John S. McCain National Defense Authorization Act 2019 (P.L. 115-233), https://www.congress.gov/bill/115th-congress/house-bill/5515/text?format=txt

[97] Defense Science Board. Department of Defense. "*Report of the Defense Science Board Task Force on DoD Energy Strategy, More Fight - Less Fuel," 2.* (Washington, DC: 2008). https://www.acq.osd.mil/dsb/reports/2000s/ADA477619.pdf

In the event of a power outage, many DoD installations have only diesel generators and a limited supply of on-site diesel fuel. An extended grid failure could severely limit DoD's ability to carry out domestic and foreign operations.[98] Microreactors would be expected to operate 24 hours per day without disruption and do not require frequent refueling. DoD installations could therefore continue normal operations in the event of an extended commercial grid disruption.

DoD aims to deploy microreactors in 2027, or shortly thereafter. This timeline assumes that there are no major technical hurdles to overcome. In addition, there are environmental and reactor siting reviews to address. Should microreactors become viable on a commercial scale, large-scale adoption of microreactors will require significant amounts of HALEU. DoD currently can only supply its HALEU needs through DOE's downblending of highly-enriched uranium, the supply of which is limited.[99] Future deployment of micro-reactors for defense purposes will increase national defense requirements for uranium and emphasizes the need for a viable U.S. commercial uranium industry.

A healthy U.S. commercial uranium industry is essential for defense needs. As DoD does not anticipate requiring newly-mined uranium for some years, it is

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[98] Ibid.

[99] *Roadmap for the Deployment of Micro-Reactors for U.S. Department of Defense Domestic Installations."* Nuclear Energy Institute. October 4, 2018. https://www.nei.org/CorporateSite/media/filefolder/resources/reports-and-briefs/Road-map-micro-reactors-department-defense-201810.pdf

impractical to suggest that a privately-owned mine could afford to operate on standby awaiting future DoD purchases. DoD analysts have noted that it "can be difficult to reconstitute a material capability if all expertise and market share is lost," as most recently seen with U.S. rare earth mineral producers. U.S. uranium producers must be able to attract sufficient commercial (i.e. nuclear power generator) business in the present market to ensure their availability for defense requirements in the future.

Future Defense Needs: Proposed Nuclear Submarine Production

The Department of the Navy recently submitted its Fiscal Year 2020 President's Budget, recommending the construction of 55 new battle force ships over the next five years.[100] Fourteen of these are nuclear-powered: eleven *Virginia*-class submarines, two *Columbia*-class submarines, and one *Gerald R. Ford*-class aircraft carrier.

The *Virginia*-class and *Columbia*-class submarines both house reactors which contain enough fuel to last the life of the ship, roughly 33 and 40 years respectively, unlike previous models which required refueling and overhaul.[101] The

[100] *"Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020."* Office of the Chief of Naval Operations. March 2019. https://www.secnav.navy.mil/fmc/fmb/Documents/20pres/PB20%2030-year%20Shipbuilding%20Plan%20Final.pdf

[101] *S9G Nuclear Reactors*: http://www.world-nuclear.org/information-library/non-power-nuclear-applications/transport/nuclear-powered-ships.aspx

Ford-class aircraft carrier requires refueling, but at a significantly lower rate than the *Nimitz*-class aircraft carriers it will replace. DOE's current projection of HEU stockpile consumption for naval reactors does not take into account the addition of these 14 new nuclear-powered vessels. If these vessels are built, the total naval demand for HEU fuel will increase beyond what NNSA has anticipated, thus accelerating the date by which the HEU stockpile will be depleted.

The Role of National Security in Nuclear Regulation

Since Congress passed the Atomic Energy Act in 1946, all legislation governing the nation's uranium and nuclear power generation industries has been written with an emphasis on national security functions. As envisioned by Congress, regulation of the U.S. uranium and nuclear power generation industries is to be conducted in support of national security objectives. Consequently, Congress has empowered federal agencies to intervene in support of continued domestic U.S. uranium production capacity on several occasions. A brief history of this legislation can be found in Appendix H.

2. Uranium is Required for Critical Infrastructure

Uranium is also required to satisfy requirements associated with the 16 critical infrastructure sectors identified by the U.S. Government in the 2013

Presidential Policy Directive 21 (PPD-21)[102] (*see* Figure 25). Critical infrastructure, as defined by PPD-21, provides the "essential services that underpin American society" and "are vital to public confidence and the Nation's safety, prosperity, and well-being."[103]

Figure 25: Critical Infrastructure Sectors		
Chemical	Commercial Facilities	Communications
Critical Manufacturing	Dams	Defense Industrial Base
Emergency Services	Energy (Including Electric Power Grid)	Financial Services
Food and Agriculture	Government Facilities	Healthcare and Public Health
Information Technology	Nuclear Reactors, Materials, and Waste	Transportation Systems
Water and Wastewater Systems		
Source: PPD-21; Department of Homeland Security		

U.S. nuclear power generators are specifically included in the Nuclear Reactors, Materials, and Waste sector. Additionally, as U.S. nuclear power generators are integral to the nation's commercial electric grid, they are also part of the Energy sector. PPD-21 specifically notes that the Energy sector supports all other sectors because of its "enabling function."[104] Consequently, as all critical infrastructure sectors are dependent on reliable supplies of electricity, 19 percent of which is provided by the nation's 98 nuclear reactors. Thus, uranium is needed to support all U.S. critical infrastructure sectors.

[102] U.S. White House. Office of the Press Secretary. *Critical Infrastructure Security and Resilience.* Presidential Policy Directive 21. (Washington, DC: 2013) https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

[103] Ibid.

[104] Ibid.

Changing Electricity Generation Markets Affect U.S. Nuclear Generators

One of the primary challenges to the viability of the U.S. uranium industry is the closure of U.S. nuclear power plants. The front-end U.S. uranium industry relies on nuclear power plant operators for approximately 98 percent of its business. Consequently, the uranium industry cannot survive without a healthy U.S. nuclear power generation sector. Between January 2013 and September 2018, U.S. utilities retired seven reactors at six nuclear power facilities – a loss of more than 5,000 megawatts (MW) of generation capacity. Another 12 reactors with a combined generation capacity of 11.7 gigawatts (GW) are scheduled to close within the next seven years.[105]

A majority of the current nuclear fleet was constructed in the 1970s and 1980s when large-scale bulk power generators, including nuclear plants, were considered the most cost-effective means of providing reliable electricity. Although these plants required significant capital expenditures for construction, low fuel and operating costs made them practical to operate on a near-constant

[105] "America's oldest operating nuclear power plant to retire on Monday." U.S. Energy Information Administration. September 14, 2018. https://www.eia.gov/todayinenergy/detail.php?id=37055

basis.[106] Energy planners particularly recognized that large scale plants were well equipped to provide baseload generation capacity.[107]

However, lower-than-projected electrical consumption growth rates, combined with aggressive energy conservation efforts, prevented many utilities from operating the baseload nuclear power plants at optimal levels. Distorted electricity markets caused by current FERC-approved market rules and increased adoption of renewable energy resources, such as solar and wind, which are subsidized through Federal and state tax incentives, are resulting in increased cost sensitivity within the nuclear power industry and premature retirements of nuclear power generation units.[108]

[106] "Advancing Past "Baseload" to a Flexible Grid- How Grid Planners and Power Markets Are Better Defining System Needs to Achieve a Cost-Effective and Reliable Supply Mix," 1. The Brattle Group. June 26, 2017. http://files.brattle.com/system/publications/pdfs/000/005/456/original/advancing_past_baseload_to_a_flexible_grid.pdf?1498246224

[107] Roughly defined, baseload generation capacity refers to generation capacity that can provide "relatively low-cost electricity production to meet around-the-clock electricity loads". Ibid., 5.

[108] The Federal Energy Regulatory Commission (FERC or the Commission) has recognized that there are deficiencies in the way the regulated wholesale power markets price power ("price formation," i.e., energy, capacity, and ancillary services) and has developed an extensive record on price formation in the Commission-approved ISOs and RTOs.

[redacted] In this decreased demand environment, wind generators were able to compete through the Production Tax Credit (PTC) that allows them to produce at negative cost. Nuclear generators, in contrast, generally do not receive similar subsidies.

[redacted]

In addition to renewables, the introduction of highly efficient turbine gas generators and the wide availability of low cost natural gas, has changed the competitive landscape. Ten survey respondents indicated that their nuclear facilities faced significant challenges to their viability from natural gas-fired generators. Under current wholesale electricity pricing mechanisms, natural gas-fired generators are able to sell their electricity to the grid at lower costs than

nuclear operators. This is partially due to the intermittent nature of natural-gas fired generation; natural gas-fired generators can be activated and deactivated as needed, whereas nuclear power generators have less operational flexibility. Similarly, subsidized renewable sources, such as solar and wind, are intermittent operators (e.g. during daytime hours for solar, and favorable wind conditions for wind) and can be sold at a lower cost than constantly-running nuclear generators.

These factors create a situation that substantially disadvantages nuclear power generators. A 2017 IHS Markit study observed that, "generating resources providing security of supply receive negative market-clearing prices because distorted market conditions drive rival subsidized suppliers to bid against each other to avoid the loss of output-based subsidy payments."[109] FERC, recognizing challenges faced by nuclear and other baseload generators, opened a proceeding in January 2018 to examine the relationship between grid reliability and wholesale market rules.[110] The proceeding will examine grid resilience pricing and consider how valuation deficiencies lead to premature retirements of fuel-secure generation,

[109] *"Ensuring Resilient and Efficient Electricity Generation: The Value of the current diverse US power supply portfolio."* IHS Markit. April 2018. [hereinafter IHS Ensuring Resilient and Effective Electricity Generation]

[110] FERC acknowledges that that there are deficiencies in the way the regulated wholesale power markets price power ("price formation," i.e., energy, capacity, and ancillary services) and has developed an extensive record on price formation in the Commission-approved ISOs and RTOs. FERC "Grid Resilience in Regional Transmission Organizations and Independent System Operators," Docket No. AD18-7-000 (January 2018)

including nuclear. FERC, has not yet taken action to address the inequities of the markets that threaten the resilience of the Nation's electricity system.

Increased state energy efficiency standards and the predominance of the service sector in the economy, which does not consume as much energy as other sectors such as manufacturing, have slowed electricity demand growth. In 2017, the North American Electric Reliability Corporation (NERC) reported that the annual growth rate of peak demand reached record lows of 0.61 percent in summer and 0.59 percent in winter.[111] Slower growth in electricity demand places increased economic pressures on large-scale generators, including nuclear power plants.[112]

The increased presence of natural gas-fired and renewable power plants in the nation's electric generation grid does not obviate the need for nuclear power baseload generators. In fact, there is a continued role for nuclear power plants because they can provide a constant flow of electricity to the grid and do not require constant deliveries of fuel from external sources. Nuclear power plants can produce at near-full capacity when solar and wind generation facilities cannot produce electricity.

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[111] "Long Term Reliability Assessment," 12. North American Reliability Electric Reliability Corporation. December 2018. https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2018_12202018.pdf

[112] In 1990, the compound annual growth rate in demand for both summer and winter exceeded 2%. Ibid.

Similarly, natural gas plants are reliant on "just-in-time" deliveries of natural gas, and natural gas storage capacity in the U.S. is severely limited in many regions.[113] A North American Electric Reliability Corporation (NERC) report noted that only 27 percent of U.S. natural gas-fired generation capacity installed since 1997 is capable of dual fuel usage, which uses alternative fuel such as diesel to maintain generation.[114] Natural gas pipelines are also vulnerable to cyberattack, which can disable pipeline operations and cut off gas supply.[115]

In contrast, nuclear generators are not subject to similar potential disruptions or energy storage limitations since they have long refueling cycles between 18 and 24 months, and do not require constant fuel deliveries. These refueling operations are planned well in advance, allowing both plant and transmission system operators to make arrangements for alternative generation capacity. All survey respondents indicated that they could maintain normal generation operations even with a missed delivery of uranium concentrate, uranium hexafluoride, or enriched uranium. Respondents indicated that they maintain sufficient inventory of the

[113] "Special Reliability Assessment: Potential Bulk Power System Impacts Due to Severe Disruptions on the Natural Gas System," 10. North American Electric Reliability Corporation. November 2017. https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SPOD_11142017_Final.pdf

[114] Ibid.

[115] Blake Sobczak, Hannah Northey, and Peter Behr, "Cyber raises threat against America's energy backbone", *E&E News* (May 23, 2017), https://www.eenews.net/stories/1060054924/

above products and have layered contracts with multiple suppliers. Any single missed delivery could therefore be addressed with existing inventory.

Respondents identified missed deliveries of fabricated fuel prior to a scheduled refueling as the greatest threat to continue operation. [redacted]

Based on the nature of the nuclear supply chain, nuclear power generators are comparatively more resilient than other power generation sources that require constant fuel deliveries. As presented in Chapter VII, U.S. nuclear power generators can use U.S.-sourced uranium to meet their power needs, potentially avoiding situations where U.S. utilities would be reliant on last-minute imports of natural gas or other materials to address shortfalls.[116] Leveraging the unique

[116] During extreme cold temperatures in January 2018, Distrigas of Massachusetts had to import liquefied natural gas from Russia to address a gas shortage in the region.

Chesto, Jon. "Russian LNG Is Unloaded in Everett; the Supplier (but Not Gas) Faces US Sanctions." *Boston Globe*, January 30, 2018. https://www.bostonglobe.com/business/2018/01/29/tanker-unloads-lng-everett-terminal-that-contains-russian-gas/rewj1wKjajaKtLp79irzTI/story.html.

operational characteristics of nuclear power generators and the unused capacity of the U.S. uranium industry can ensure greater grid reliability.

B. Imports of Uranium in Such Quantities as are Presently Found Adversely Impact the Economic Welfare of the U.S. Uranium Industry

1. U.S. Utilities' Reliance on Imports of Uranium in 1989

In September 1989, the Secretary completed a Section 232 investigation on the effect of uranium imports on the national security. The investigation, requested by the Secretary of Energy, determined that U.S. utilities imported a significant share of their uranium requirements. At the time, imports of uranium concentrate accounted for roughly 51 percent of domestic utility demand.[117] The 1989 investigation also found that U.S. uranium producers faced strong foreign competition, particularly from the Soviet Union. It further reported that employment in the industry was steadily decreasing.[118]

[redacted][119]

[117] 1989 Report, I-2

[118] *Id.* III-10 and III-27

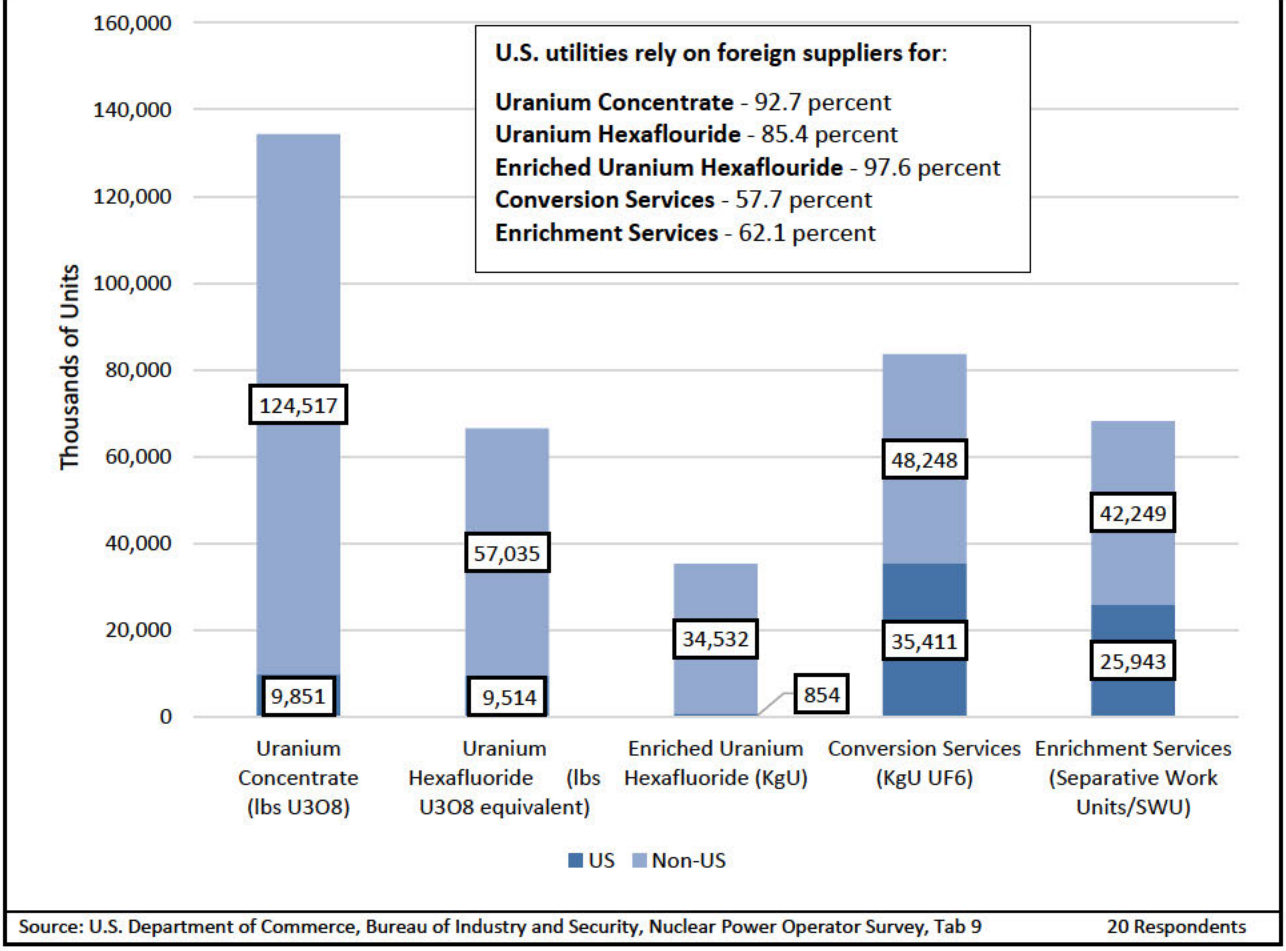
[119] Ibid., V-4 to V-5.

Consequently, the Secretary concluded that uranium was not being imported into the United States under such quantities or circumstances that threatened to impair the national security. For more discussion of the 1989 Section 232 investigation, refer to Appendix G.

2. U.S. Utilities' Reliance on Imports of Uranium Continue to Rise

U.S. utilities' reliance on foreign suppliers to meet their uranium product and service requirements have continued to increase since the 1989 uranium 232 investigation. In 2018, U.S. nuclear utility operators relied on foreign suppliers for 93.3 percent of their uranium concentrate requirements, 85.5 percent of their uranium hexafluoride requirements, and 97.6 percent of their enriched uranium hexafluoride (UF6) requirements. As for uranium service requirements, U.S. nuclear utility operators relied on foreign suppliers for 42.3 percent of their conversion service requirements and 61.5 percent of their enrichment service requirements from 2014 to 2018 (*see* Figure 27).

Figure 27: Aggregated U.S. Utility Consumption of Uranium Products, 2014-2018



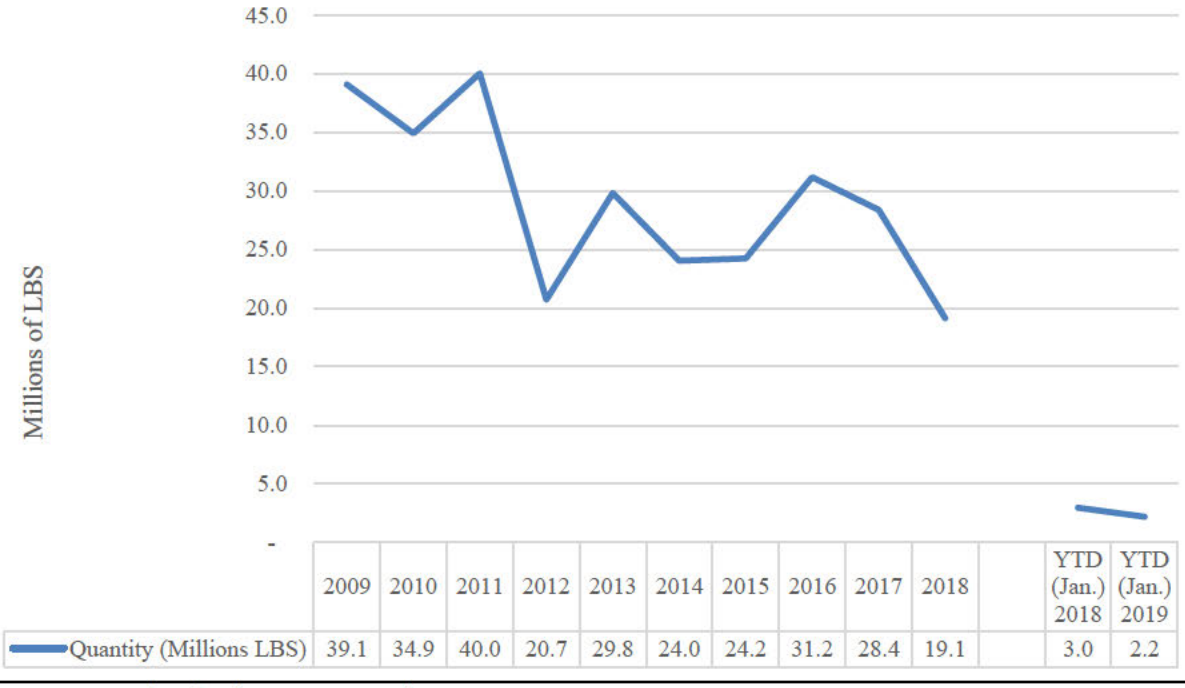
Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Operator Survey, Tab 9 — 20 Respondents

In 2018, U.S. imports of uranium products reached a 10-year low in terms of both total quantity and aggregate value. Imports peaked in both terms in 2011, when 40 million pounds of uranium products were imported, at a total value of $5.3 billion USD.[120] However, the Fukushima incident occurred in the same year, and both figures have since declined, reaching a total of just over 19 million

[120] USITC Dataweb

pounds in 2018 (a 52 percent decrease), for a combined value of $2.2 billion USD (a 58 percent decrease)[121] (*see* Figures 28 and 29).

Figure 28: U.S. Imports of Uranium Products

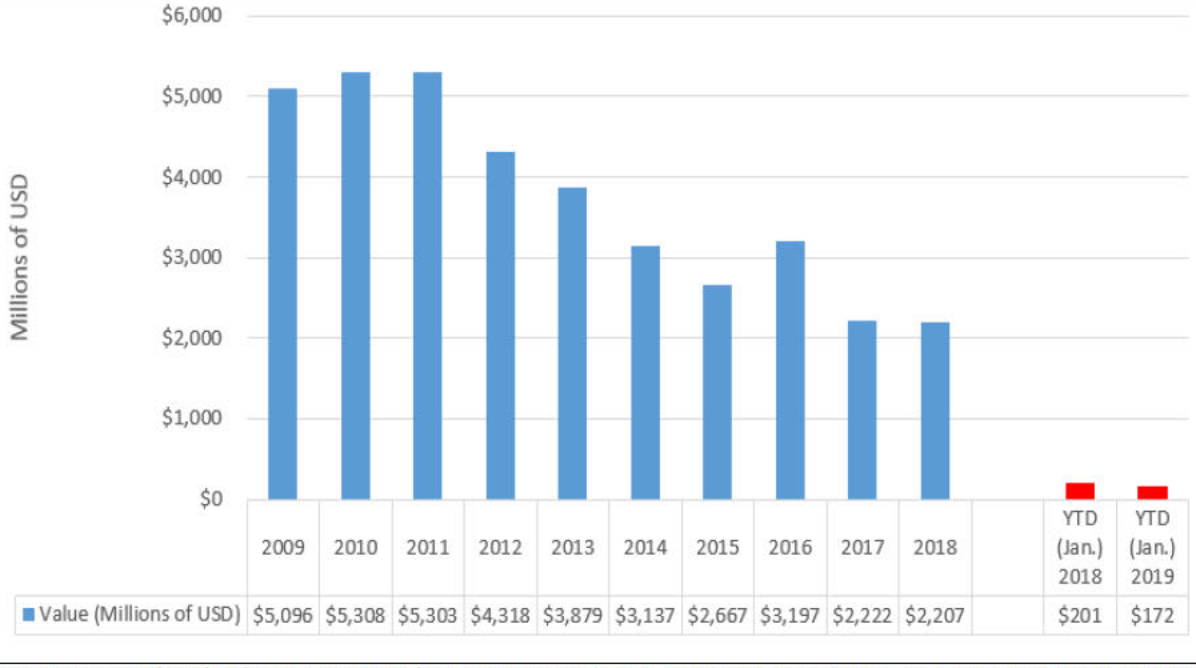


	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (Millions LBS)	39.1	34.9	40.0	20.7	29.8	24.0	24.2	31.2	28.4	19.1		3.0	2.2

Source: USITC Dataweb Updated 3.18.2019, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20, 2844.30.50

[121] USITC Dataweb

Figure 29: Value of U.S. Imports of Uranium Products



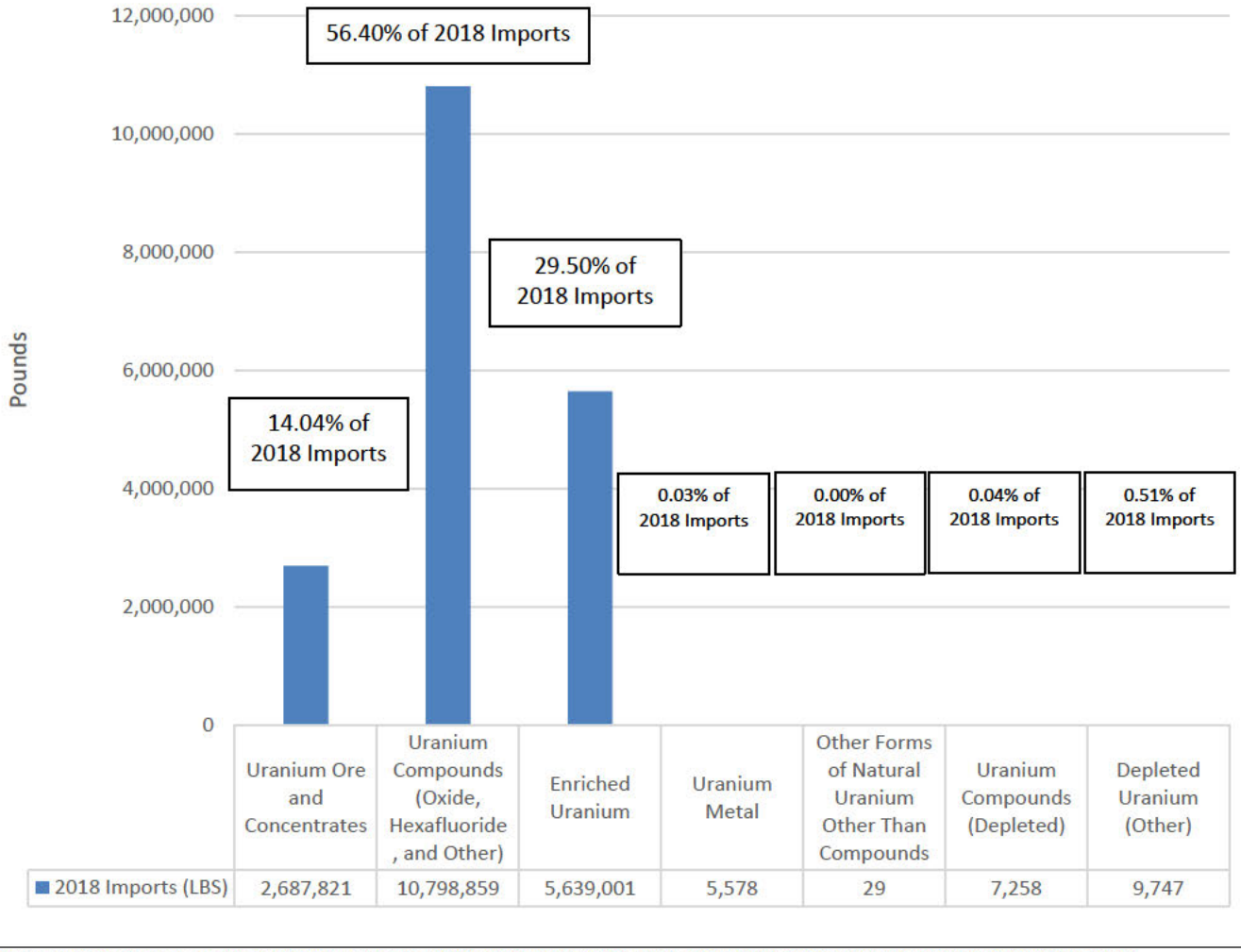
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		YTD (Jan.) 2018	YTD (Jan.) 2019
Value (Millions of USD)	$5,096	$5,308	$5,303	$4,318	$3,879	$3,137	$2,667	$3,197	$2,222	$2,207		$201	$172

Source: USITC Dataweb Updated 3.18.2019, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20, 2844.30.50

The HTS codes that represent uranium products are broken out by materials that represent the different stages of the fuel cycle that uranium ore goes through to become a nuclear fuel assembly. The total composition of 2018 imports of uranium products was comprised of a little over half (56.4 percent) of uranium compounds (oxide, hexafluoride, and other) and about one-third (29.5 percent) of enriched uranium (*see* Figure 30). Fuel assemblies are not listed in Figure 30 due to the fact that from 2014 to 2018, no fuel assemblies imported into the U.S. were for actual use by U.S. nuclear electric power operators. During this time period

imported fuel assemblies where either test assemblies or products that were being returned to the original manufacture.[122]

Figure 30: U.S. Imports of Uranium Products, 2018



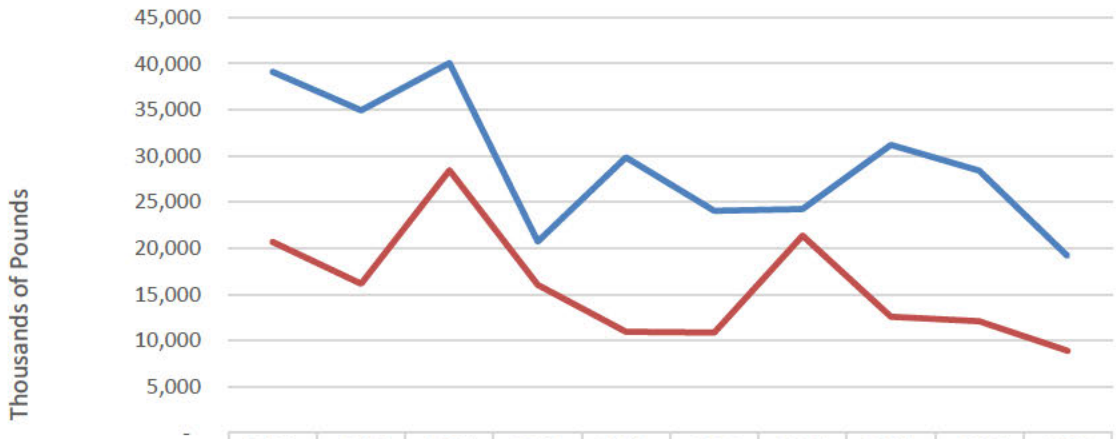
Source: USITC Dataweb Updated 3.28.19, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20, 2844.30.50

[122] Department of Energy, Nuclear Security Administration, Nuclear Materials Management and Safeguard System.

3. High Import to Export Ratio

U.S. imports of uranium products, which displace demand for domestic uranium and lower production at U.S. mines, reached 2.7 times the level of exports of U.S. uranium products in 2013 (*see* Figure 31). In 2018, U.S. import levels were 2.2 times the level of exports of U.S. uranium products. Uranium production from state owned enterprises continues to depress world uranium spot prices, making it increasingly difficult for U.S. companies to export their uranium products. In 2018, 98 percent of U.S. uranium exports were made up of "uranium compounds, uranium metal, and other forms of natural uranium," 1.8 percent was "enriched uranium", and 0.2 percent was "depleted uranium" (*see* Figure 32).

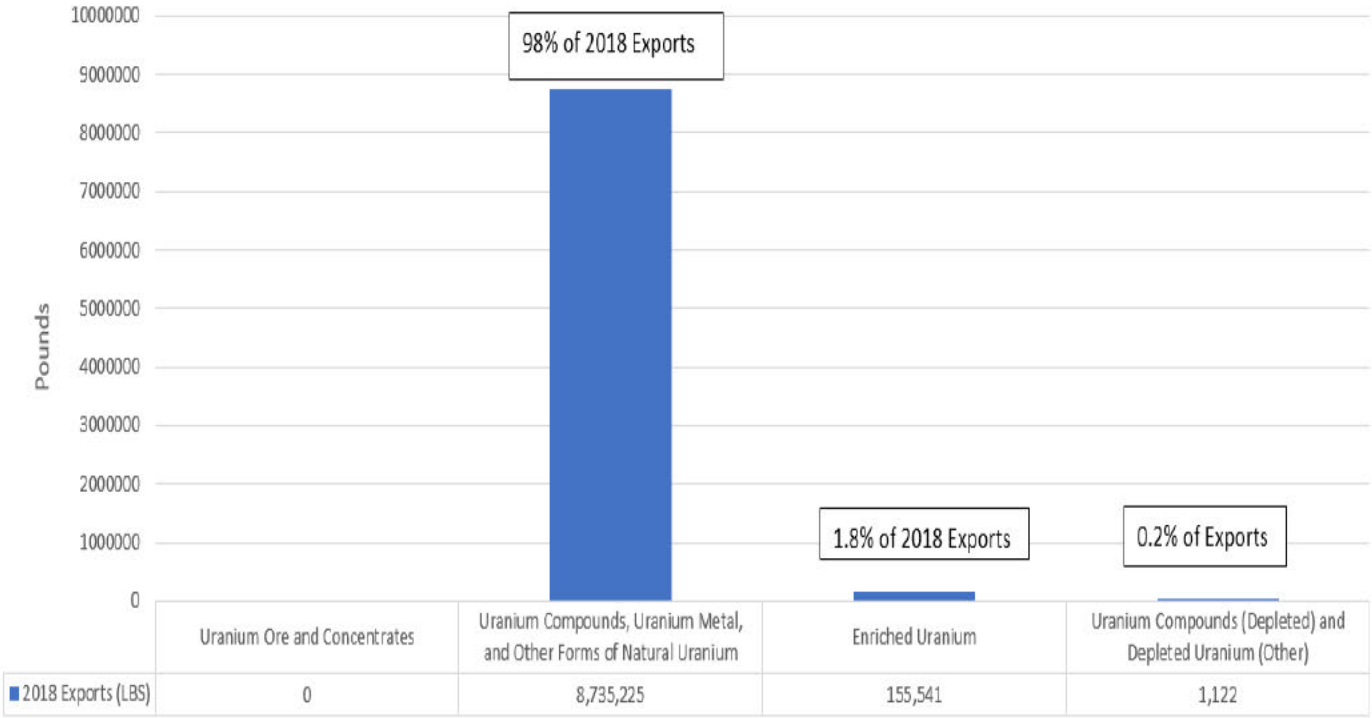
Figure 31: U.S. Imports and Exports of Uranium Products



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Imports (Thousands of LBS)	39,074	34,910	40,030	20,710	29,818	24,044	24,231	31,171	28,390	19,148
Exports (Thousands of LBS)	20,659	16,134	28,423	16,025	10,956	10,858	21,348	12,580	12,098	8,892

Source: Global Trade Atlas Updated 4.12.2019, HTS Codes: 2612.10, 2844.10, 2844.20, 2844.30.20, and 2844.30.50

Figure 32: U.S. Exports of Uranium Products, 2018



Source: USITC Dataweb Updated 3.28.19, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20

4. Uranium Prices

The Department's 1989 uranium 232 investigation identified several trends responsible for the decline in global uranium prices, including increased production from lower-cost ore bodies in Canada, Australia, and South Africa; dumping of Russian, Kazakh, and Uzbek material on the global enriched uranium market; and cancellations of proposed reactors in the U.S. and other Western nations.[123]

[123] 1989 Report. III-12 to III-14 and III-26 to III-27

Many of these trends persisted well after 1989, and following the dissolution of the Soviet Union, uranium sales from Russia, Kazakhstan, and Uzbekistan continued to influence both the U.S. and global uranium markets. As detailed in the end of this section, the U.S. Government addressed the impact of these sales of subsidized uranium through anti-dumping investigations and the imposition of suspension agreements.

At the same time, other imports from the former Soviet Union continued to depress uranium prices. Under the 1993 Megatons to Megawatts program[124] (officially the "Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Disposition of Highly Enriched Uranium Purchase Agreement"), the U.S. and Russian governments agreed to the conversion of 500 metric tons of HEU from dismantled ex-Soviet nuclear weapons into LEU, which was ultimately sold to U.S. utilities. Between 1993 and 2013, this program resulted in the introduction of 14,000 metric tons of LEU into the U.S. nuclear fuel market, directly competing with U.S. uranium production.

Demand in the United States for nuclear power also stagnated after 1989. The Tennessee Valley Authority's Watts Bar 1, which came online in 1996, was the

[124] "Megatons to Megawatts program will conclude at the end of 2013." U.S. Energy Information Administration. (Washington, DC: 2013). https://www.eia.gov/todayinenergy/detail.php?id=13091

only nuclear reactor completed in the United States between 1989 and 2016. Between 1989 and 2000, nine reactors were decommissioned and no new reactors were authorized. Lack of domestic demand, spurred in part by competition from other generation sources and public opposition to new nuclear power projects after the Three Mile Island and Chernobyl incidents, were factors that contributed to low uranium prices during this period. By November 2000, uranium spot market prices had fallen to $7.13 per pound; a 56 percent decrease from the July 1996 high of $16.50 and a 39 percent decrease from the January 1989 price of $11.60.

Uranium prices then began to climb beginning in fall 2001, and by November 2001, the spot price reached $9.43. The price then climbed exponentially thereafter, reaching $13.18 in November 2003, $33.55 in November 2005, and a record $136.22 in June 2007 – a 1,810 percent increase on the November 2000 price. The principal driver of this price increase was a trend widely referred to as the "nuclear renaissance," which anticipated the construction of dozens of reactors worldwide.

Influenced, in part, by increasing oil and natural gas prices, as well as, public concern about carbon emissions, many Western governments adopted policies intended to promote the construction of new nuclear power generators. In the United States, the Energy Policy Act of 2005 provided financial incentives for the construction of new nuclear plants, including a production tax credit and

guarantees for construction loans.[125] U.S. utilities took advantage of these policy changes and applied for construction and operating licenses for 25 new reactors between 2007 and 2009.[126]

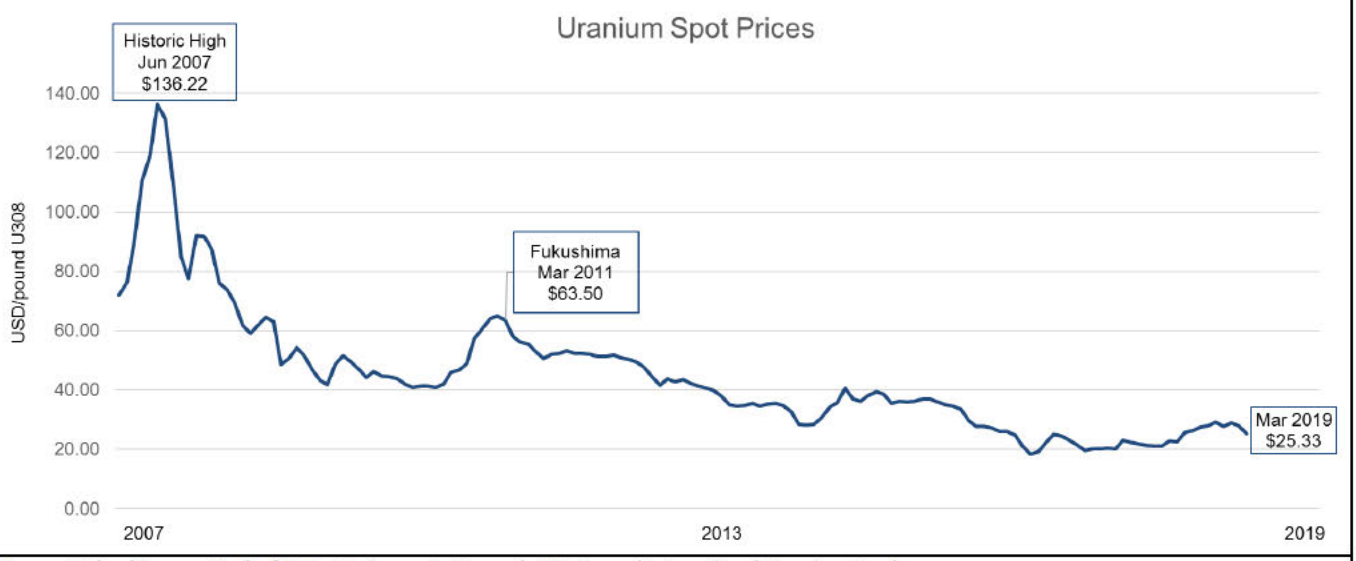
Most of these reactors, however, were not built. As discussed earlier, the March 2011 Fukushima incident prompted a groundswell of public opposition to new nuclear power generation. Additionally, competition from low-cost gas fired turbine generators made plans for many nuclear plants economically unfeasible. Of the 25 reactor applications submitted between 2007 and 2009, only three will be completed by 2022. The remaining reactor plans were cancelled due to a variety of factors, including public reaction to the Fukushima incident and falling electricity prices.

The Fukushima incident and subsequent cancellation of proposed new reactors created a global uranium oversupply. The uranium spot market price fell from $63.50 in March 2011 to $42.28 by March 2013. By March 2017, the price had fallen to $24.55 – a 61 percent decline from the March 2011 price (*see* Figure 33).

[125] "Nuclear Power in the USA." World Nuclear Association. http://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx

[126] Rascoe, Ayesha. "U.S. Approves First New Nuclear Plant in a Generation." *Reuters*, February 9, 2012. https://www.reuters.com/article/us-usa-nuclear-nrc/u-s-approves-first-new-nuclear-plant-in-a-generation-idUSTRE8182J720120209

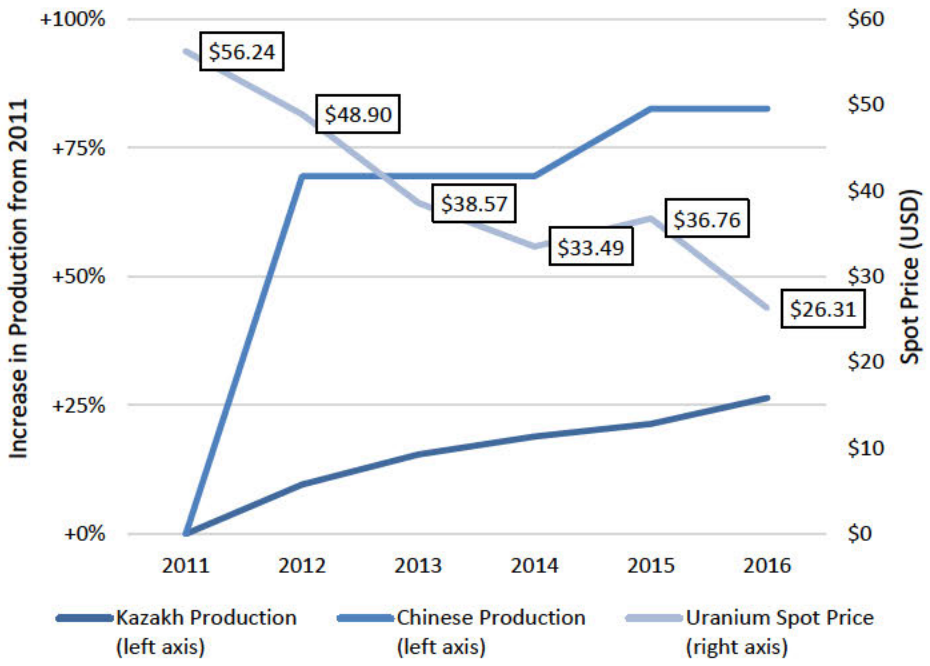
Figure 33: Spot Market Price of Uranium, 2007 – Present



Source: Federal Reserve Bank of St. Louis, Economic Research Division and International Monetary Fund

In the years following the Fukushima incident, U.S. uranium producers closed or idled 22 facilities, including mining, milling, conversion, enrichment, fuel fabrication, and R&D operations. As U.S. uranium producers ceased production due to poor market conditions, state-owned uranium enterprises increased output. According to available data, Kazakh and Chinese output had strong increases during the 2011 to 2016 period, even when global spot market prices were decreasing post-Fukushima incident (*see* Figure 34).

Figure 34: Foreign Production and Uranium Spot Market Price, 2011 - 2016



Source: World Nuclear Association; Federal Reserve Bank of St. Louis

Between 2011 and 2016, Kazakhstan's uranium production increased by 26 percent.[127] Similarly, China increased domestic uranium production by 83 percent during the same period.[128] These increases in production during a 61 percent decline in global uranium spot market prices further increased imports into the U.S., and highlights the ability of state-owned uranium enterprises to distort markets and disadvantage U.S. producers.

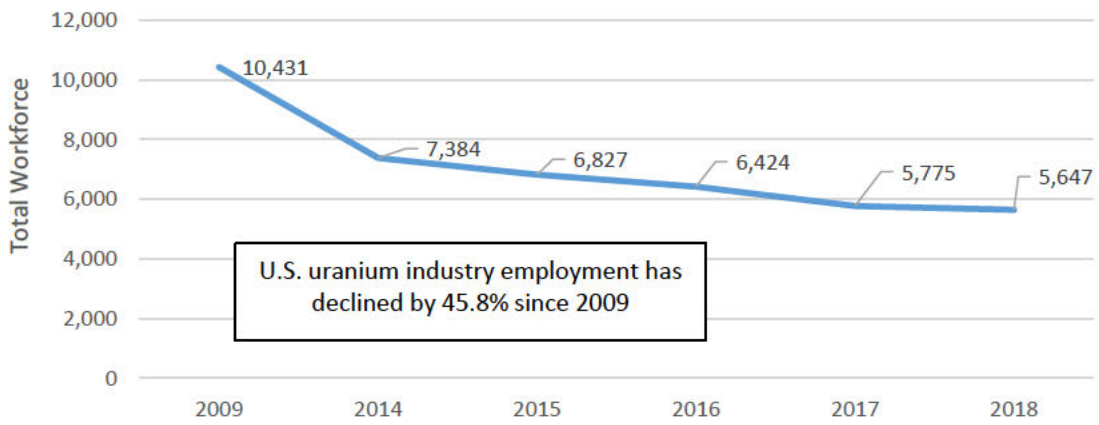
[127] "Uranium and Nuclear Power in Kazakhstan." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/kazakhstan.aspx

[128] "Uranium Production Figures, 2008-2017." World Nuclear Association. http://www.world-nuclear.org/information-library/facts-and-figures/uranium-production-figures.aspx

5. Declining Employment Trends

Employment in the U.S. front-end uranium industry has experienced steady declines over the surveyed years of 2014 to 2018. Data regarding employment in 2009 was collected in order to observe the levels of employment pre-Fukushima and post-Fukushima. As anticipated, between 2009 and 2018, miners, millers, converters, and enrichers experienced drastic decreases in workforce numbers. Overall employment in the front-end uranium industry declined by 45.8 percent over this period (*see* Figure 35).

Figure 35: U.S. Uranium Industry Employment, Front-End, 2009 and 2014-2018



NOTE: 2009 included to show realistic levels of employment pre-Fukushima; Includes miners, millers, converters, enrichers, and fuel fabricators.

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 10 32 respondents

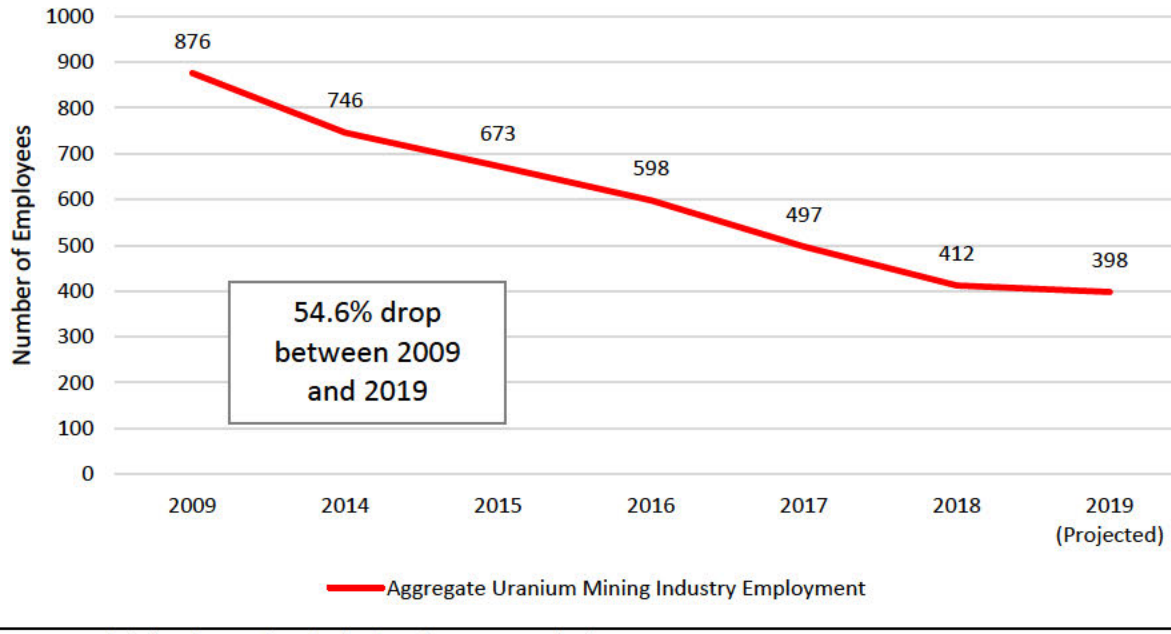
U.S. Front-End Uranium Industry Employment

For uranium miners, the decline in employment has been evident since the 1989 uranium 232 investigation. Indeed, the peak of uranium mining employment was 21,951 workers in 1979, but by 1989, employment had fallen 91 percent to just 2,002 workers.[129] Survey data shows that employment has further decreased since the 1989 uranium 232 investigation and steadily declined by 54.6 percent between 2009 and 2018, with further declines projected for 2019 (*see* Figure 36).

Events in the nuclear electric utility sector over the past 40 years have adversely affected uranium mining industry employment levels. Notably, the 1979 Three Mile Island accident and the 2011 Fukushima incident prompted significant downturns in the industry and caused steep declines in mining employment.

[129] 1989 Report. III-10

Figure 36: U.S. Uranium Miners and Millers, Industry Employment



NOTE: 2009 included to show realistic levels of employment pre-Fukushima

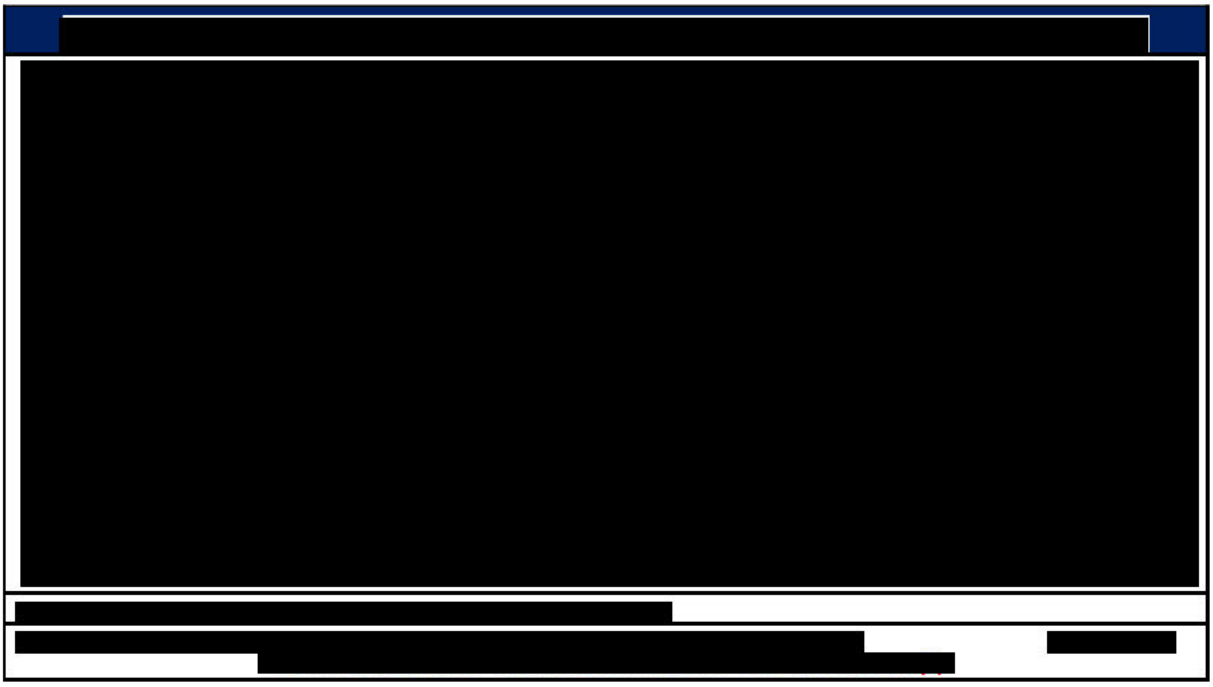
Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 10 20 Respondents

Mining employment is also affected by spot market prices. High spot market prices correspond with higher employment, while lower prices cause mines to idle and increased unemployment. The combined repercussions of the Fukushima incident and low spot market prices can be seen in the U.S. front-end uranium industry, as companies continue to cut workforce numbers and idle production.

[redacted]

[redacted]

[redacted]



[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

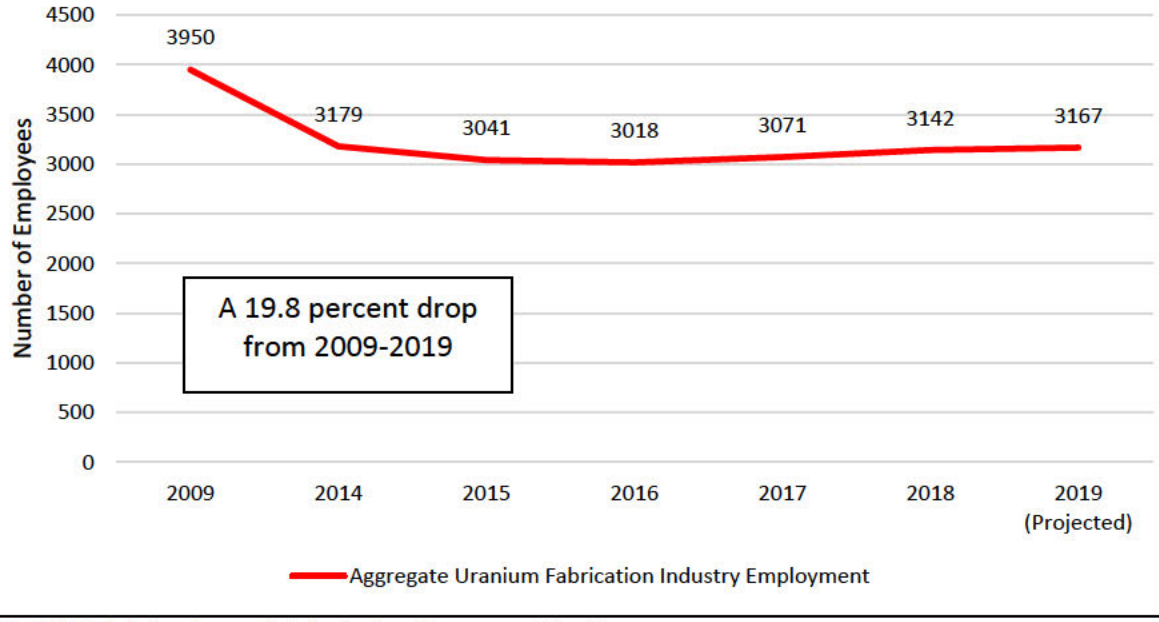
[redacted]

[redacted]

Fuel fabricators have seen a 19.8 percent decrease in workforce numbers since 2009. This moderate decrease is expected, as the vast majority of fabrication of fuel assemblies is still produced domestically due to the highly engineered nature of the final products. Decreases in domestic demand and poor market

conditions have affected domestic fuel fabricators, and workforce cuts were made in response to financial difficulties and reported bankruptcies (*see* Figure 39).

Figure 39: U.S. Uranium Fabricators, Industry Employment



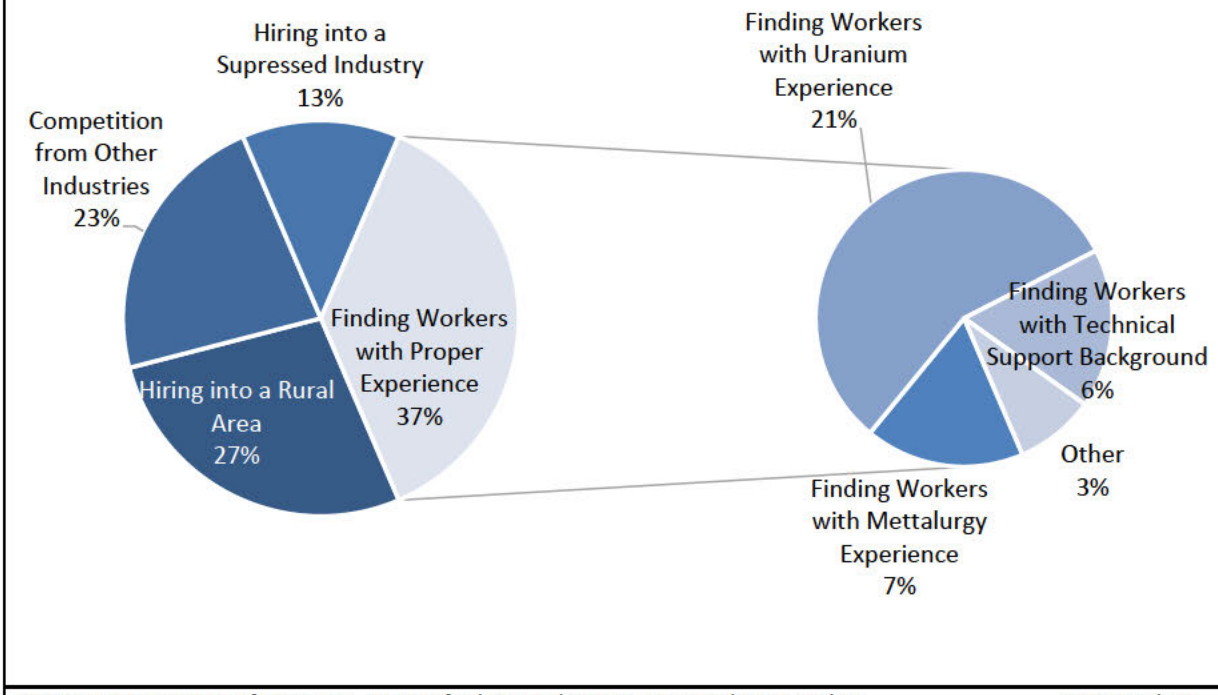
NOTE: 2009 included to show realistic levels of employment pre-Fukushima

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 10 — 4 Respondents

The substantial decreases observed in the front-end domestic uranium industry can have adverse effects on competitiveness and long-term production in the industry. The entirety of the front-end uranium industry requires a specialized workforce which consists of a wide range of expertise and education levels. Some skillsets within the industry are transferable to other applications. However, an aging workforce can mean the loss of knowledge and skillsets specific to the uranium industry as workers continue to transfer industries and retire. According to the Department's 2019 survey data, the average age of specialized workers in

the front-end industry is roughly 50 years old. Should workforce numbers continue to decrease, specialized workers will become increasingly difficult to hire or re-hire in the event of a market upswing due to both retirement and competition from other industries. Department survey data indicates various difficulties in hiring and retaining workers in the front-end uranium industry (*see* Figure 40).

Figure 40: Difficulties Hiring and Retaining Workers in the Uranium Industry



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 10 — 32 Respondents

Front-end uranium companies may be able to fill vacancies should production resume or increase, but difficulties in obtaining skilled employees will take time and investment. A lack of available skilled employees will require training new hires, thus adding additional costs. [redacted]

[redacted]

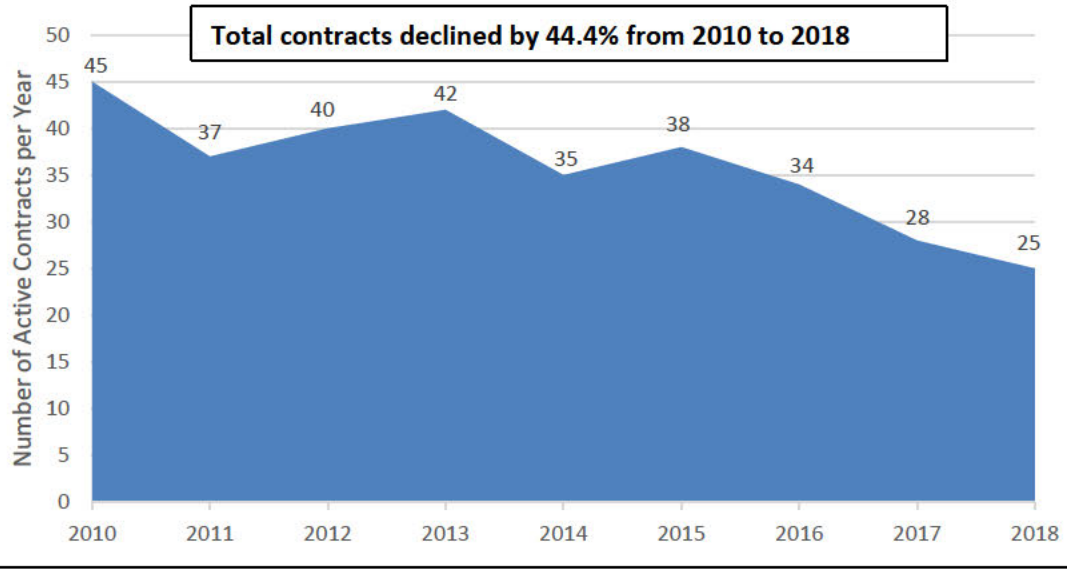
Efforts to recruit personnel are also complicated by the remote location of many uranium mines. Over half of the mining/milling respondents indicated that their facilities' rural location imposed a significant barrier to recruitment and retention. [redacted]

In the event of a major production increase, current employment levels and the trending decline in employment in all industries associated with the front-end uranium industry indicate that production needs would not be met by the current workforce, and significant additional hiring would be required (*see* Figure 41).

6. Loss of Domestic Long Term Contracts Due to Imported Uranium

Front-end uranium industry companies in the U.S. have experienced a decline in new or renewed contracts over the last decade. From 2010 to 2018, the number of active contracts for domestic front-end uranium industry companies, including miners, millers, converters, enrichers, and fuel fabricators, declined by 46.7 percent (*see* Figure 42).

Figure 42: Number of Active Front-End Contracts 2008-2018



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 9a

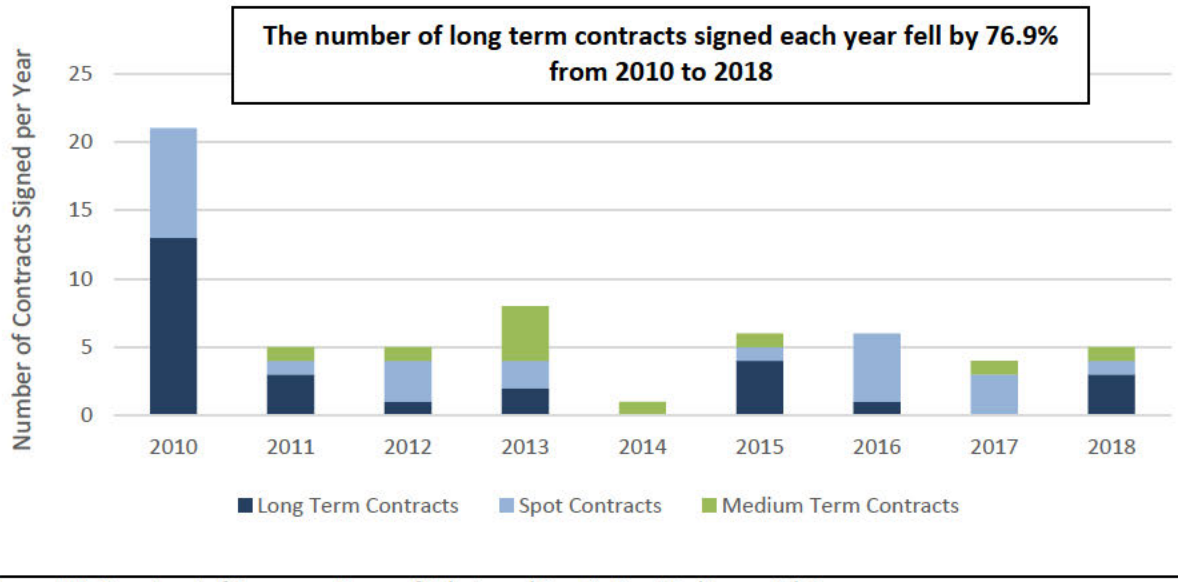
12 Respondents

These expiring contracts are not being offset by new contracts. From 2010 to 2018, the total number of new contracts extended to front-end companies fell by 76.2 percent. [redacted]

[redacted] This is evident by the decline in newly formed long-term contracts. Long-term contracts have fallen by 92.3 percent since 2010 and only one contract was signed in 2018.

In particular, long-term contracts for U.S. miners and millers fell by 71.4 percent, with just two active long-term contracts in 2018 (*see* Figure 43). The number of contracts that front-end companies retain is likely to fall further, as long-term contracts from previous years are set to expire. [redacted]

Figure 43: Types of Contracts – Millers and Miners, 2008-2018



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 9a

12 Respondents

7. Financial Distress

The 1989 uranium 232 investigation found that the front-end uranium industry was not financially viable during the period of the investigation. [131] Since these findings, increasing volumes of imported uranium have further crippled the financial health of the domestic front-end uranium industry. Uranium miners, converters, and enrichers have all felt the detrimental effects of decreasing market shares due to drastically increasing levels of imports. According to survey data, key points in the front-end uranium industry experienced increasing debt ratios and critically low profit margins during the 2014 to 2018 period. An assessment of financial risk for all surveyed uranium miners, converters, enrichers, and fuel fabricators is shown in Figures 44a and 44b.[132]

[131] 1989 Report. I-2

[132] Financial risk is evaluated based on survey data including balance sheets and income statements. Many of the companies classified as Low/Neutral Risk provided no information or do not incur many costs due to being idled, shutdown or having undeveloped deposits. Low/Neutral Risk is not necessarily an indication that they are not financially struggling but indicates in the near term they are unlikely to go out of business.

[redacted]

Uranium Miners

The financial health of uranium mining companies has deteriorated to even more unsustainable levels than at the time of the 1989 uranium 232 investigation.[133] As a result of the consolidation and homogenization of the industry in the past 30 years, financial struggles during market downturns have been magnified. U.S. uranium mining companies continue to struggle to compete in a market with low spot market prices that do not cover production costs, increasing imports from SOEs, and static/declining domestic demand. Should current market conditions continue, U.S. uranium miners will not be able to sustain operations for much longer.

The 1989 Uranium 232 Investigation found that a, "characteristic of the uranium mining industry is that few companies are exclusively dependent on the

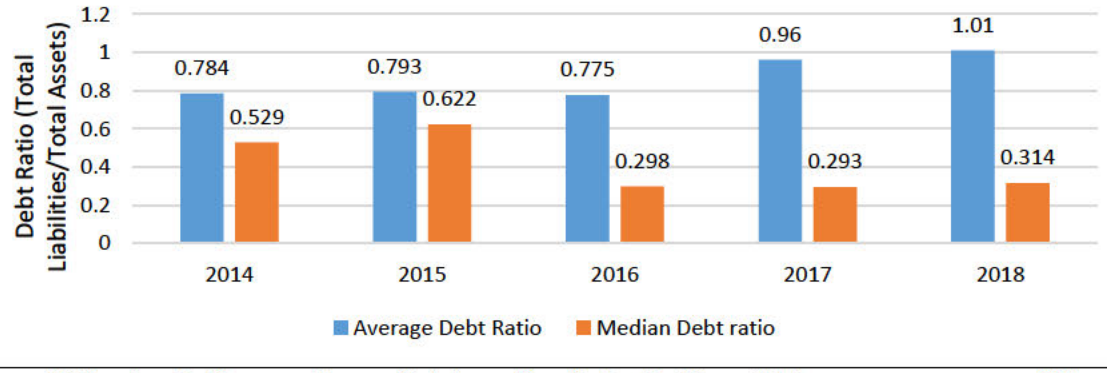
[133] 1989 Report III-1 to III-2

production and sale of the ore. Uranium production is usually a relatively small part or byproduct of other major activities of the firm."[134] This is a material difference between the state of uranium mining during the 1989 uranium 232 investigation and the uranium mining industry today. According to Department survey data, a majority of the 20 companies in today's domestic uranium mining industry depend exclusively on uranium mining for financial viability, and do not have the support of diverse business lines that would offset losses in their uranium mining activities.

The trend in industry debt ratios for the 2014 to 2018 period is worsening (*see* Figure 45). The increasing average and stable median for approximately half of the companies surveyed implies poor performance in managing debt. [redacted] The increase in debt ratios one observes can reasonably be attributed to companies actively engaged in unprofitable uranium mining operations.

[134] 1989 Report. III-2

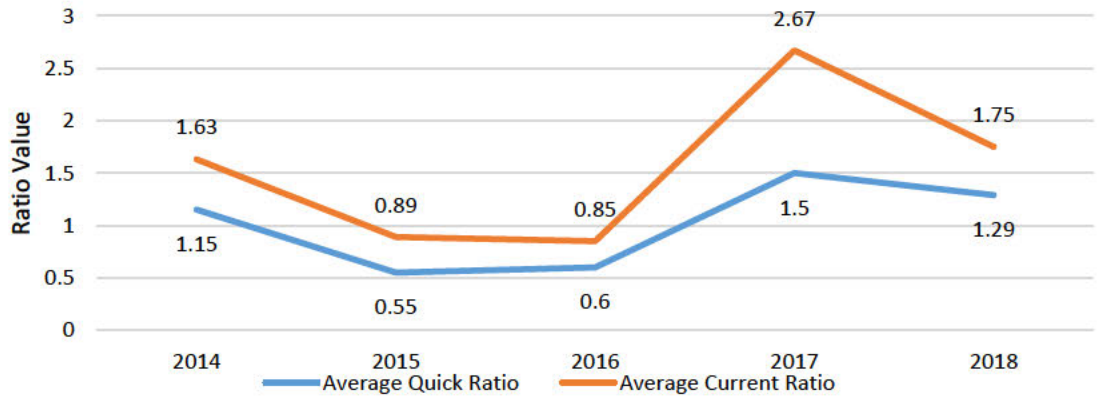
Figure 45: U.S. Miners Debt Ratio



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 5 20 Respondents

Average quick ratios and average current ratios indicate whether, on average, companies are able to cover near term liabilities in the short term. Values greater than one indicate that a company's assets can cover their near term liabilities, but it does not ensure that a company is able to cover long term liabilities with assets (*see* Figure 46).

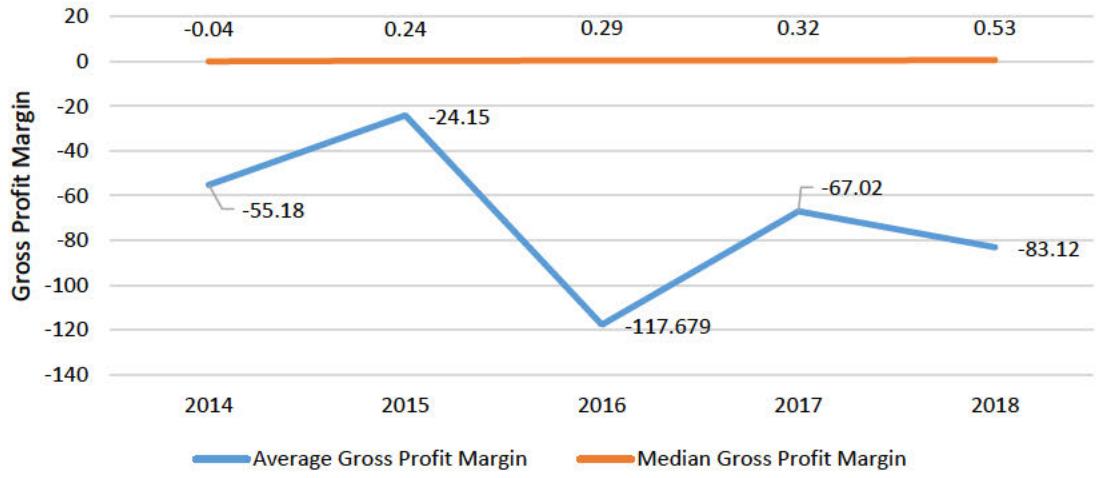
Figure 46: U.S. Mining Companies Quick and Current Ratios



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 5 19 Respondents

Uranium miners have also suffered from low profit margins (*see* Figure 47) and persistently negative net income (*see* Figure 48). The average gross profit margin for the surveyed companies is strongly negative and when paired with the average net income it shows that miners are losing money on operations at an alarming rate.

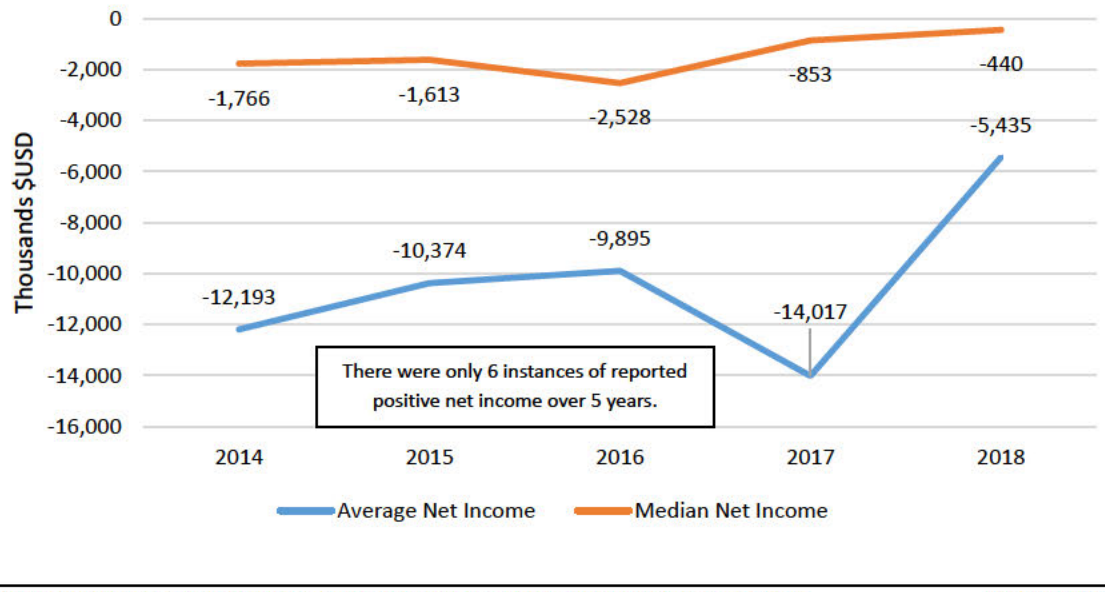
Figure 47: U.S. Miners Gross Profit Margins



NOTE: 11 out of 20 respondents had no net sales at all from 2014-2018 and by 2018 only 7 companies reported any net sales

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 5 20 Respondents

Figure 48: U.S. Miners Net Income



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 5 — 20 Respondents

Both gross profit margin and net income should be interpreted in the context of the few actively operating companies currently suffering the largest losses. Many of the idled companies reported negative net income due to the cost of maintaining permits and machinery. [redacted][135] This is in fact the case with other miners as well. In order to fulfill contracts, miners have purchased

[135] [redacted]

off the spot market to mitigate the financial losses from producing themselves or fulfilling contracts with their inventories. [redacted][136] To this end financial statements do not fully capture the cost cutting implementations being made to remain solvent.

Without a decrease in imports and an increase in prices and demand, mining operations will continue to have surmounting financial struggles. If current market conditions continue to exist, mining companies will begin to exit the market and this vital component of the fuel cycle will be lost.

Uranium Converters

There is only one location in the U.S that has conversion services. This is an integral point in the fuel cycle, yet it is not immune to financial struggles faced by the miners. [redacted]

[136] [redacted]

[redacted]

[redacted]

[redacted]

Uranium Enrichers

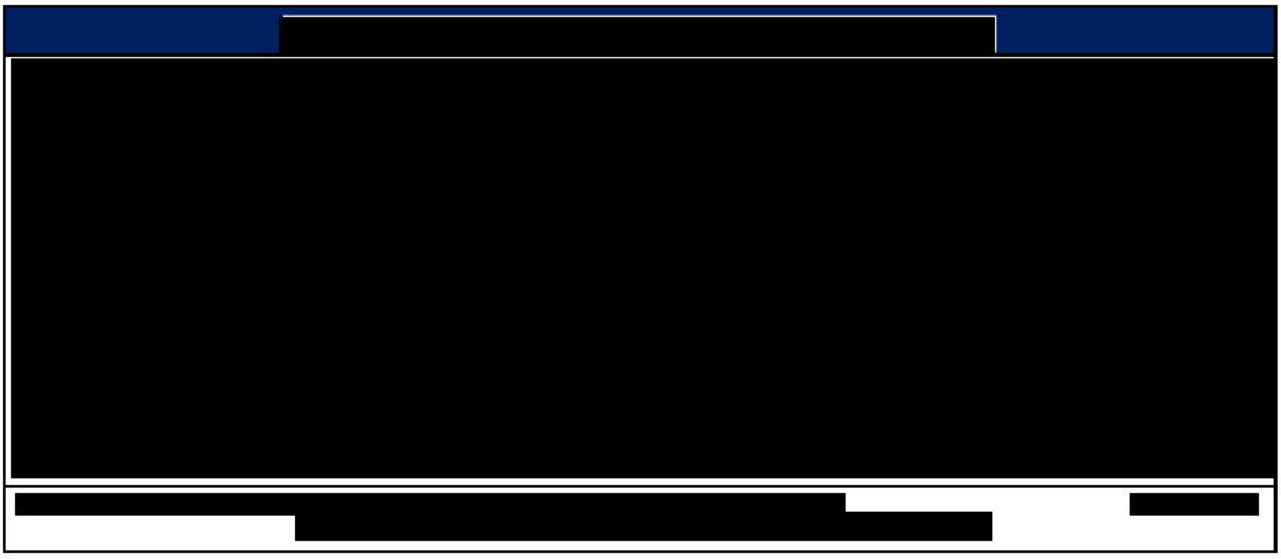
Urenco USA and Centrus Energy are the only uranium enrichers in the U.S., though only Urenco currently operates in that capacity.

[redacted][138]

[redacted]

[redacted]

[redacted



Enrichment is a key part of the nuclear fuel cycle and these two companies represent the entire U.S. capability to commercially enrich nuclear material. Retaining their vital capabilities is necessary to preserve the domestic fuel cycle, as their financial struggles are driven by the current state of the market.

Fuel Fabricators

The fuel fabricators are largely unaffected by financial struggles in other sectors of the industry. Debt ratios show that most cover the majority of their liabilities (*see* Figure 53).

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] Over the longer term, the fuel fabricators are concerned that Russia and Chinese SOEs

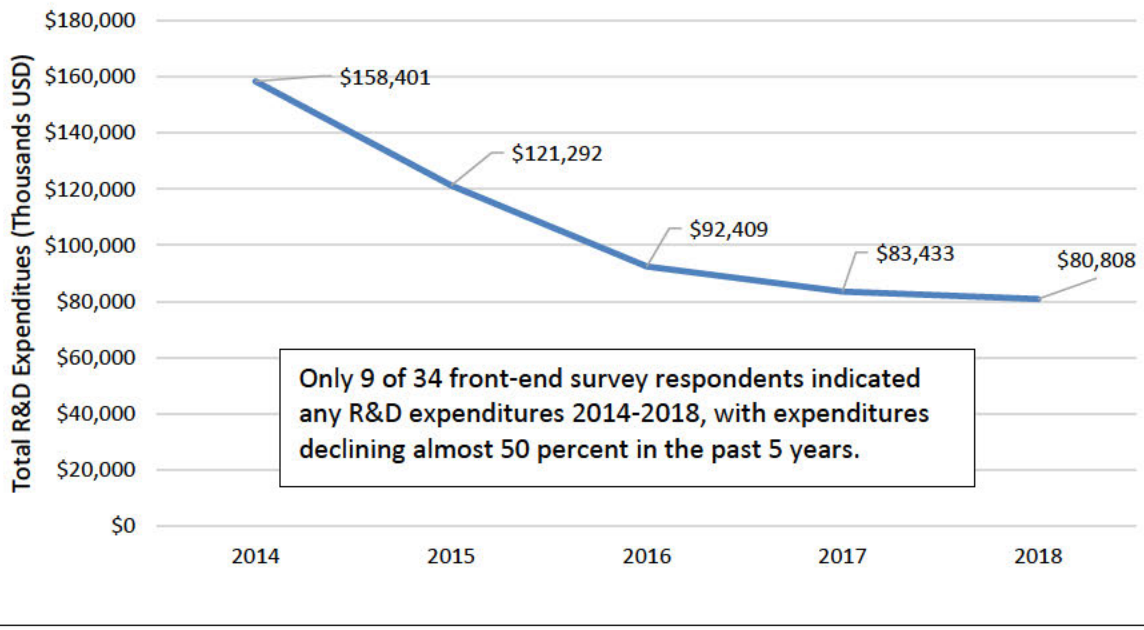
will sell fabricated fuel directly to the nuclear electric power operators, bypassing the need for U.S. domestic fuel fabricators.

8. Research and Development Expenditures

Research and development (R&D) is critical to the future competitiveness of the U.S. uranium industry. Across all sectors, from initial mining through final fuel fabrication, consistent R&D expenditures are needed to devise and implement new manufacturing techniques and improved processes. R&D is particularly critical for uranium enrichment and fuel fabrication, as their uranium products are highly engineered and tailored to individual utility customers' specifications.

The oversupplied global uranium market has impacted the industry's ability to support continued R&D and expenditures have been consistently declining over the 2014 to 2018 period (*see* Figure 56).

Figure 56: Total Front-End U.S. Uranium Industry R&D Expenditures, 2014-2018



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 7 — 34 Respondents

[redacted]

[redacted] Other mining company respondents, including both existing mining companies and those owning deposits for future development, have limited available working capital. These firms prioritize the maintenance of existing sites and development costs (particularly permitting) for future sites, and have no ability to spend on R&D. The lack of R&D spending by mining companies, caused by poor uranium market conditions, will negatively affect their long-term competitiveness. These firms will not be able to develop new production methods and techniques- for example, [redacted] noted that poor economic conditions caused them to significantly cut R&D expenditures. [redacted]

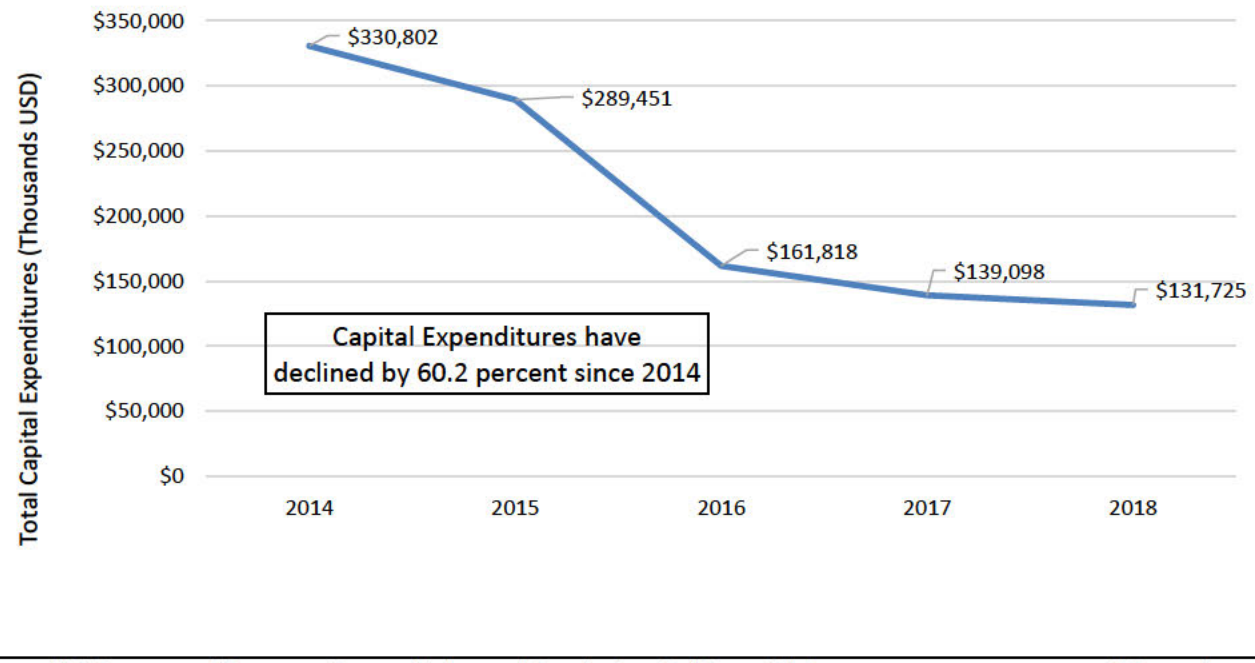
Although U.S. uranium firms are currently able to fund a small amount of R&D, their limited ability to invest in this area will constrain future

growth. Depressed uranium prices, caused by artificially low-priced imports, oblige U.S. firms to cut costs wherever possible, particularly in R&D. Low R&D expenditures will, in turn, inhibit U.S. firms from being competitive on a global level.

9. Capital Expenditures

All sectors of the U.S. uranium industry are capital-intensive. Mining companies hold significant capital investments in their deposits and the associated mining equipment; converters and enrichers hold significant investments in their proprietary conversion and enrichment processes; and fuel fabricators also have significant investments in the equipment and facilities needed to make fuel assemblies. Capital investment in the industry, however, has been hampered by poor uranium market conditions, with capital expenditures across the U.S. uranium industry falling by 60.2 percent from $330.8 million in 2014 to $131.7 million in 2018 (*see* Figure 57).

Figure 57: Total Front-End U.S. Uranium Industry Capital Expenditures, 2014-2018



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 6a — 18 Respondents

Global uranium market conditions have had various impacts on different stages of the fuel cycle. [redacted] Both of these firms are representative of the effect of global import trends on U.S. uranium mining as well

as U.S. uranium enrichment. Excess global supply of uranium concentrate, as well as excess global capacity to produce enriched material, places pressure on domestic U.S. producers, thus impacting their ability to invest in expanding productive capacity.

In contrast, however, U.S. fuel fabricators reported an increase in capital expenditures over the 2014 to 2018 period. [redacted] These increases indicate the comparatively strong state of the U.S. fuel fabrication sector. Due to prohibitive tariffs and reporting requirements associated with imported fuel assemblies, U.S. nuclear power generators opt to have their assemblies produced in the United States. U.S. fuel fabricators do not experience the same market pressures as do U.S. producers of uranium concentrate and enriched uranium.

However, should demand for nuclear fuel in the U.S. drop due to continued or accelerated reactor retirements, these firms will likely experience financial pressures that will force them to cut capital expenditures. In addition, long-term Russian and Chinese efforts to sell fuel directly to U.S. nuclear electric power utilities will also negatively impact domestic fuel fabricators.

A viable U.S. uranium industry must be able to make adequate capital expenditures to maintain existing production levels and prepare for future

expansion. However, in the current depressed uranium market, it is not possible for U.S. firms to do so.

C. Trade Actions: Anti-Dumping and Countervailing Duties

The U.S. Government has taken action against artificially low-priced uranium imports. Several anti-dumping investigations conducted by the Department and the U.S. International Trade Commission (USITC) affirm that many sources of imported uranium have engaged in dumping and other anti-competitive practices to the detriment of U.S. producers. Figure 58 lists USITC investigations into uranium imports since 1991:

Figure 58: U.S. International Trade Commission Uranium Cases Since 1991

Country	Date	Finding
Union of Soviet Socialist Republics (U.S.S.R.)	December 23, 1991	Affirmative
Russia, Belarus, Ukraine, Moldova, Georgia, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan*	June 3, 1992	Affirmative
Tajikistan	July 8, 1993	Negative
Ukraine	July 8, 1993	Affirmative
Kazakhstan	July 13, 1999	Negative
Ukraine	August 22, 2000	Negative
Russia (First Review of 1992 Determination)	August 22, 2000	Affirmative
France, Germany, the Netherlands, and the United Kingdom	February 4, 2002	Affirmative
Russia (Second Review of 1992 Determination)	August 2006	Affirmative
France (First Review of 2002 Determination)	December 2007	Affirmative
Russia (Third Review of 1992 Determination)	February 2012	Affirmative
Russia (Fourth Review of 1992 Determination)	September 2017	Affirmative
France (Third Review of 2002 Determination)	November 2018	Negative

*The cases determined on June 3, 1992 were a continuation of the December 23, 1991 anti-dumping case against the U.S.S.R. As the U.S.S.R. was dissolved December 25, 1991; the International Trade Commission opened cases against the twelve former Soviet republics.

Source: USITC

U.S.S.R. Less Than Fair Value Sales

In December 1991, the Department and the USITC determined that imports of uranium from the U.S.S.R., including natural and enriched uranium, were sold in the U.S. at less than fair value and threatened material injury to the U.S. uranium industry.[139] Following the dissolution of the U.S.S.R. in the same month, the single investigation was then transformed into twelve separate investigations, which covered most former Soviet republics.[140] In June 1992, the Department and USITC found that uranium imports from each of these republics were sold at less than fair value and threatened to materially injure U.S. producers. Subsequently, six of the republics- Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Ukraine, and Uzbekistan- signed agreements with the U.S. government to suspend the underlying antidumping duty investigations. These suspension agreements permitted the countries in question to import defined amounts of uranium into the United States, thereby avoiding the imposition of antidumping duty orders and the resulting duties.

After 1992, most of the antidumping duty orders and suspension agreements had been terminated pursuant to proceedings; the Department and USITC

[139] U.S. International Trade Commission. *Uranium from the U.S.S.R." Investigation No. 731-TA-539 (Preliminary).* (Washington, DC: 1991). https://www.usitc.gov/publications/701_731/pub2471.pdf

[140] "Uranium from Russia: Investigation No. 731-TA-539-C (Fourth Review)." USITC. (September 2017).

determined that imports of uranium from most of the Soviet republics were not materially injuring, or threatening to materially inure, U.S. industry. By 2000, only the agreement with Russia remained in force. In its 2000, 2006, 2012, and 2017 reviews of the Russian Suspension Agreement (RSA), USITC reaffirmed that imports of Russian uranium beyond the quantities permitted in the RSA would lead to a "recurrence of material injury" to the U.S. uranium industry.[141]

France, Germany, the Netherlands, and the United Kingdom

In December 2000, United States Enrichment Corporation (now Centrus Energy Corp.) filed a petition with the Department and USITC concerning imports of low-enriched uranium (LEU) from France, Germany, the Netherlands, and the United Kingdom. In February 2002, USITC concluded that LEU imports from these countries were sold inside the U.S. at less than fair value and had a "significant adverse impact" on domestic U.S. LEU production.[142] Commerce accordingly imposed countervailing duties on LEU imports from all of the above countries as well as anti-dumping duties on French imports.

Subsequent actions by the Department revoked all of the countervailing duties by May 2007. However, the anti-dumping duties on French LEU remained

[141] Ibid. 1.

[142] U.S. International Trade Commission. *Low Enriched Uranium from France, Germany, the Netherlands, and the United Kingdom,* 18. Investigation Nos. 701-TA-409-412 and 731-TA-909, Final. (Washington, DC: 2002). https://www.usitc.gov/publications/701_731/pub3486.pdf

in place. Further USITC reviews in December 2007 and December 2013 affirmed that the anti-dumping duties were needed to deter less than fair value sales of French LEU. Following a final review in November 2018 and a lack of domestic interested parties, the Department revoked the anti-dumping duties on French LEU on March 15, 2019.[143]

Prior actions by USITC and the Department support the U.S. Government's broader concern about the viability of the domestic uranium industry as well as the clear impact of anticompetitive practices by non-U.S. suppliers on U.S. producers.

D. Displacement of Domestic Uranium by Excessive Quantities of Imports has the Serious Effect of Weakening Our Internal Economy

1. U.S. Production is Well below Demand and Utilization Rates are Well Below Economically Viable Levels

Based on the Department's 2019 survey data, U.S. uranium production is well below U.S. demand even though adequate capabilities and resources exist. In 2018, U.S. utility requirements were about 51.9 million pounds of U308 to run all reactors at full capacity, and total U.S. licensed and operating uranium production capacity was about 226 million pounds of U308. However, U.S. uranium production in 2018 was less than two million pounds of U308 (*see* Figure 59).

[143] Low-Enriched Uranium from France: Final Results of Sunset Review and Revocation of Antidumping Duty Order, *Federal Register* 84 FR 9493, (March 15, 2019), https://www federalregister.gov/documents/2019/03/15/2019-04882/low-enriched-uranium-from-france-final-results-of-sunset-review-and-revocation-of-antidumping-duty

Figure 59: U.S. Uranium-related Production and Use

Current State of Uranium Ore & ISR-Mines (as of 2018)	
Active Nuclear Reactors in the U.S.	98
Annual U308 Needed to Run All Reactors at Full Capacity	51,890,163 Pounds
Total U308 Production in U.S.	709,806 Pounds
Total Operating U308 Production Capacity in U.S.	225,646,340 Pounds
Total Licensed U308 Production Capacity in U.S.	237,448,340 Pounds
Total U308 Production in U.S.	723,000 Pounds[1]
Total Operating U308 Production Capacity in U.S.	45,500,750 Pounds[1]
Total Licensed U308 Production Capacity in U.S.	49,001,000 Pounds[1]

[1] includes mined and milled products produced by millers only

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 3a, 4a
Nuclear Power Operator Sector Survey, Tab 3a

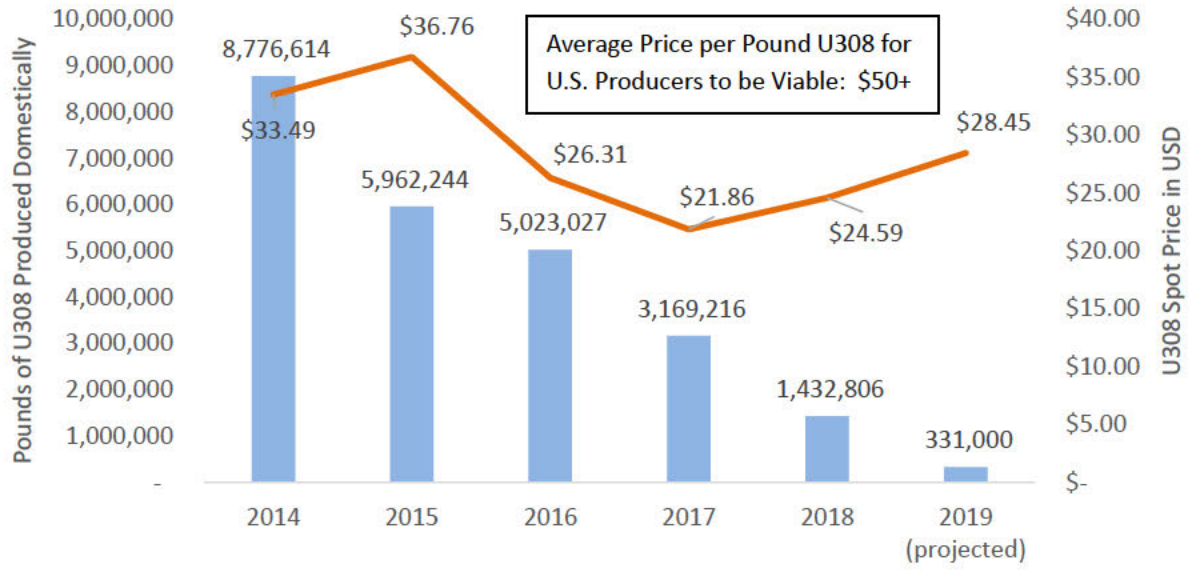
The average projected utility requirements of U308 for 2019 to 2025 are 280 million pounds. These variations are due to the 2019 decommissioning of two reactors with potentially eleven more reactors closing by 2025. In addition, four new reactors will be coming online by 2020.[144] Despite this demand, the prognosis for the U.S. uranium industry worsens with only 331,000 pounds of U308 production in 2019, which is 53 percent lower than 2018 and is only six percent of 2014 levels.

This decline is largely due to unfavorable market conditions. For example, the 25 mines that are currently idled/in standby said the primary factor prohibiting restart is low uranium spot prices. An additional two mines are completely shut down due to low uranium spot prices. Total production by U.S. mines and mills of

[144] U.S. Nuclear Regulatory Commission

uranium ore and concentrates continues to decrease drastically as global uranium market conditions continue to decline (*see* Figure 60).

Figure 60: U.S. Production and Global Spot Price of U308



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 4a; Federal Reserve Bank of St. Louis

6 respondents

The low uranium spot price also contributes to utilization rates that are well below economically viable levels. According to BIS survey data, front-end U.S. uranium producers indicated widely varying capacity utilization rates needed to remain profitable, with the lowest recorded at 25 percent, and the highest recorded at 100 percent. The industry average capacity utilization rate U.S. uranium producers need to remain profitable is roughly 56 percent. In the recent past, the utilization rate has been 3/10 of one percent (0.3 percent) of licensed/operating capacity. The industry cannot sustain at these unprofitable rates.

However, once market conditions improve, U.S. uranium producers can justify restarting operations and/or starting new operations. Most U.S. uranium miners and millers are unable to produce at a viable level at the current low spot prices, but are ready to produce when economic conditions are more favorable (*see* Figure 61).

Figure 61: Current State of the U.S. Uranium Miners

	Under Development	Operating	Standby /Idle	Total
Underground	9	0	30	**39**
Open Pit /Surface	0	0	2	**2**
In-Situ Recovery	5	5	7	**17**
Total	**14**	**5**	**39**	**58**

- Of the 14 mines "under development," 6 are "permitted to operate" and 2 are ready to start operations.
- Of the 39 mines in "standby/idle," 28 are "permitted to operate" and 4 are ready to start operations.
- Of the 5 mines "operating," one (1) is expected to enter "standby/idle" (2019-2023).

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 3a

Of the uranium mining projects in idling/standby status, many indicated that it would take about one year to restart production, with a maximum time period estimated at four years and the minimum estimated at 30 days. The cost to fully restart production varied more widely with the maximum being $100 million, the minimum being $200 thousand, and the average being $12.8 million.

Furthermore, uranium deposits in the U.S. are vast (approximately 1.2 billion pounds of U308) and can be extracted when the price reaches a level for production to be economically viable (*see* Figures 62 and 63).

Figure 62: U.S. Uranium-related Production and Use

Current State of Uranium Ore & ISR-Mines (as of 2018)	
Active Nuclear Reactors in the U.S.	98
Annual U308 Needed to Run All Reactors at Full Capacity	51,890,163 Pounds
Total U308 Production in U.S.	709,806 Pounds
Total Operating U308 Production Capacity in U.S.	225,646,340 Pounds
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Total U308 Production in U.S.	723,000 Pounds[1]
Total Operating U308 Production Capacity in U.S.	45,500,750 Pounds[1]
Total Licensed U308 Production Capacity in U.S.	49,001,000 Pounds[1]

Future State (Projected beyond 2019)	
Total U3O8 Production in U.S. up to $30/pound of U308	9,108,000 pounds
Total U3O8 Production in U.S. up to $50/pound of U308	340,103,597 pounds
Total Undeveloped Resources in U.S. (measured +inferred)	1,126,337,293 pounds

[1] includes mined and milled products produced by millers only

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 3a, 4a; Nuclear Power Operator Survey, Tab 3a

58 Respondents

Figure 63: Undeveloped U.S. Uranium Resources

State	Measured Resources	Inferred Resources	Avg. Est. Production Cost	Effected FTEs
Arizona	19,434,000	21,850,000	[redacted]	[redacted]
Colorado	32,820,171	67,416,514		
Nebraska	15,300,000	3,000,000		
New Mexico	48,164,000	314,926,000		
South Dakota	17,999,000	818,000		
Texas	9,072,000	112,226,000		
Utah	22,128,640	14,778,265		
Virginia	119,000,000	--		
Wyoming	273,278,887	125,125,816		
U.S. Total	**557,196,698**	**660,140,595**		

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 3b

15 respondents

2. Domestic Uranium Production is Severely Weakened and Concentrated

As the U.S. uranium industry contracts and shuts down due to the imports adversely impacting its economic welfare and viability, domestic uranium production is severely weakened and concentrated. Since imports as a percentage of U.S. utilities' annual uranium consumption have increased to upwards of 94 percent, U.S. production of uranium concentrate has declined from 12.3 million pounds in 1989 to just 331,000 pounds of uranium concentrate projected for 2019. Consequently, the mills which process uranium ore are near to shuttering operations. [redacted]

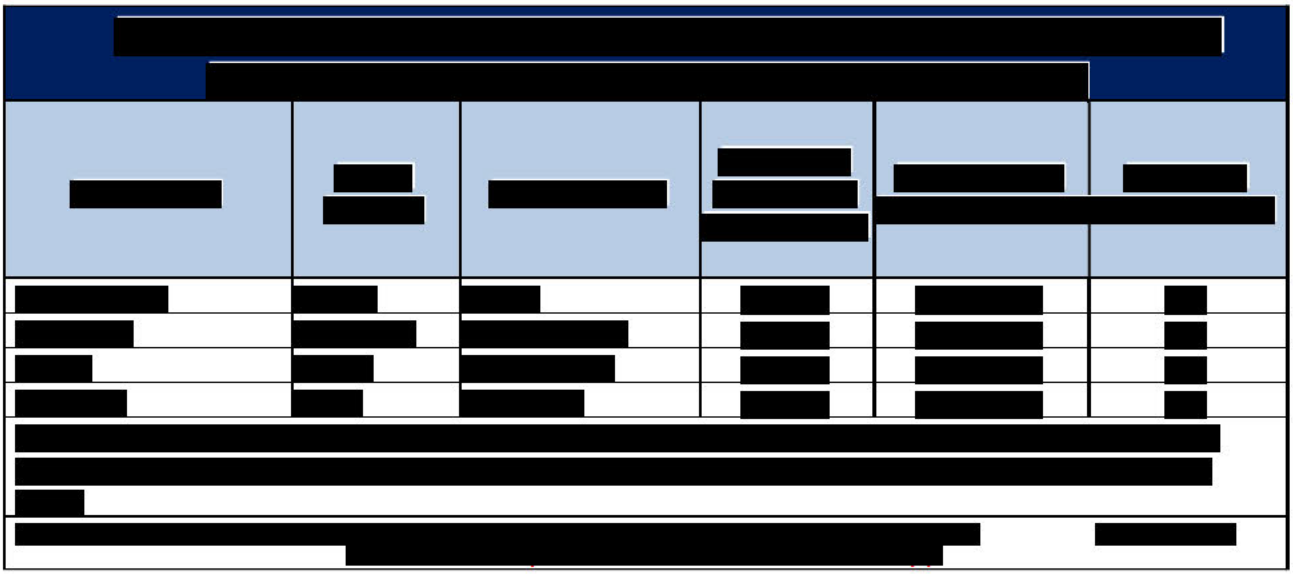
3. Reduction of Uranium Production Facilities Limits Capacity Available for a National Emergency and Threatens to Impair National Security

Key factors in this investigation include growth requirements of domestic industries to meet national defense requirements; however, reduction of uranium production facilities limits the capacity available in the event of a national emergency. The United States cannot be subject and should not be subject to foreign dependence in the face of potential uranium needs in an emergency scenario. The decline of the U.S. uranium production industry limits availability and puts the U.S. at risk, impairing national security. On the miners side, sales and export data show that U.S. producers are selling more product than they are

producing, indicating that contracts are being fulfilled with either inventory, spot market purchases, or other. U.S. mines have resorted to buying spot market uranium in order to fulfill contracts since it is cheaper than producing themselves.

The U.S. uranium industry's low production levels force U.S. nuclear power generators into heavy dependence on foreign uranium supplies. Of the 98 active U.S. nuclear reactors, only four have annual requirements less than 331,000 pounds U3O8 per year, which is the total U.S. production expected for 2019 (*see* Figure 65).

Projected 2019 U.S. uranium production would be sufficient to fuel only one of these reactors. [redacted] Low U.S. production levels denote that a sudden loss of access to foreign uranium supplies has the potential to severely disrupt the nuclear power plants that provide almost one-fifth of the nation's electricity.



[redacted] Therefore, a remedy to resolve the inhibiting factors to production must be implemented so that U.S. miners are once again reliable suppliers of uranium, and with additional U.S. capability to convert and enrich the mined uranium, U.S. utilities are able to fulfill their need of domestic uranium for national security or national emergency use.

As previously discussed, the stockpile maintained by DOE is anticipated to satisfy needs for LEU and HEU through 2041 and 2060 respectively. However, U.S. nuclear electric power utilities only maintain enough inventory of uranium to fuel their reactors for an average of [redacted] (*see* Figure 66). The compounded

effects of both minimal inventory and minimal U.S. production highlights the national security threat imposed by U.S. nuclear electric utilities' near complete dependence on imports of uranium to fuel their reactors. In the event of a supply disruption, U.S. utilities' would be unable to supply the 19 percent of U.S. electricity consumption they usually provide after [redacted]. The continued loss in U.S. production capabilities ensures that a disruption in supply to the nation's 98 reactors would be catastrophic to U.S. critical infrastructure.

E. Uranium Market Distortion by State-Owned Enterprises is a Circumstance that Contributes to the Weakening of the Domestic Economy

1. Excess Russian, Kazakh, and Uzbek Production Adversely Affects Global Markets and Creates a Dangerous U.S. Dependence on Uranium from These Countries

Although global uranium production increased by 42 percent between 2008 and 2016, the subsequent supply glut following the Fukushima disaster and reactor retirements has begun to affect production.[145] As the potential for new reactor construction increased, new mines came online to meet potential demand. In 2008, the world's uranium mines produced enough uranium to fulfill 70 percent of existing world demand. By 2016, global uranium production filled 98 percent of world demand.

However, the increasing pace of reactor retirements, cancellation of proposed new reactors, and excess supply caused by the shutdown of German and Japanese reactors all impacted the global uranium market. Accordingly, between 2016 and 2017, global uranium production dropped by 4.7 percent – remaining production could satisfy 93 percent of 2017 demand. As more reactors come

[145] "World Uranium Mining Production." World Nuclear Association. http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

online in certain regions, particularly in Asia, the Middle East, and Africa, global demand is expected to grow once more.

By 2025, the International Atomic Energy Agency estimates that global uranium demand could be as high as 68,920 metric tons – a 10 percent increase on 2016 levels. However, current poor market conditions, exacerbated by artificially low-priced SOE producers, have forced many producers in the U.S. and other countries to idle production or close mines entirely. U.S. and other market producers may therefore not be present in the market to take advantage of higher future demand.

Thus, while U.S. production declined by 16 percent between 2016 and 2017, Russian and Kazakh production declined only by 5.1 and 2.9 percent respectively (*see* Figure 67). Uzbek production remained constant. Even Canada and Australia, which have historically produced more than the U.S., cut their production to a greater degree than did Russia, Kazakhstan, and Uzbekistan.

Figure 67: Changes in Uranium Production, 2016-2017

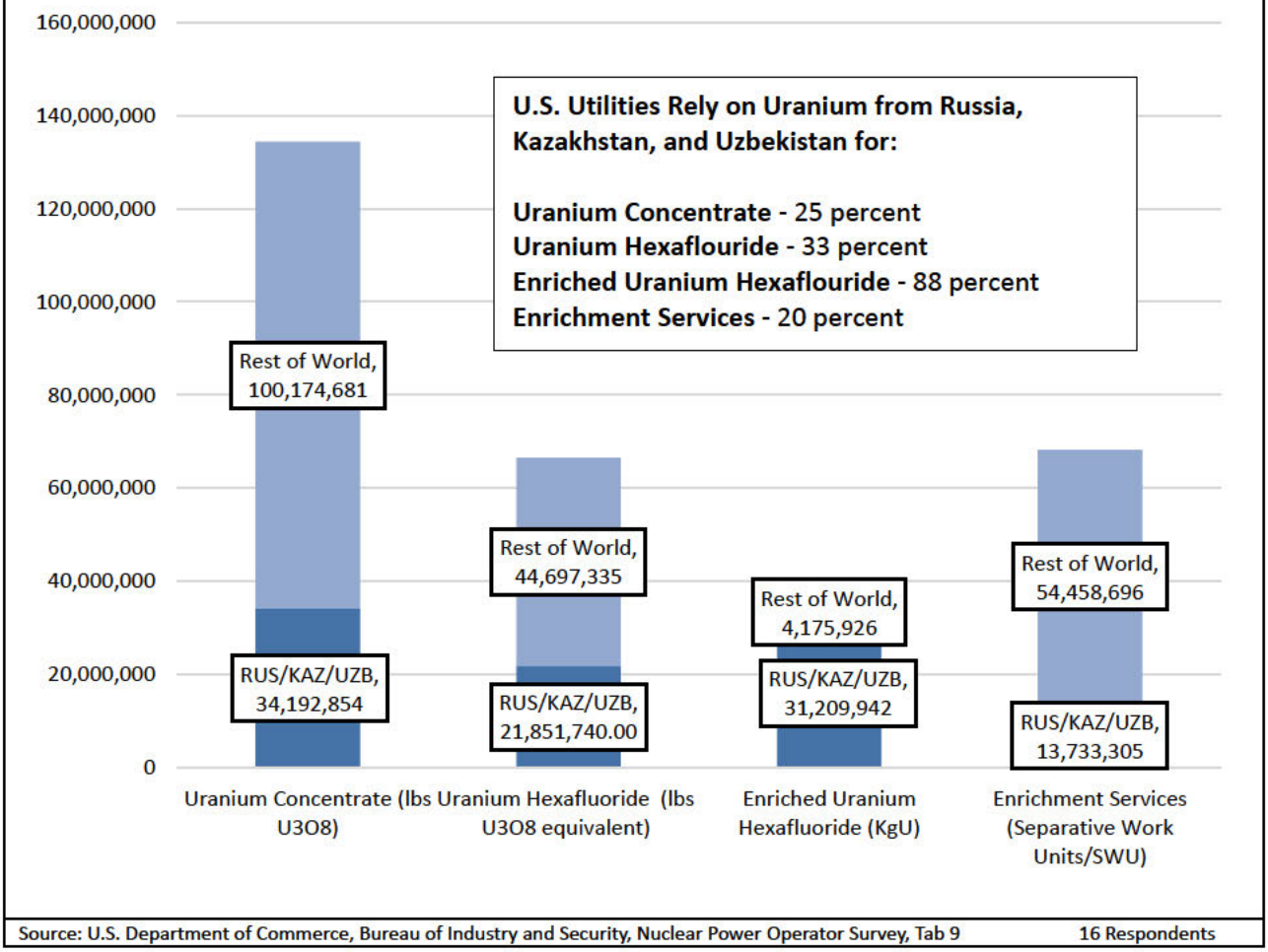
Country	2016 Production (Metric Tons Uranium)	2017 Production (Metric Tons Uranium)	Change in Production (Percentage)
United States	1,125	940	-16.4%
Canada	14,039	13,116	-6.55%
Australia	6,315	5,882	-6.86%
Russia	3,004	2,917	-2.89%
Kazakhstan	24,586	23,321	-5.14%
Uzbekistan	2404	2404	0
China	1616	1885	16.6%

Source: World Nuclear Association, March 2019, **2018 data has not been released.**

Russia's Rosatom, Kazakhstan's Kazatomprom, and Uzbekistan's Navoi are able to maintain higher production levels than most producers despite unfavorable global markets because they are state-owned enterprises. Should global market trends persist and uranium prices remain low, U.S. producers will not be able to compete with price-insensitive production in these countries.

As U.S. and other market production declines and Russian, Kazakh, and Uzbek production remains stable, U.S. utilities are purchasing increasing amounts of uranium products from these countries. Figure 68 shows the extent to which U.S. utilities rely on Russia, Kazakhstan, and Uzbekistan for a significant share of their uranium needs.

Figure 68: U.S. Utility Purchases of Uranium Products from Russia, Kazakhstan, and Uzbekistan, 2014-2018



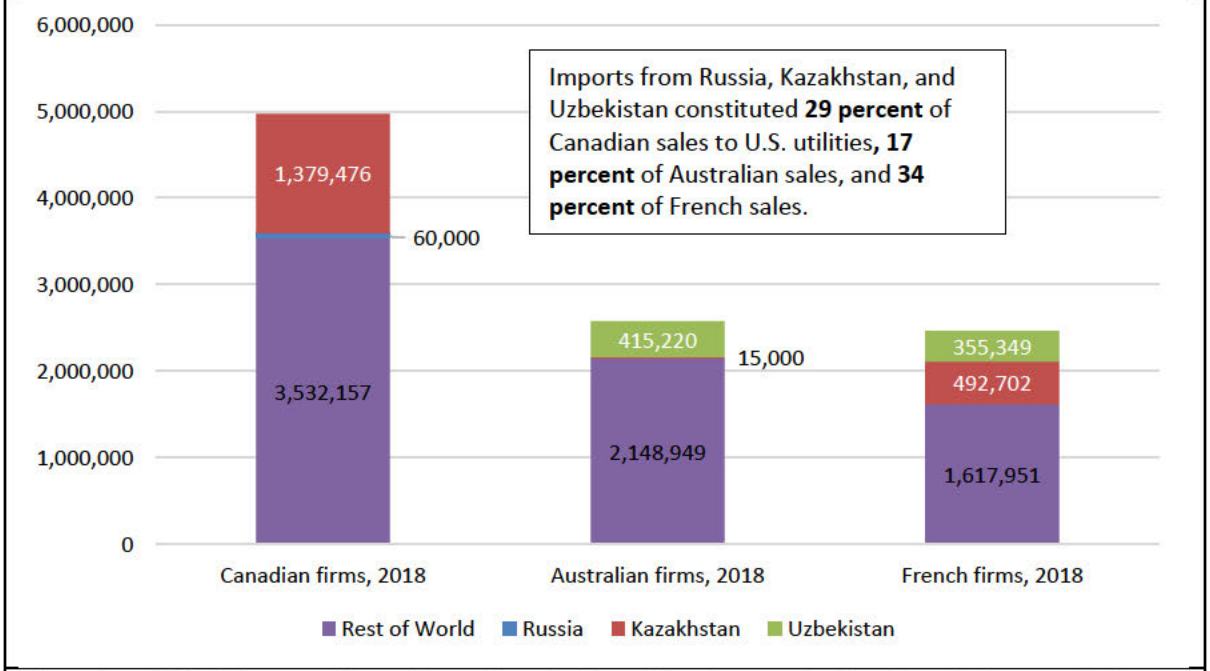
Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Operator Survey, Tab 9 16 Respondents

Between 2014 and 2018, U.S. utilities relied on material from Russia, Kazakhstan, and Uzbekistan for 25 percent of their uranium concentrate, 32 percent of their uranium hexafluoride, 14 percent of their conversion services, and 20 percent of their enrichment services. Consequently, U.S. utilities are dependent on imports from these countries to maintain normal operations at their nuclear generators. As U.S. and other market producers cut or cease uranium production

due to unfavorable market conditions, it is likely that U.S. utilities will increase purchases of uranium from price-insensitive Russian, Kazakh, and Uzbek producers.

Continued high levels of Russian, Kazakh, and Uzbek production is also affecting U.S. allies. As described in Chapter VI, Canadian and Australian producers have had to idle production at their own mines due to poor market conditions. Furthermore, to fulfill contracts with U.S. utilities, Canadian, Australian, and French producers have procured material from state-owned suppliers. Figure 69 shows that Canadian, Australian, and French producers used Russian, Kazakh, and Uzbek uranium to fulfill many 2018 contracts with U.S. utilities.

Figure 69: Uranium Concentrate Purchased by U.S. Utilities from French, Australian, and Canadian firms, 2018 (Pounds U3O8)



*"Rest of World" includes Australia, Brazil, Canada, Malawi, Namibia, Niger, South Africa, the United States, Ukraine, and unspecified West Africa.

Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Operator Survey, Tab 9 16 Respondents

Continued excess production of artificially low-priced uranium by Russia, Kazakhstan, and Uzbekistan will make U.S. and foreign market producers noncompetitive on global markets. As U.S. and other allied nations decrease their production due to poor market conditions, U.S. nuclear power generators will purchase increasing amounts of Russian, Kazakh, and Uzbek uranium to meet their needs.

Dependence on such imports raises a distinct national security concern. The Office of the Director of National Intelligence's 2019 Worldwide Threat Assessment identifies Russia's ambitions to expand its "global military,

commercial, and energy footprint" as an integral part of its strategy to "undermine the international order."[146]

U.S. utilities' direct dependence on Russian enriched uranium for 20 percent of their annual supply gives the Kremlin significant economic leverage. Moscow exercises further leverage through its *de facto* control of uranium exports from Kazakhstan and Uzbekistan. Although Kazakh and Uzbek SOEs are controlled by their respective governments and not Russia, a significant majority of uranium shipments from Kazakhstan and Uzbekistan transit through Russia on their way to U.S. customers.

[redacted]

[146] Coats, Daniel. Director of National Intelligence, Senate Select Committee on Intelligence. *Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community,* 37. January 29, 2019. https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf

In the event of increased political or potential military tensions, Russia could choose to ban uranium exports to the United States; denying U.S. utilities a significant share of their enriched uranium. Russia further possesses the military means to deny U.S. and U.S.-aligned countries access to Kazakh and Uzbek uranium exported through Russian ports, principally on the Baltic Sea.[147] In either

[147] Since the Russian annexation of Crimea and intervention in eastern Ukraine in 2014, Russia has steadily built up its military assets in the Baltic Sea region. Russia therefore could close Baltic Sea shipping lanes with comparative ease. Oder, Tobias. "The Dimensions of Russian Sea Denial in the Baltic Sea." Center for International Maritime Security, January 04, 2018. http://cimsec.org/dimensions-russian-sea-denial-baltic-sea/35157.

of these circumstances, U.S. utilities would conceivably be denied a significant percentage of their uranium requirements and could face critical fuel shortages.

2. The increasing presence of China in the global uranium market will further weaken U.S. and other market uranium producers

Although China's uranium industry has been developed primarily to serve the country's growing fleet of nuclear reactors, China is increasing its involvement in the global nuclear fuel industry.[148] China's involvement in the global nuclear fuel industry is an outgrowth of its domestic uranium procurement strategy. As China has only limited domestic uranium reserves, it has also acquired interests in uranium deposits outside China. This "two markets, two resources"[149] policy has led Chinese firms to acquire significant shares of mines in Kazakhstan and Namibia, with prospective developments in Niger and Canada. [150] China's activity in Namibia is of particular interest.[151] Namibia has two active uranium mines – Husab and Rossing. Chinese firms have a majority stake in Husab and purchased a majority stake in Rossing. However, the Rossing transaction is under review by the

[148] "China's Nuclear Fuel Cycle." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-fuel-cycle.aspx

[149] Pascale Massot and Zhan-Ming Chen. "China and the Global Uranium Market: Prospects for Peaceful Coexistence." *The Scientific World Journal*, 2013. https://www.hindawi.com/journals/tswj/2013/672060/

[150] "China's Nuclear Fuel Cycle." World Nuclear Association. http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-fuel-cycle.aspx

[151] "Rio Tinto to sell Rössing stake." *World Nuclear News*, November 26, 2018. http://www.world-nuclear-news.org/Articles/Rio-Tinto-to-sell-Rossing-stake

Namibia Competition Commission. A Chinese firm does have a 25 percent stake in the Langer Heinrich mine, but that mine was placed in care and maintenance in 2018 and thus cannot be characterized as active. These mines' production costs exceed current global uranium prices, and so cannot support commercial production. However, cost recovery is seemingly not a concern for Chinese-state owned producers.

Between 2014 and 2018, U.S. utilities purchased approximately 347,781 pounds of uranium concentrate, 2.33 million pounds of U3O8 equivalent of conversion services, and 1.4 million separative work units (SWU) of enrichment services- enough to supply 16 average reactors per year- from Chinese producers. U.S. utilities also have contracts with Chinese producers for at least 130,000 SWU between 2019 and 2023, indicating an interest in continued relationships with Chinese producers. U.S. utilities have also contracted with CGN Global Uranium Ltd., the trading arm of Chinese SOE China General Nuclear, for certain uranium purchases. Between 2014 and 2018, U.S. utilities purchased 800,000 pounds of uranium concentrate from CGN Global.

As the bulk of China's uranium concentrate production is consumed by domestic nuclear power generators, most Chinese exports of uranium will likely be in the form of enrichment services. Domestic Chinese enrichment capacity is increasing faster than domestic demand: by 2020, the country's enrichment

centrifuges will have a total capacity of 12 million SWU, compared to domestic demand of 9 million SWU.[152] Chinese producers intend to use this excess capacity to increase the country's presence in the nuclear fuels trade. A China National Nuclear Corporation (CNNC) executive remarked in 2013: "On the basis of securing its domestic supply [of SWU], CNNC will gradually expand its foreign markets and make China's fuel industry internationally competitive."[153] China's increasing control of global uranium deposits and its excess enrichment capacity will allow it to further enter the nuclear fuels market and undermine U.S. and other market producers.

3. Increasing global excess uranium production will further weaken the internal economy as U.S. uranium producers will face increasing import competition.

Continued high levels of production by state-owned enterprises in Russia, Kazakhstan, Uzbekistan, and China will place further financial pressure on U.S. uranium producers. U.S. uranium concentrate production, which declined by 94 percent between 2014 and 2018, will be non-existent in the near future as subsidized foreign production continues.

[152] Hui Zhang, "China's Uranium Enrichment Capacity: Rapid Expansion to Meet Commercial Needs", (Cambridge: Harvard Kennedy School, 2015), 32.

[153] Ibid., 34.

Foreign market producers are not immune from the effects of state-owned producers either. As described in Chapter VI, Canadian and Australian producers have had to idle production at their own mines due to poor market conditions. Furthermore, to fulfill contracts with U.S. utilities, Canadian, Australian, and French producers have procured material from state-owned suppliers.

VIII. Conclusion

A. Determination

Based on these findings, the Secretary of Commerce has concluded that the present quantities and circumstance of uranium imports are "weakening our internal economy" and "threaten to impair the national security" as defined in Section 232. An economically viable and secure supply of U.S.-sourced uranium is required for national defense needs. International obligations, including agreements with foreign partners under Section 123 of the Atomic Energy Act of 1954, govern the use of most imported uranium and generally restrict it to peaceful, non-explosive uses. As a result, uranium used for military purposes must generally be domestically produced from mining through the fuel fabrication process. Furthermore, the predictable maintenance and support of U.S. critical infrastructure, especially the electric power grid, depends on a diverse supply of uranium, which includes U.S.-sourced uranium products and services.

The Secretary further recognizes that the U.S. uranium industry's financial and production posture has significantly deteriorated since the Department's 1989 Report. That investigation noted that U.S. nuclear power utilities imported 51.1 percent of their uranium requirements in 1987. By 2018, imports had increased to 93.3 percent of those utilities' annual requirements. Based on comprehensive 2019 industry data provided by U.S. uranium producers and U.S. nuclear electric power

utilities to the Department in response to a mandatory survey, U.S. utilities' usage of U.S. mined uranium has dropped to nearly zero. [redacted] Based on the current and projected state of the U.S. uranium industry, the Department has concluded that the U.S. uranium industry is unable to satisfy existing or future national security needs or respond to a national security emergency requiring a significant increase in domestic uranium production.

Absent immediate action, closures of the few remaining U.S. uranium mining, milling, and conversion facilities are anticipated within the next few years. Further decreases in U.S. uranium production and capacity, including domestic fuel fabrication, will cause even higher levels of U.S. dependence on imports, especially from Russia, Kazakhstan, Uzbekistan, and China. Increased imports from SOEs in those countries, and in particular Russia and China, which the 2017 National Security Strategy noted present a direct challenge to U.S. influence, are detrimental to the national security.[154] The high risk of loss of the remaining U.S. domestic uranium industry, if the present excessive level of imports continue, threatens to impair the national security as defined by Section 232.

[154] U.S. White House Office. *National Security Strategy of the United States of America. (*Washington, DC: 2017), 2 https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905-2.pdf

The Secretary has determined that to remove the threat of impairment to national security, it is necessary to reduce imports of uranium to a level that enables U.S. uranium producers to return to an economically competitive and financially viable position. This will allow the industry to sustain production capacity, hire and maintain a skilled workforce, make needed capital expenditures, and perform necessary research and development activities. A modest reduction of uranium imports will allow for the revival of U.S. uranium mining and milling, the restart of the sole U.S. uranium converter, and a reduction in import challenges to fuel fabricators, while also recognizing the market and pricing challenges confronting the U.S. nuclear power utilities.

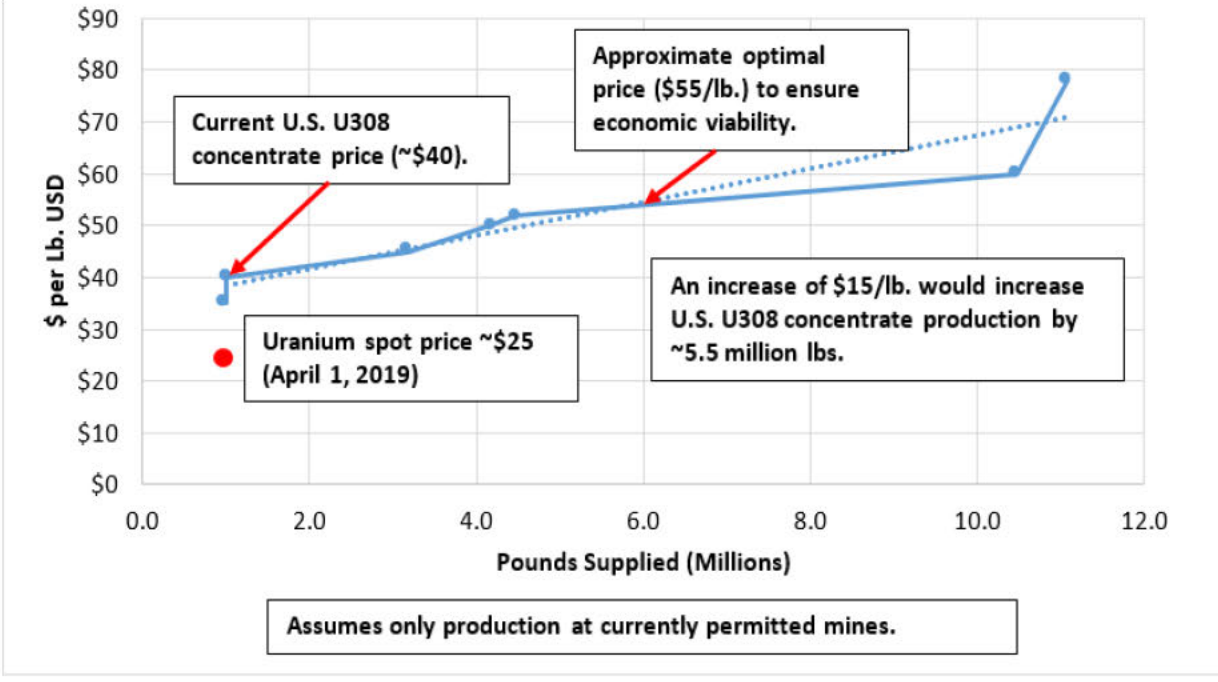
Recommendation

Due to the threat to the national security, as defined in Section 232, from excessive uranium imports, the Secretary recommends that the President take immediate action by adjusting the level of these imports through implementation of an import waiver to achieve a phased-in reduction of uranium imports. The reduction in imports of uranium should be sufficient to enable U.S. producers to recapture and sustain a market share of U.S. uranium consumption that will allow for financial viability, and enable the maintenance of a skilled workforce and the production capacity and uranium output needed for national defense and critical infrastructure requirements. The reduction imposed should be sufficient to enable

U.S. producers to eventually supply 25 percent of U.S. utilities' uranium needs based on 2018 U.S. U308 concentrate annual consumption requirements.

Based on the survey responses, the Department has determined that U.S. uranium producers require an amount equivalent to 25 percent of U.S. nuclear power utilities' 2018 annual U308 concentrate consumption to ensure financial viability. Based on the Department's analysis, if U.S.-mined uranium supplied 25 percent of U.S. nuclear power utilities' annual U308 concentrate consumption, U.S. uranium prices will increase to approximately $55 per pound (*see* Figure 71). The current spot price is low due to distortions from SOEs.

Figure 71: U.S. Uranium Supply Curve



Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Tab 4b

The $55 per pound price will increase mine capacity to the point where U.S. uranium mines can supply approximately 6 million pounds of uranium concentrate per year, which is approximately 25 percent of U.S. nuclear power utilities' consumption for U308 concentrate in any given year.

The Secretary recommends that the import reduction be phased in over a five-year period. This will allow U.S. uranium mines, mills, and converters to reopen or expand closed or idled facilities; hire, train and maintain a skilled workforce; and make necessary investments in new capacity. This phased-in approach will also allow U.S. nuclear power utilities time to adjust and diversify their fuel procurement contracts to reintroduce U.S. uranium into their supply chains.

The Secretary recommends that either a targeted or global quota be used to adjust the level of imports and that such quota should be in effect for a duration sufficient to allow the necessary time needed to stabilize and revitalize the U.S. uranium industry. According to survey responses, the average time to restart an idle uranium production facility is two to five years, and several additional years are needed to add new capacity. Market certainty, which can be provided by long-term contracts with U.S. nuclear power utilities, is needed to build cash flow, pay down debt, and raise capital for site modernization; workforce recruitment; and to conduct environmental and regulatory reviews.

Option 1 – Targeted Zero Quota

This targeted zero quota option would prohibit imports of uranium from Kazakhstan, Uzbekistan, and China (the "SOE countries") to enable U.S. uranium producers to supply approximately 25 percent of U.S. nuclear power utility consumption. A U.S. nuclear power utility or other domestic user would be eligible for a waiver that allows the import of uranium from the SOE countries, with any import of uranium from Russia subject to the Russian Suspension Agreement, after such utility or user files appropriate documentation with the Department. In the case of a U.S. nuclear power utility, the documentation must show that such utility has a contract or contracts to purchase for their consumption on an annual basis not less than the percentage of U.S. produced uranium U308 concentrate shown in the phase-in table below.

Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.					
Year	2020	2021	2022	2023	2024 and beyond
Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.	5%	10%	15%	20%	25%

Phased-in incrementally over five years, this option will help facilitate the reopening and expansion of U.S. uranium mining, milling, and conversion facilities, and will ensure that U.S. uranium producers can make investments required for future financial viability without causing unintentional harm to other market economy uranium producers. This option avoids undue financial harm to

U.S. nuclear power utilities by affording them sufficient time to adjust their fuel procurement strategies.

The zero quota on uranium imports from SOE countries would not apply to uranium imports from SOE countries for use by U.S. milling, conversion, enrichment, and fuel fabrication services' that produce uranium products for export from the United States. A U.S. milling, conversion, enrichment, or fuel fabricator seeking to import uranium from an SOE country for use to produce uranium products for export would need to file appropriate documentation with the Department to obtain a waiver for the import of such uranium for export.

The Secretary believes that this option to impose a zero quota for imports of uranium from SOE countries, while continuing to allow unrestricted importation of uranium from Canada, Australia, and EURATOM member countries based on their security and economic relationships with the United States, should address the threatened impairment of U.S. national security. This would be accomplished by promoting the economic revival of the U.S. uranium industry, so long as there is not significant transshipment or reprocessing of SOE country uranium through these unrestricted countries. The Department will monitor these unrestricted imports to ensure there is not significant transshipment, reprocessing, or book transfers from SOE countries to unrestricted countries in an attempt to circumvent and undermine the U.S. uranium producers' ability to provide 25 percent of U.S.

annual U308 concentrate consumption. Many companies in unrestricted countries supply uranium sourced from SOE countries. Consequently, up to one-third of the materials delivered to U.S. nuclear power utilities, at this time, are not sourced directly from the country of import.

Imports of uranium from Russia under a waiver would also subjected to the Russian Suspension Agreement. This option assumes that such agreement will continue to be in effect over the relevant time period and would apply to any Russian uranium imports by U.S. nuclear power utilities, thus holding Russian uranium imports to their current level of approximately 20 percent of U.S. enrichment demand. In the event that the Russian Suspension Agreement is not extended and terminates, then the Secretary recommends that a quota on uranium imports under a waiver of Russian Uranium Products (as defined in the Russian Suspension Agreement) of up to 15 percent of U.S. enrichment demand be imposed. If adopted this quota would be administered by the Department in the same manner as the Russian Suspension Agreement is presently administered.

The adjustment of imports proposed under this option would be in addition to any applicable antidumping or countervailing duties collections.

To complement the proposed trade action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear and

other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy and will make recommendations to the President regarding whether it should be modified, extended, or terminated.

Option 2 – Global Zero Quota

This option would establish a zero quota on imports of uranium from all countries until specific conditions are met to enable U.S. producers to supply 25 percent of U.S. nuclear power utilities' annual consumption of uranium U308 concentrate. A U.S. nuclear power utility or other domestic user would be eligible for a waiver to import uranium from any country after submitting appropriate documentation to the Department. In the case of a U.S. nuclear power utility, the documentation must show that such utility has a contract or contracts to purchase

for their consumption on an annual basis not less than the percentage of U.S. produced uranium U308 concentrate shown in the phase-in table below.

Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.					
Year	2020	2021	2022	2023	2024 and beyond
Percent of Annual U308 Concentrate Consumption Required to be Sourced from the U.S.	5%	10%	15%	20%	25%

Phased-in incrementally over five years, this option will help facilitate the reopening and expansion of U.S. uranium mining, milling, and conversion facilities, and will ensure that U.S. uranium producers can make investments required for future financial viability. This option avoids undue financial harm to U.S. nuclear power utilities by affording them sufficient time to adjust their fuel procurement strategies.

The zero quota on uranium imports would not apply to uranium imports for use by U.S. milling, conversion, enrichment, and fuel fabrication services' that produce uranium products for export from the United States. A U.S. milling, conversion, enrichment, or fuel fabricator seeking to import uranium for use to produce uranium products for export would need to file appropriate documentation with the Department to obtain a waiver for the import of uranium for export.

The Department will provide adequate time for U.S. industry to receive a waiver prior to a zero quota being implemented globally. Based on information

received during the investigation, the Department believes that this option will not cause undue burdens.

The Secretary believes that this option to impose a zero quota for imports of uranium will address the threatened impairment of U.S. national security by promoting the economic revival of the U.S. uranium industry. This option also prevents the possibility of transshipment of SOE overproduction through third countries and avoids undue harm to U.S. enrichment and fuel fabrication export operations. These domestic export operations rely on an ability to access working uranium stock regardless of the specific mining origin of a given uranium-based material.

Tennessee Valley Authority (TVA) purchases of Canadian UO_3 natural uranium diluent in its execution of the National Nuclear Security Administration's current highly-enriched uranium (HEU) down-blending campaign would be excluded from the zero quota on imports of uranium. In addition, any transfer pursuant to a Mutual Defense Agreement that references special nuclear material would be excluded from the zero quota on imports of uranium.

Imports of uranium from Russia under a waiver would also be governed by the Russian Suspension Agreement. This option assumes that such agreement will continue to be in effect over the relevant time period and would apply to any Russian uranium imports by U.S. nuclear power utilities, thus holding Russian

uranium imports to their current level of approximately 20 percent of U.S. enrichment demand. In the event that the Russian Suspension Agreement is not extended and terminates, then the Secretary recommends that a quota on uranium imports under a waiver of Russian Uranium Products (as defined in the Russian Suspension Agreement) of up to 15 percent of U.S. enrichment demand be imposed. If adopted this quota would be administered by the Department in the same manner as the Russian Suspension Agreement is presently administered.

The adjustment of imports proposed under this option would be in addition to any applicable antidumping or countervailing duties collections.

To complement the proposed trade action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear and other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy to determine if it should be modified, extended, or terminated.

Option 3 – Alternative Action

Should the President determine that the threatened impairment of national security does not warrant immediate adjustment of uranium imports at this time but that alternative action should be taken to improve the condition of the U.S. uranium industry to enable the U.S. industry to supply 25 percent of U.S nuclear power utilities annual consumption of uranium U308 concentrate, the President could direct the Department of Defense (DOD) and the Department of Energy (DOE) to report to the President within 90 days on options for increasing the economic viability of the domestic uranium mining industry. The report should include, but not be limited to, recommendations for: (1) the elimination of regulatory constraints on domestic producers; (2) incentives for increasing investment; and (3) ways to work with likeminded allies to address unfair trade practices by SOE countries, including through trade remedy actions and the negotiation of new rules and best practices. The President could also direct the United States Trade Representative to enter into negotiations with the SOE

countries to address the causes of excess uranium imports that threaten the national security.

To complement the proposed alternative action, the Secretary recommends that the Federal Energy Regulatory Commission (FERC) act promptly to ensure that regulated wholesale power market regulations adequately compensate nuclear and other fuel-secure generation resources. Specifically, FERC should determine whether current market rules, which discriminate against secure nuclear fuel generation resources in favor of intermittent resources, such as natural gas, solar, and wind, result in unjust, unreasonable, and unduly discriminatory rates that distort energy markets, harm consumers, and undermine electric reliability. If so, FERC should consider taking appropriate action to ensure that rates are just and reasonable.

The Department of Commerce, in consultation with other appropriate departments and agencies, will monitor the status of the U.S. uranium industry and the effectiveness of this remedy and recommend to the President if any additional measures are needed. Alternatively, the Secretary may initiate another investigation under Section 232.

B. Economic Impact of 25 Percent U.S.-Origin Requirement

The Department analyzed the economic impact of a 25 percent U.S.-origin uranium concentrate requirement on the U.S. uranium mining industry as well as U.S. nuclear power utilities. The Department's analysis and modeling indicates that U.S. uranium mining and milling will substantially benefit from the 25 percent U.S.-origin uranium concentrate requirement and will return to an economically competitive and financially viable industry. U.S. nuclear power utilities will experience only marginal increases in fuel costs and slight decreases in revenue due to usage of U.S.-origin uranium concentrate for 25 percent of their fuel supply.

The Department's analysis indicates if Option 1 or 2 is implemented, U.S. uranium producers between 2020 and 2024 will see a substantial increase in their production compared to the projected 2019 level of 331,000 pounds U3O8 equivalent (*see* Figure 72).

Figure 72. Projected U.S. Uranium Concentrate Production and Per-Pound Price, 2020-2024

Price Per Pound Given Projected U.S. Demand		
Year, U.S. Content Required	Projected U.S. Concentrate Demand (Lbs. U308)	Projected Price Per Lb.
2020, 5%	1,208,975	$36.21
2021, 10%	2,417,951	$41.23
2022, 15%	3,626,926	$46.26
2023, 20%	4,835,901	$51.29
2024, 25%	6,044,877	$56.31

Source: U.S. Department of Commerce, Bureau of Industry and Security, Front-End Survey, Q4B

13 respondents

Over the five-year implementation, U.S. uranium concentrate producers, including mines and mills, will see prices rise to a level that will support sustained production of approximately 6 million pounds U3O8 equivalent per year, or 25 percent of U.S. concentrate requirements based on 2018 data.

[redacted] By acquiring more U.S.-origin uranium concentrate, U.S. utilities will need to have at least some of that material converted domestically. [redacted]

[redacted]

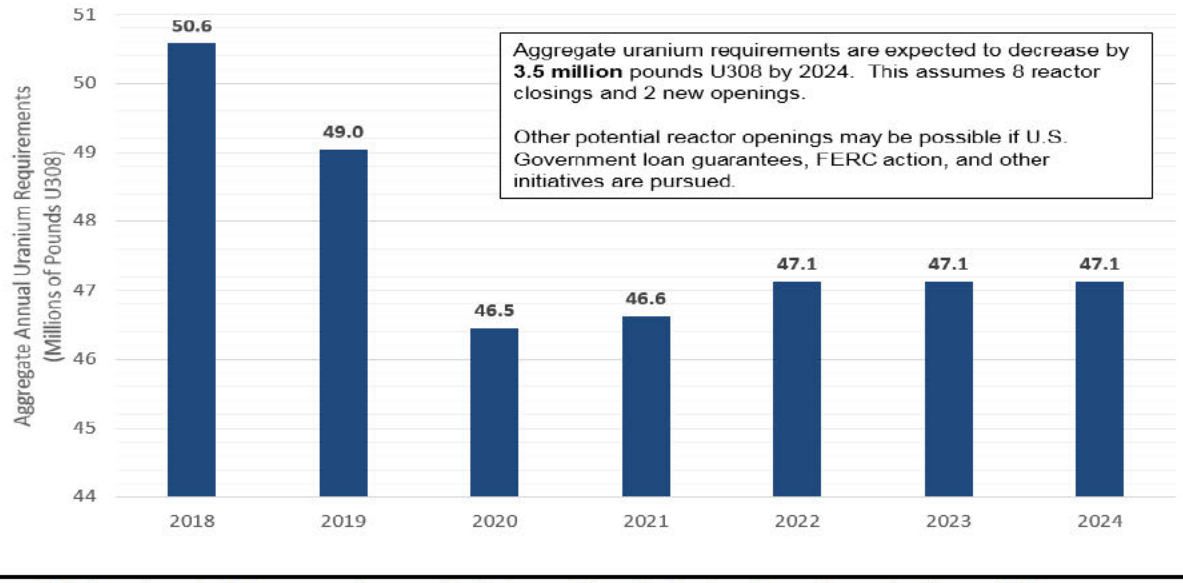
[redacted]

[redacted]

[redacted] Preserving ConverDyn's conversion capacity is imperative to preserving the U.S.'s entire nuclear fuel cycle capabilities, particularly as DOE looks to build a new enrichment facility in the coming decades.

U.S. utilities will experience only marginal effects from the 25 percent U.S.-origin requirement. Due to reactor retirements, overall uranium requirements are expected to decrease by approximately 6.9 percent over the next five years (*see* Figure 74).

Figure 74. U.S. Utility Uranium Requirements, 2018; Projected 2019-2024

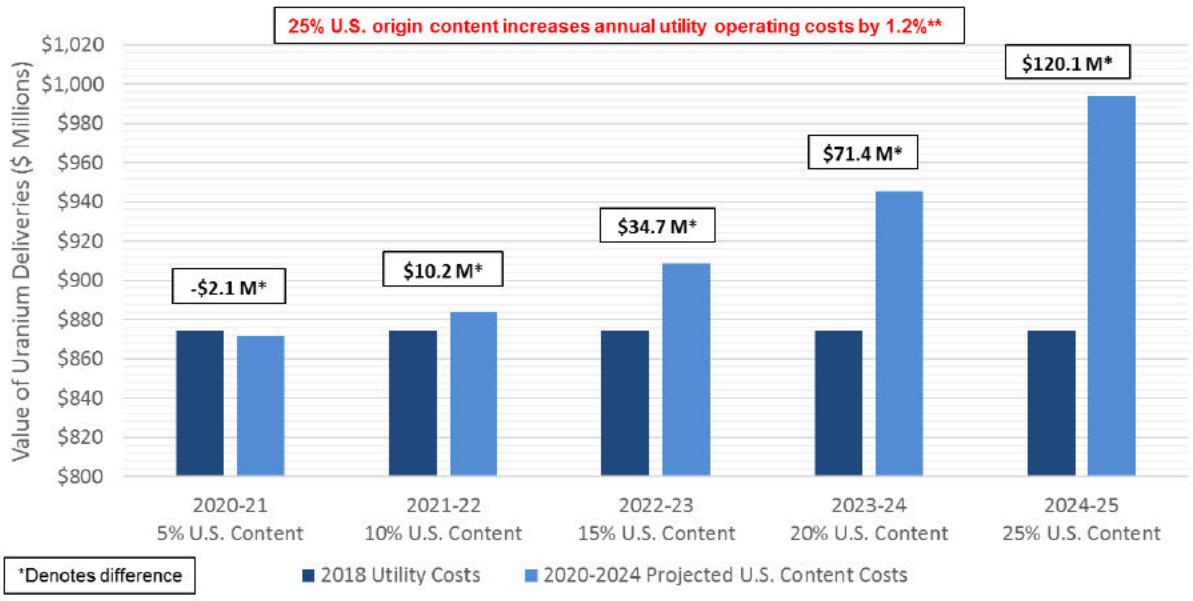


Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q3B

98 reactors

Based on this projected level of consumption, the Department's modelling indicates that a 25 percent U.S.-origin requirement will increase aggregate utility fuel costs by $120.1 million, or 13.72 percent, between 2020 and 2024. This is based on aggregated utility fuel costs of nearly $900 million in 2018 (*see* Figure 75).

Figure 75. U.S. Utility Aggregate Change in Projected Operating Costs: Phased-In 25 Percent U.S. Origin Requirement, 2020-2024



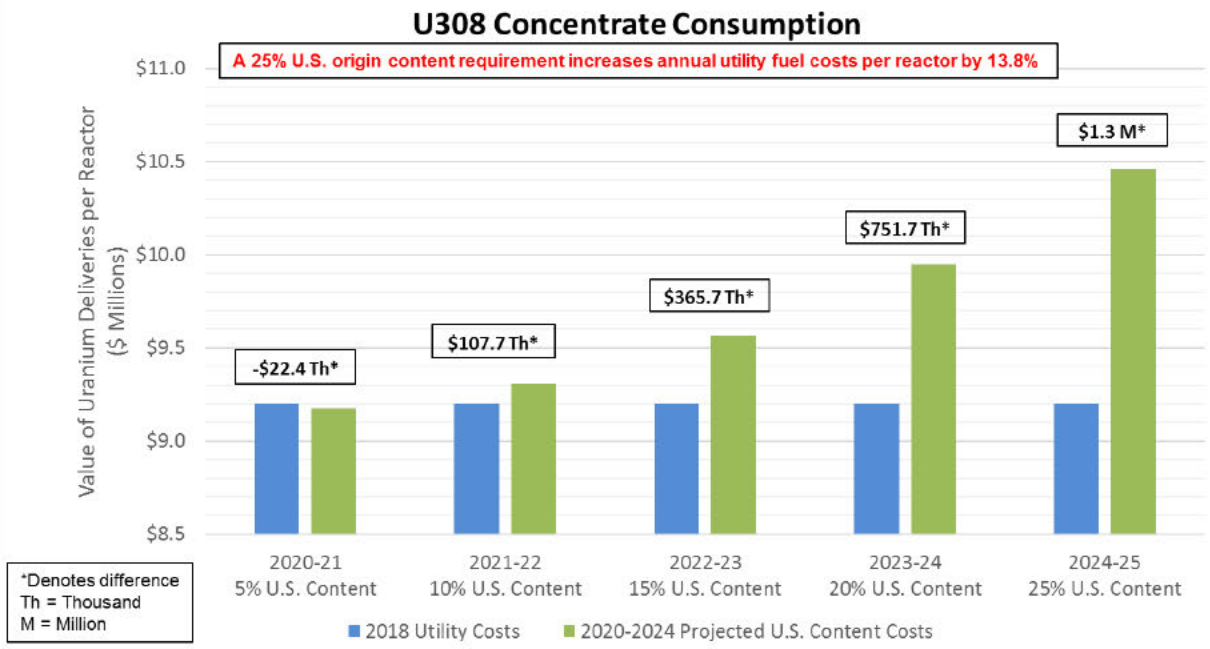
**This includes financial data for both utilities reporting at the company-wide level as well as nuclear-specific operating units. [redacted] were not included due to improperly submitted data.

Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q9B-Q

20 respondents

On a per-reactor basis, the 25 percent U.S.-origin requirement will increase fuel costs by approximately $1.3 million, or 13.76 percent, between 2020 and 2024. This calculation is based on overall fuel reactor costs of nearly $9.2 million per reactor in 2018 (*see* Figure 76).

Figure 76. U.S. Utility Per-Reactor Change in Projected Fuel Costs: Phased-In 25 Percent U.S. Origin Requirement, 2020-2024



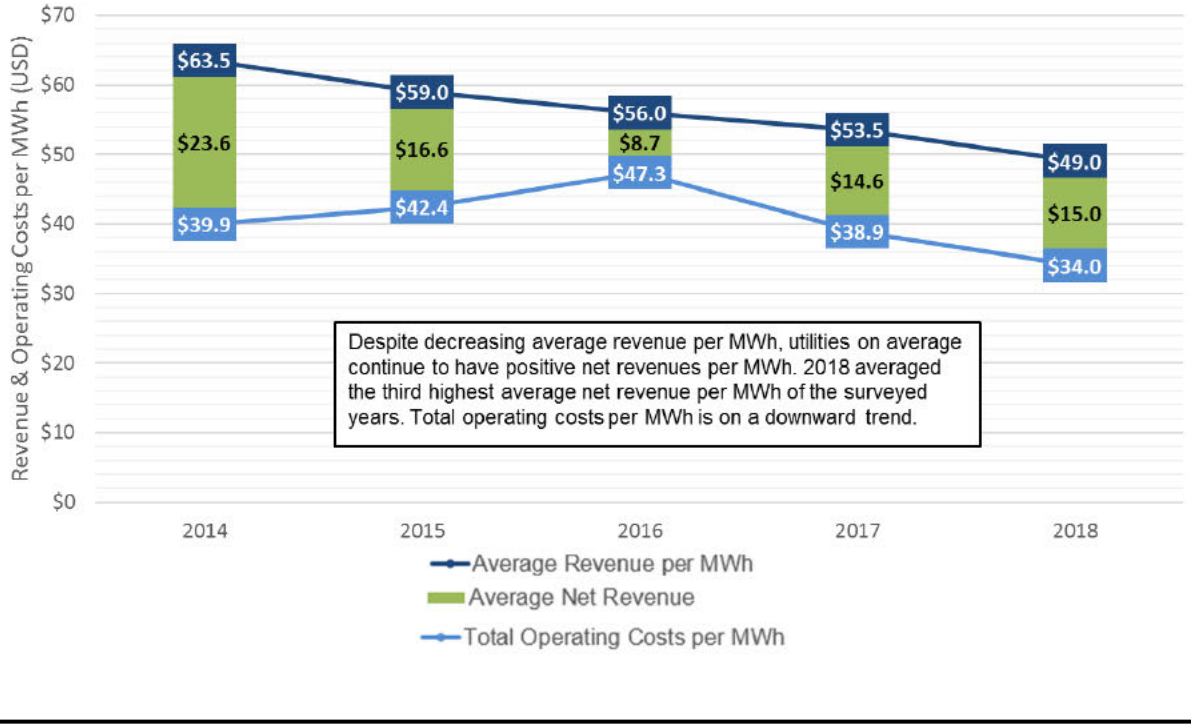
Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q9B-Q

* [redacted] were not included due to improperly submitted data.

*95 reactors**

On a per-megawatt hour (MWh) basis, the Department's data shows that U.S. nuclear electric utilities have experienced declining average net revenues since 2014. Between 2014 and 2016, average net revenues per MWh dropped from $23.60 to $15.00, a 36.4 percent decline. However, average net revenues have recovered since 2016. U.S. nuclear electric utilities reported an average per-MWh net revenue of $15.00 in 2018 (*see* Figure 77).

Figure 77. U.S. Utility Average Revenue and Operating Costs Per MWh, 2014-2018



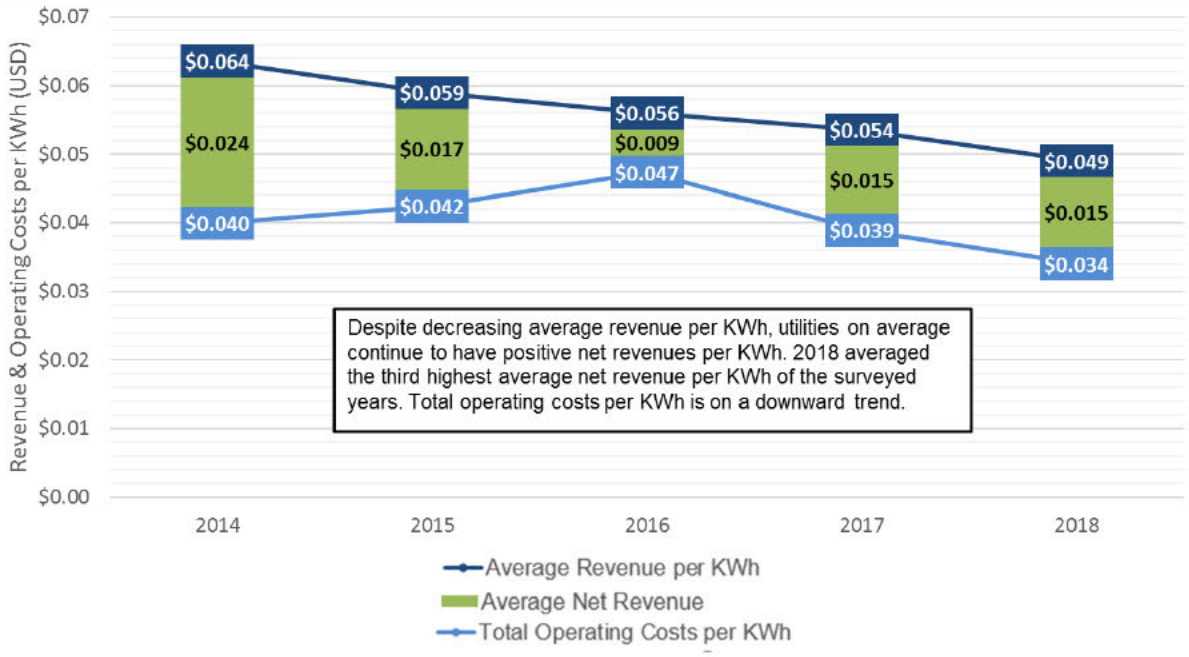
**Excludes [redacted]

Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q6C

20 respondents

A similar trend can be observed on a per kilowatt-hour (KWh) basis. U.S. utility per-KWh revenues fell from $0.024 in 2014 to just $0.009 in 2016 before increasing to $0.015 in 2018 (*see* Figure 78):

Figure 78. U.S. Utility Average Revenue and Operating Costs Per KWh, 2014-2018



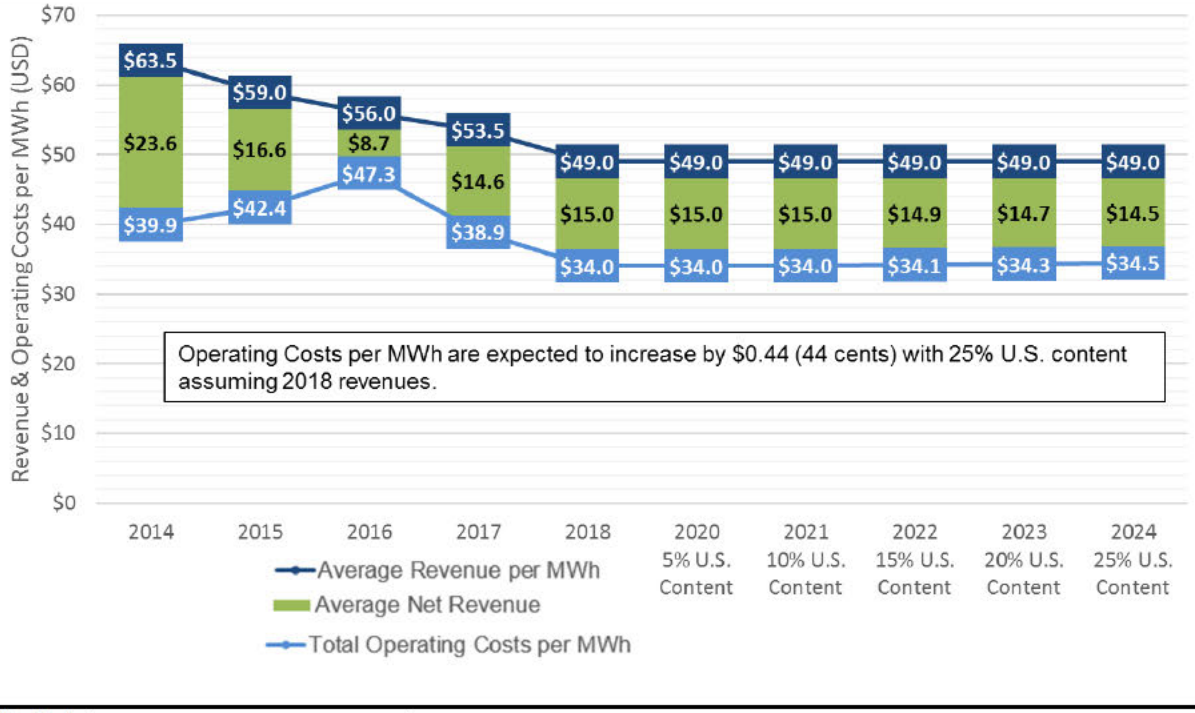
** [redacted]

Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q6C

20 respondents

The Department's analysis also projected the U.S.-origin requirement through 2024. The Department's analysis concludes that U.S. utility operating costs per MWh will increase to $34.45 in 2024, a small 1.29 percent increase over the projected 2020 cost of $34.01. U.S. utility average net revenues per MWh will drop slightly to $14.50, a marginal 3.4 percent decline compared to projected 2020 net revenues of $15.01 (*see* Figure 79).

Figure 79. U.S. Utility Average Revenue and Operating Costs Per MWh, 2014-2018 and Projections to 2024



**Excludes [redacted]

Source: U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generator Survey, Q6C

21 respondents

C. Public Policy Proposals

The Secretary finds that the effect of imported uranium on the national security can only be addressed through targeted Section 232 remedies. The Secretary has noted that the U.S. uranium industry and nuclear power generators face other non-trade challenges that hinder their ability to remain financially solvent and economically competitive.

These challenges, as discussed in Chapters VI and VII, include the premature shutdown of U.S. reactors, competition from natural gas-fired

generators, and subsidized renewable energy sources. In addition, the nuclear power industry is hindered by electricity market rules that do not consider nuclear energy's unique operational attributes. To address these issues, the Secretary advances the following public policy proposals for discussion which complement the Section 232 remedies identified in this investigation.[155]

1) Expansion of the American Assured Fuel Supply (AFS)

The Department of Energy maintains a reserve of enriched uranium for nuclear power generators known as the American Assured Fuel Supply (AFS), which is an emergency source of fuel for both U.S. and foreign nuclear power plants.[156] The AFS currently includes 230 metric tons of LEU, only enough material to reload six average nuclear reactors once (the U.S. has 98 reactors).[157] DOE should increase the AFS's inventory to 500 metric tons of LEU, enough to fuel 13 reactors in the U.S. and allied countries. This could supplement the [redacted] average inventory U.S. nuclear power utilities already maintain (*see* Figure

[155] Section V of the January 1989 Section 232 investigation into crude oil and refined petroleum imports contained several non-trade policy recommendations to be executed by Congress or other Federal departments. These recommendations included implementation of an oil and gas leasing plan, opening the Arctic National Wildlife Refuge to oil exploration, oil and gas licensing reform, and technical tax changes. U.S. Department of Commerce, Bureau of Export Administration; "The Effect of Crude Oil and Refined Petroleum Product Imports On The National Security"; January 1989.

[156] In 2005, the Department of Energy (DOE) announced that it would set aside 17.4 metric tons of highly-enriched uranium (HEU) for conversion to low-enriched uranium (LEU) that could be released to nuclear power generators in times of national emergency.

[157] *Notice of Availability: American Assured Fuel Supply*. *The Federal Register / FIND*. Vol. 76. Washington: Federal Information & News Dispatch, Inc., 2011. http://search.proquest.com/docview/884208970/.

66). The LEU procured for the AFS should come from newly mined, converted, and enriched U.S.-origin uranium.

2) Adoption of a Domestic Uranium Purchase Tax Credit

Congress should institute a tax credit for domestic uranium purchases for a five-year period. Under this proposal, U.S. nuclear power generators would receive a fixed dollar amount-per pound tax credit for purchasing uranium mined in the United States. The credit would be claimable in the tax year in which the nuclear power generator takes delivery of the material.

3) Continue the Moratorium on DOE Stockpile Sales

Under the Atomic Energy Act of 1954, the DOE possesses authority to sell or transfer its stockpiles to other parties.[158] DOE has used this authority to pay for cleanup efforts at the Portsmouth Gaseous Diffusion Facility. While DOE's determination process evaluates whether DOE transfers are having a material effect on the industry, respondents to the Department's 2019 uranium survey have reported that DOE's uranium transfer program has negatively impacted uranium producers' business. Congress should block further transfers of DOE stockpile material.

[158] U.S. Government Accountability Office. *Highlights of GAO-17-472T, a testimony before the Committee on Environment and Public Works, U.S. Senate*, 5. (Washington, DC: Mar. 8, 2017). https://www.gao.gov/assets/690/683764.pdf

4) State Adoption of Zero Emissions Credits

Implement zero emissions credits (ZEC) to compensate nuclear power generators for the value of the zero-emissions electricity that they produce. ZECs will help nuclear generators fairly compete against renewable sources such as solar and wind, which are subsidized through the federal production tax credit (PTC) and similar state subsidies. ZECs, if adopted by more states, may halt some current U.S. reactor retirements and solidify utility demand for U.S.-produced uranium.

5) Mandate that Federal Departments and Agencies Use Nuclear Power

The Federal government can support U.S. nuclear power generation by requiring Federal departments and agencies to purchase an average of 20 percent of their power from nuclear power plants for a period of five years at a fixed price. This would provide predictable demand for nuclear power generators.

6) Expand the Responsibilities of the Nuclear Materials Management and Safeguard Systems (NMMSS)

The 123 Agreements do not require tracking and reporting of "mining origin" data for nuclear material subject to peaceful use provisions. Furthermore, the domestic U.S. operators are not required to report origin data to NMMSS for imports, exports, and other nuclear material inventory changes.

NMMSS, as the national U.S. system of nuclear material accounting, can add the capability to track mining origin data. However, this outcome required changes impacting NRC regulations, 123 Agreements, and industry practices.

The Secretary recommends that the NRC and NNSA work with the Departments of Commerce, Defense, Energy, Homeland Security, and Justice to examine potential options and mechanisms to enable the reporting of origin data to NMMSS, and to coordinate with NMMSS to identify actions necessary for changes to the system.

Appendix A

UNITED STATES DEPARTMENT OF COMMERCE
The Secretary of Commerce
Washington, D.C. 20230

July 18, 2018

The Honorable James N. Mattis
Secretary of Defense
Washington, DC 20301-3010

Dear Mr. Secretary:

I am writing to notify you that I am initiating an investigation to determine the effects of imported uranium on national security. I am taking this action pursuant to Section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862). Section 232 authorizes the Secretary of Commerce to initiate such an investigation upon application of an interested party and requires notice to be provided to the Secretary of Defense upon initiation of an investigation.

During the course of the investigation, Department of Commerce staff will consult with their counterparts at the Department of Defense regarding any methodological and policy questions that may arise during the investigation. The investigation report will include information the Department of Defense can provide regarding the national defense requirements for uranium. I look forward to our collaboration on this important issue.

Our point of contact is Brad Botwin, Director, Industrial Studies, Office of Technology Evaluation, Bureau of Industry and Security. Mr. Botwin can be reached at Brad.Botwin@bis.doc.gov or (202) 482-4060.

Sincerely,

Wilbur Ross

Wilbur Ross

Appendix B

Regional Programs Unit at (213) 894–3437.

Records and documents discussed during the meeting will be available for public viewing prior to and after the meeting at *https://facadatabase.gov/committee/meetings.aspx?cid=234.* Please click on the ''Meeting Details'' and ''Documents'' links. Records generated from this meeting may also be inspected and reproduced at the Regional Programs Unit, as they become available, both before and after the meeting. Persons interested in the work of this Committee are directed to the Commission's website, *https://www.usccr.gov,* or may contact the Regional Programs Unit at the above email or street address.

Agenda:

I. Welcome
II. Presentations by Virgene Hanna and Jessica Passini
III. Public Comment
IV. Next Steps
V. Adjournment

Exceptional Circumstance: Pursuant to 41 CFR 102–3.150, the notice for this meeting is given less than 15 calendar days prior to the meeting because of the exceptional circumstance of staffing limitations that require immediate action.

Dated: July 20, 2018.

David Mussatt,

Supervisory Chief, Regional Programs Unit.

[FR Doc. 2018–15931 Filed 7–24–18; 8:45 am]

BILLING CODE P

DEPARTMENT OF COMMERCE

Economic Development Administration

Notice of Petitions by Firms for Determination of Eligibility To Apply for Trade Adjustment Assistance

AGENCY: Economic Development Administration, U.S. Department of Commerce.

ACTION: Notice and opportunity for public comment.

SUMMARY: The Economic Development Administration (EDA) has received petitions for certification of eligibility to apply for Trade Adjustment Assistance from the firms listed below. Accordingly, EDA has initiated investigations to determine whether increased imports into the United States of articles like or directly competitive with those produced by each of the firms contributed importantly to the total or partial separation of the firms' workers, or threat thereof, and to a decrease in sales or production of each petitioning firm.

SUPPLEMENTARY INFORMATION:

LIST OF PETITIONS RECEIVED BY EDA FOR CERTIFICATION OF ELIGIBILITY TO APPLY FOR TRADE ADJUSTMENT ASSISTANCE

[07/11/2018 through 07/17/2018]

Firm name	Firm address	Date accepted for investigation	Product(s)
Mectron Engineering Company, Inc..	400 South Industrial Drive, Saline, MI 48176.	7/13/2018	The firm manufactures high-speed industrial inspection machinery.
Seidel, LLC	2223 Thomaston Avenue, Waterbury, CT 06704.	7/13/2018	The firm provides aluminum anodizing finishes for various industries and applications.
Meyer Wells, Inc.	421 3rd Avenue West, Seattle, WA 98119.	7/17/2018	The firm manufactures commercial and residential furniture, mostly made of reclaimed wood.

Any party having a substantial interest in these proceedings may request a public hearing on the matter. A written request for a hearing must be submitted to the Trade Adjustment Assistance Division, Room 71030, Economic Development Administration, U.S. Department of Commerce, Washington, DC 20230, no later than ten (10) calendar days following publication of this notice. These petitions are received pursuant to section 251 of the Trade Act of 1974, as amended.

Please follow the requirements set forth in EDA's regulations at 13 CFR 315.9 for procedures to request a public hearing. The Catalog of Federal Domestic Assistance official number and title for the program under which these petitions are submitted is 11.313, Trade Adjustment Assistance for Firms.

Irette Patterson,

Program Analyst.

[FR Doc. 2018–15850 Filed 7–24–18; 8:45 am]

BILLING CODE 3510–WH–P

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Uranium

AGENCY: Bureau of Industry and Security, Office of Technology Evaluation, U.S. Department of Commerce.

ACTION: Notice of request for public comments.

SUMMARY: The Secretary of Commerce has initiated an investigation to determine the effects on the national security of imports of uranium. This investigation has been initiated under section 232 of the Trade Expansion Act of 1962, as amended.

Interested parties are invited to submit written comments, data, analyses, or other information pertinent to the investigation to the Department of Commerce's Bureau of Industry and Security. This notice identifies issues on which the Department is especially interested in obtaining the public's views.

DATES: Comments may be submitted at any time but must be received by September 10, 2018.

ADDRESSES: All written comments on the notice must be submitted by one of the following methods:

- *By the Federal eRulemaking Portal: http://www.regulations.gov.* Comments on this notice may be submitted to *regulations.gov* docket number BIS–2018–0011.
- By mail or delivery to Michael Vaccaro, Acting Director, Office of Technology Evaluation, Bureau of Industry and Security, U.S. Department of Commerce, 1401 Constitution Avenue NW, Room 1093, Washington, DC 20230.
- By email directly to *Uranium232@bis.doc.gov.*

FOR FURTHER INFORMATION CONTACT: Michael Vaccaro, Acting Director, Office of Technology Evaluation, Bureau of Industry and Security, U.S. Department of Commerce (202) 482–4060, *Uranium232@bis.doc.gov.* For more information about the section 232 program, including the regulations and the text of previous investigations, see *www.bis.doc.gov/232.*

SUPPLEMENTARY INFORMATION:

Background

On July 18, 2018, the Secretary of Commerce (''Secretary'') initiated an investigation under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862), to determine the effects on the national security of imports of uranium.

Written Comments

This investigation is being undertaken in accordance with part 705 of the National Security Industrial Base Regulations (15 CFR parts 700 to 709) (''NSIBR''). Interested parties are invited to submit written comments, data, analyses, or information pertinent to this investigation to the Office of Technology Evaluation, U.S. Department of Commerce (''the Department''), no later than September 10, 2018.

The Department is particularly interested in comments and information directed to the criteria listed in § 705.4 of the regulations as they affect national security, including the following: (a) Quantity of or other circumstances related to the importation of uranium; (b) Domestic production and productive capacity needed for uranium to meet projected national defense requirements; (c) Existing and anticipated availability of human resources, products, raw materials, production equipment, and facilities to produce uranium; (d) Growth requirements of the uranium industry to meet national defense requirements and/or requirements to assure such growth; (e) The impact of foreign competition on the economic welfare of the uranium industry; (f) The displacement of any domestic uranium production causing substantial unemployment, decrease in the revenues of government, loss of investment or specialized skills and productive capacity, or other serious effects; (g) Relevant factors that are causing or will cause a weakening of our national economy; and (h) Any other relevant factors.

Material submitted by members of the public that is business confidential information will be exempted from public disclosure as provided for by § 705.6 of the regulations. Anyone submitting business confidential information should clearly identify the business confidential portion of the submission, file a statement justifying nondisclosure and referring to the specific legal authority claimed, and provide a non-confidential submission which can be placed in the public file. Communications from agencies of the United States Government will not be made available for public inspection. If public hearings are held in support of this investigation, a separate **Federal Register** notice will be published.

The Bureau of Industry and Security does not maintain a separate public inspection facility. Requesters should first view the Bureau's web page, which can be found at *https://efoia.bis.doc.gov/* (see ''Electronic FOIA'' heading). If requesters cannot access the website, they may call 202–482–0795 for assistance. The records related to this assessment are made accessible in accordance with the regulations published in part 4 of title 15 of the Code of Federal Regulations (15 CFR 4.1 *et seq.*).

Dated: July 19, 2018.

Wilbur Ross,

Secretary of Commerce.

[FR Doc. 2018–15891 Filed 7–24–18; 8:45 am]

BILLING CODE 3510–33–P

DEPARTMENT OF COMMERCE

International Trade Administration

[A–570–814]

Carbon Steel Butt-Weld Pipe Fittings From the People's Republic of China: Preliminary Affirmative Determination of Circumvention of the Antidumping Duty Order

AGENCY: Enforcement and Compliance, International Trade Administration, Department of Commerce.

SUMMARY: The Department of Commerce (Commerce) preliminarily determines that carbon steel butt-weld pipe fittings (butt-weld pipe fittings) exported from Malaysia, which were completed in Malaysia using finished or unfinished butt-weld pipe fittings sourced from the People's Republic of China (China), are circumventing the antidumping duty (AD) order on butt-weld pipe fittings from China.

DATES: Applicable July 25, 2018.

FOR FURTHER INFORMATION CONTACT: Jerry Huang or Susan Pulongbarit, AD/CVD Operations, Office V, Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230; telephone: (202) 482–4047 or (202) 482–4031, respectively.

SUPPLEMENTARY INFORMATION:

Background

On July 6, 1992, Commerce issued the AD order on imports of butt-weld pipe fittings from China.[1] Additionally, on March 31, 1994, Commerce issued an affirmative final anti-circumvention determination finding that imports into the United States of pipe fittings that were finished in Thailand from unfinished pipe fittings produced in China constituted circumvention of the *Order* within the meaning of section 781(b) of the Tariff Act of 1930, as amended (the Act).[2] Commerce applied this finding of circumvention to all imports of butt-weld pipe fittings from Thailand, regardless of manufacturer/producer, unless accompanied by a certification stating that such pipe fittings have not been produced from unfinished pipe fittings sourced from China.[3]

On May 22, 2017, Tube Forgings of America, Inc., Mills Iron Works, Inc., and Hackney Ladish, Inc., (collectively, the domestic parties), alleged that imports of butt-weld pipe fittings which were completed in Malaysia using finished or unfinished butt-weld pipe fittings sourced from China are circumventing the *Order.*[4] In their allegation, the domestic parties requested that Commerce initiate an anti-circumvention inquiry pursuant to section 781(b) of the Act, and 19 CFR 351.225(h), to determine whether imports of butt-weld pipe fittings sourced from unfinished or finished butt-weld pipe fittings from the PRC have undergone minor finishing processes, or were simply marked with ''Malaysia'' as the country of origin, in Malaysia, before export to the United States constitutes circumvention of the *Order.* The domestic parties also requested that Commerce reach an affirmative determination of circumvention for all imports of butt-

[1] *See Antidumping Duty Order and Amendment to the Final Determination of Sales at Less Than Fair Value; Certain Carbon Steel Butt-Weld Pipe Fittings from the People's Republic of China,* 57 FR 29702 (July 6, 1992) (*Order*).

[2] *See Certain Carbon Steel Butt-Weld Pipe Fittings from the People's Republic of China; Affirmative Final Determination of Circumvention of Antidumping Duty Order,* 59 FR 15155 (March 31, 1994).

[3] *Id.,* at 15158–59.

[4] *See* Letter from the domestic parties to the Secretary of Commerce, ''Carbon Steel Butt-Weld Pipe Fittings from the People's Republic of China, A–570–814; Request for Circumvention Ruling Pursuant to Section 781(b) of the Tariff Act of 1930,'' dated May 22, 2017.

email address prior to placing callers into the conference room. Callers can expect to incur regular charges for calls they initiate over wireless lines, according to their wireless plan. The Commission will not refund any incurred charges. Callers will incur no charge for calls they initiate over land-line connections to the toll-free telephone number. Persons with hearing impairments may also follow the proceedings by first calling the Federal Relay Service at 1–800–877–8339 and providing the Service with the conference call number and conference ID number.

Members of the public are also entitled to submit written comments; the comments must be received in the regional office within 30 days following the meeting. Written comments may be mailed to the Midwestern Regional Office, U.S. Commission on Civil Rights, 230 S Dearborn St., Suite 2120, Chicago, IL 60604. They may also be faxed to the Commission at (312) 353–8324, or emailed to Carolyn Allen at *callen@usccr.gov.* Persons who desire additional information may contact the Midwestern Regional Office at (312) 353–8311.

Records generated from this meeting may be inspected and reproduced at the Midwestern Regional Office, as they become available, both before and after the meeting. Records of the meeting will be available via *www.facadatabase.gov* under the Commission on Civil Rights, Michigan Advisory Committee link (*http://www.facadatabase.gov/committee/meetings.aspx?cid=255*). Persons interested in the work of this Committee are directed to the Commission's website, *http://www.usccr.gov,* or may contact the Midwestern Regional Office at the above email or street address.

Agenda

Welcome and Introductions
Discussion: Civil Rights in Michigan: Voting Rights
Public Comment
Future Plans and Actions
Adjournment

Dated: September 4, 2018.

David Mussatt,

Supervisory Chief, Regional Programs Unit.

[FR Doc. 2018–19503 Filed 9–7–18; 8:45 am]

BILLING CODE 6335–01–P

DEPARTMENT OF COMMERCE

Submission for OMB Review; Comment Request

The Department of Commerce will submit to the Office of Management and Budget (OMB) for clearance the following proposal for collection of information under the provisions of the Paperwork Reduction Act (44 U.S.C. Chapter 35).

Agency: National Institute of Standards and Technology, Commerce.

Title: Analysis of Exoskeleton-Use for Enhancing Human Performance Data Collection.

OMB Control Number: 0693–XXXX.

Form Number(s): None (new submission).

Type of Request: Regular.

Number of Respondents: 180.

Average Hours per Response: 10 minutes.

Burden Hours: 30 hours.

Needs and Uses: NIST's Engineering Laboratory will be developing methods to evaluate performance of exoskeletons in two key areas (1) The fit and motion of the exoskeleton device with respect to the users' body and (2) The impact that using an exoskeleton has on the performance of users executing tasks that are representative of activities in industrial settings. The results of these experiments will inform future test method development at NIST, other organizations, and under the purview of the new American Society for Testing Materials (ASTM) Committee F48 on Exoskeletons and Exosuits.

Affected Public: Individuals participating in the study.

Frequency: On occasion.

Respondent's Obligation: Voluntary.

This information collection request may be viewed at *reginfo.gov.* Follow the instructions to view Department of Commerce collections currently under review by OMB.

Written comments and recommendations for the proposed information collection should be sent within 30 days of publication of this notice to *OIRA_Submission@omb.eop.gov* or fax to (202) 395–5806.

Sheleen Dumas,

Departmental Lead PRA Officer, Office of the Chief Information Officer.

[FR Doc. 2018–19504 Filed 9–7–18; 8:45 am]

BILLING CODE 3510–13–P

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

Change in Comment Deadline for Section 232 National Security Investigation of Imports of Uranium

AGENCY: Bureau of Industry and Security, Office of Technology Evaluation, U.S. Department of Commerce.

ACTION: Notice on change in comment period for previously published notice of request for public comments.

SUMMARY: On July 25, 2018, the Bureau of Industry and Security (BIS) published the Notice of Inquiry for Public Comments on Section 232 National Security Investigation of Imports of Uranium. The July 25 notice specified that the Secretary of Commerce initiated an investigation to determine the effects on the national security of imports of uranium. This investigation has been initiated under section 232 of the Trade Expansion Act of 1962, as amended. The July 25 notice invited interested parties to submit written comments, data, analyses, or other information pertinent to the investigation to the Department of Commerce's Bureau of Industry and Security. The deadline for the written comments was September 10, 2018. Today's notice changes the comment deadline to September 25, 2018.

DATES: Comments may be submitted at any time but must be received by September 25, 2018.

ADDRESSES: All written comments on the notice must be submitted by one of the following methods:

- *By the Federal eRulemaking Portal: http://www.regulations.gov.* Comments on this notice may be submitted to *regulations.gov* docket number BIS–2018–0011.
- By mail or delivery to Michael Vaccaro, Acting Director, Office of Technology Evaluation, Bureau of Industry and Security, U.S. Department of Commerce, 1401 Constitution Avenue NW, Room 1093, Washington, DC 20230.
- By email directly to *Uranium232@bis.doc.gov.*

FOR FURTHER INFORMATION CONTACT: Michael Vaccaro, Acting Director, Office of Technology Evaluation, Bureau of Industry and Security, U.S. Department of Commerce (202) 482–4506, *Uranium232@bis.doc.gov.* For more information about the section 232 program, including the regulations and the text of previous investigations, see *www.bis.doc.gov/232.*

SUPPLEMENTARY INFORMATION:

Background

On July 25, 2018, (83 FR 35204), the Bureau of Industry and Security (BIS) published the *Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Uranium.* The July 25 notice specified that on July 18, 2018, the Secretary of Commerce had initiated an investigation to determine the effects on

the national security of imports of uranium. This investigation was initiated under section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. 1862). (*See* the July 25 notice for additional details on the investigation and the request for public comments.)

Change in Comment Period Deadline

The July 25 notice included a comment period deadline of September 10, 2018. The Department received three requests from the public to extend the comment period deadline, including one request from a trade association. The Department of Commerce has determined at this time that it is warranted to extend the comment period by fifteen calendar days. Today's notice specifies that comments may be submitted at any time but must be received by September 25, 2018, to be considered in the drafting of the final report. Today's notice extends the comment period by fifteen days to allow for additional time for the public to submit comments on the investigation of imports of uranium.

Dated: September 5, 2018.

Richard E. Ashooh,

Assistant Secretary for Export Administration.

[FR Doc. 2018–19651 Filed 9–7–18; 8:45 am]

BILLING CODE 3510–33–P

DEPARTMENT OF COMMERCE

International Trade Administration

Initiation of Antidumping and Countervailing Duty Administrative Reviews

AGENCY: Enforcement and Compliance, International Trade Administration, Department of Commerce.

SUMMARY: The Department of Commerce (Commerce) has received requests to conduct administrative reviews of various antidumping and countervailing duty orders and findings with July anniversary dates. In accordance with Commerce's regulations, we are initiating those administrative reviews.

DATES: Applicable September 10, 2018.

FOR FURTHER INFORMATION CONTACT: Brenda E. Brown, Office of AD/CVD Operations, Customs Liaison Unit, Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230, telephone: (202) 482–4735.

SUPPLEMENTARY INFORMATION:

Background

Commerce has received timely requests, in accordance with 19 CFR 351.213(b), for administrative reviews of various antidumping and countervailing duty orders and findings with July anniversary dates.

All deadlines for the submission of various types of information, certifications, or comments or actions by Commerce discussed below refer to the number of calendar days from the applicable starting time.

Notice of No Sales

If a producer or exporter named in this notice of initiation had no exports, sales, or entries during the period of review (POR), it must notify Commerce within 30 days of publication of this notice in the **Federal Register**. All submissions must be filed electronically at *http://access.trade.gov* in accordance with 19 CFR 351.303.[1] Such submissions are subject to verification in accordance with section 782(i) of the Tariff Act of 1930, as amended (the Act). Further, in accordance with 19 CFR 351.303(f)(1)(i), a copy must be served on every party on Commerce's service list.

Respondent Selection

In the event Commerce limits the number of respondents for individual examination for administrative reviews initiated pursuant to requests made for the orders identified below, Commerce intends to select respondents based on U.S. Customs and Border Protection (CBP) data for U.S. imports during the period of review. We intend to place the CBP data on the record within five days of publication of the initiation notice and to make our decision regarding respondent selection within 30 days of publication of the initiation **Federal Register** notice. Comments regarding the CBP data and respondent selection should be submitted seven days after the placement of the CBP data on the record of this review. Parties wishing to submit rebuttal comments should submit those comments five days after the deadline for the initial comments.

In the event Commerce decides it is necessary to limit individual examination of respondents and conduct respondent selection under section 777A(c)(2) of the Act:

In general, Commerce has found that determinations concerning whether particular companies should be ''collapsed'' (*e.g.,* treated as a single entity for purposes of calculating antidumping duty rates) require a substantial amount of detailed information and analysis, which often require follow-up questions and analysis. Accordingly, Commerce will not conduct collapsing analyses at the respondent selection phase of this review and will not collapse companies at the respondent selection phase unless there has been a determination to collapse certain companies in a previous segment of this antidumping proceeding (*e.g.,* investigation, administrative review, new shipper review or changed circumstances review). For any company subject to this review, if Commerce determined, or continued to treat, that company as collapsed with others, Commerce will assume that such companies continue to operate in the same manner and will collapse them for respondent selection purposes. Otherwise, Commerce will not collapse companies for purposes of respondent selection. Parties are requested to (a) identify which companies subject to review previously were collapsed, and (b) provide a citation to the proceeding in which they were collapsed. Further, if companies are requested to complete the Quantity and Value (Q&V) Questionnaire for purposes of respondent selection, in general each company must report volume and value data separately for itself. Parties should not include data for any other party, even if they believe they should be treated as a single entity with that other party. If a company was collapsed with another company or companies in the most recently completed segment of this proceeding where Commerce considered collapsing that entity, complete Q&V data for that collapsed entity must be submitted.

Deadline for Withdrawal of Request for Administrative Review

Pursuant to 19 CFR 351.213(d)(1), a party that has requested a review may withdraw that request within 90 days of the date of publication of the notice of initiation of the requested review. The regulation provides that Commerce may extend this time if it is reasonable to do so. Determinations by Commerce to extend the 90-day deadline will be made on a case-by-case basis.

Separate Rates

In proceedings involving non-market economy (NME) countries, Commerce begins with a rebuttable presumption that all companies within the country are subject to government control and, thus, should be assigned a single antidumping duty deposit rate. It is Commerce's policy to assign all exporters of merchandise subject to an administrative review in an NME country this single rate unless an exporter can demonstrate that it is

[1] *See Antidumping and Countervailing Duty Proceedings: Electronic Filing Procedures; Administrative Protective Order Procedures,* 76 FR 39263 (July 6, 2011).

Appendix C

THE EFFECT OF THE IMPORTS OF URANIUM ON THE NATIONAL SECURITY

U.S. Department of Commerce
Bureau of Industry and Security
Office of Technology Evaluation

Public Comments

March 11, 2019

Table of Contents

Core Constituents…….Tab 1

General Public……. Tab 2

American Exploration and Mining Association

The American Exploration & Mining Association (AEMA) fully supports actions taken to address the issues raised during the Department's Uranium 232 investigation. AEMA represents over 2000 members in 42 states, 7 Canadian provinces or territories, and 10 other countries, all of whom are interested in protecting and promoting the mining industry. They have seen firsthand the damage done by government regulation and especially hostile market practices by state-owned enterprises.

In 2017, U.S. uranium production fell to near historic lows due in large part to uranium and nuclear fuel imported from state-subsidized foreign entities, and in 2018 U.S. producers may have produced less than 2% of our nation's needs. Uranium is essential to our national defense, including providing fuel for the U.S. Navy and representing the backbone of our nuclear deterrent, and yet over the past decade this key domestic industry has shrunk to the point that U.S. national security is now threatened. State-owned enterprises in Russia, Kazakhstan, and Uzbekistan are targeting the U.S. uranium industry, currently fulfilling over one-third of U.S. demand. Moreover, Chinese state-owned entities have announced plans to penetrate the U.S. nuclear market, threatening to further degrading U.S. energy security and national security. At the same time, traditional allies like Canada and Australia, mines are shutting down and reducing production because of similar unfair trade practices.

The U.S. uranium mining industry can compete on a level-playing field with anyone. However, the anticompetitive practices of state-owned and state-subsidized entities are putting U.S. producers at an enormous disadvantage. To combat this threat to the national security, the AEMA supports a 25% quota reserving market share for domestic uranium, as well as a "Buy American" policy for all U.S. Government purchases. While these actions will have an impact on rival foreign entities, they will have very little impact on U.S. utilities and their customers. Without prompt action on this front, uranium imports from Russia, China, and other geopolitical rivals will increase significantly in the future, and further imperil the national security of the United States.

Arizona Mining Association

The Arizona Mining Association (AMA) is in full support of taking actions through the Department's Uranium 232 investigation. As an organization designed to promote the mining industry, it has seen firsthand the loss of jobs and production in uranium mines throughout the state.

In 2017, U.S. uranium production fell to near historic lows due in large part to uranium and nuclear fuel imported from state-subsidized foreign entities, and in 2018 U.S. producers may have produced less than 2% of our nation's needs. Uranium is essential to our national defense, including providing fuel for the U.S. Navy and representing the backbone of our nuclear deterrent, and yet over the past decade this key domestic industry has shrunk to the point that U.S. national security is now threatened. State-owned enterprises in Russia, Kazakhstan, and Uzbekistan are targeting the U.S. uranium industry, currently fulfilling over one-third of U.S. demand. Moreover, Chinese state-owned entities have announced plans to penetrate the U.S. nuclear market, threatening to further degrading U.S. energy security and national security. At the same time, traditional allies like Canada and Australia, mines are shutting down and reducing production because of similar unfair trade practices.

The U.S. uranium mining industry can compete on a level-playing field with anyone. However, the anticompetitive practices of state-owned and state-subsidized entities are putting U.S. producers at an enormous disadvantage. To combat this threat to the national security, the AMA supports a 25% quota reserving market share for domestic uranium, as well as a "Buy American" policy for all U.S. Government purchases. While these actions will have an impact on rival foreign entities, they will have very little impact on U.S. utilities and their customers. Without prompt action on this front, uranium imports from Russia, China, and other geopolitical rivals will increase significantly in the future, and further imperil the national security of the United States.

Australian Government

The Australian Government supports the Department's Section 232 investigation into Uranium imports, but opposes any action taken as a result of said investigation that would harm the bilateral trade relationship between the United States and Australia. Australia supplies uranium to the United States exclusively for peaceful, non-military purposes. This supply of Australian uranium supports the U.S. uranium processing industry, complementing the investments between Australia and the United States that strengthen their respective uranium industries.

Australia is the world's third-largest producer of uranium ore and has the world's largest uranium reserves (approximately 30 per cent of the world's known reserves). Unlike other major producers of uranium, Australia does not have a downstream uranium processing industry and does not use nuclear power for electricity generation. All uranium mined in Australia is exported as uranium ore concentrate, which undergoes further processing abroad prior to use in civilian nuclear power reactors. In 2017, Australia exported a total of 16,155 thousand pounds (7,343 tons) of uranium ore concentrate, with more than a third sent directly to the United States. A significant portion of Australian uranium purchased by U.S. power utilities also enters the United States after undergoing processing in Canada or Europe. In total, the United States accounts for approximately 60 per cent of the final demand for Australian uranium.

There are significant bilateral investment ties between the Australian and U.S. uranium industries. For example, Peninsula Energy Limited, a public company listed on the Australian Securities Exchange, wholly owns Strata Energy, Inc., the operator of the Lance Project in Wyoming. As of 30 June 2017, the Lance Project directly employed 38 full time staff in addition to contracting drilling and geophysical personnel, making it a significant employer in the U.S. uranium mining industry. Another Australian company, Silex Systems Limited, has invested US$400 million over the past 20 years, in conjunction with U.S. and Canadian partners, to develop a unique laser enrichment technology, contributing to U.S. nuclear innovation.

The United States – Australia alliance has been the foundation of this bilateral security cooperation for 67 years. The alliance is characterized by cultural affinity and robust bilateral arrangements, spanning foreign policy, defense and security, intelligence, development, energy, environment, education, law, trade and investment. The Australia-United States Free Trade Agreement (AUSFTA) underpins the close economic relationship. In April 2017, Vice President Pence described AUSFTA as a "model for a mutually beneficial trade agreement and a model for the world". Since AUSFTA's entry into force in 2005, bilateral trade has grown from A$42 billion to A$68.5 billion in 2017, and two-way investment has grown by over 140 percent to A$1.6 trillion. The United States enjoys 100 percent tariff-free and quota-free access to Australia.

To this end, the Government of Australia supports the United States in their 232 investigation of uranium imports. However, Australia is not a threat to U.S. national security, but rather an ally to it, providing necessary uranium and strategic partnership. With this in mind, any action taken as a result of the 232 investigation should avoid harming such an important trade relationship.

[redacted]

Cameco Corporation

Cameco Corporation expresses its support for the DOC's Section 232 investigation into the effects of uranium imports on national security, however, is not in agreement with the purposed solutions and possible implications from the investigation.

Cameco is the largest publicly traded uranium producer in the world and, of the world's six largest uranium producers it is the only one that is not a state-owned entity. Cameco accounted for 16 percent of global uranium production in 2017. Its operations are principally in North America, 7 with approximately 90 percent of its uranium production capacity located in the U.S. Cameco supports free and fair trade, including reciprocal market access for trade and investment in countries that produce and consume uranium. Cameco is a longtime participant in the civilian nuclear energy industry, and will remain a key supplier of uranium concentrates and conversion services to the U.S. and its allies for many years to come. Cameco stands ready to work with the U.S. government and industry colleagues to ensure the long-term viability of U.S. uranium supply.

Cameco recognizes the weak market conditions identified by Petitioners, but does not agree with specific quota proposals because they are too broad, would restrict Canadian imports, and are unrealistic in their estimate of feasible U.S. production levels. Cameco could, however, support a Buy American requirement for U.S. government purchases, and Cameco does support an extension of the Russian Suspension Agreement in some form and the adoption of clear and concise rules on U.S. government sales of excess uranium inventory until the domestic market is strong enough to absorb such volumes. Cameco holds that the current market issues are caused by "the ongoing world oversupply of uranium products, combined with declining demand, (which) have led to a steady fall in prices for uranium concentrates, conversion and enrichment since 2011." While Cameco shares Petitioners' concerns about the sustainability of current market prices, it believes that the domestic consumption quota would be difficult to implement, would be harmful to responsible participants in the U.S. nuclear industry, and could result in increased dependence on state-owned uranium producers, which would undermine any effort to increase national security

Additionally, quotas are not a viable option because it would take years to ramp up curtailed and nascent annual production from one million to 12 million pounds that imports provide. The remedies proposed in the petition also fail to consider that U.S. utilities must have uranium contracted significantly in advance in order to ensure reliable energy supplies to their customers. This means that there is currently little near-term open demand. Yet Petitioners' proposed import quota for the remaining 75 percent of consumption fails to distinguish between imports from SOEs and fairly traded imports from commercial actors in countries that are U.S. allies and dependable trading partners

If a quota is implemented, Cameco respectfully submits that (1) there should be no domestic purchasing requirement; (2) under no circumstances should Cameco's imports of Canadian

origin uranium be subject to an import quota; and (3) any import quotas should be imposed only on some or all imports from the four named countries with state-owned or controlled enterprises (SOEs). Moreover, any SOE import quotas should potentially include a market pricing mechanism and otherwise be modeled after the Russian Suspension Agreement. Similarly, Tariffs should not be considered as an appropriate or effective remedy because they may be prohibitively high for U.S. utilities and could be "absorbed" or counteracted by SOEs, thus negating their benefit to U.S. miners.

The Campbell County Board of Commissioners - Wyoming

The Campbell County Board of Commissioners (Wyoming) expresses its support for the DOC's Section 232 investigation of the effect foreign uranium imports have on U.S. national security. They cite "anti-competitive practices of state-owned and state-subsidized entities, many of which are in undemocratic countries" as the cause for the rapid decline of domestically produced uranium.

Campbell County, Wyoming is home to vast natural resources essential to meeting the nation's energy needs, including significant deposits of coal, oil, natural gas, coal bed methane and uranium. The mission of Campbell County is to provide quality, efficient, and cost-effective services for all Campbell County residents through sound decision making and fiscal responsibility. They strongly support the continued development of uranium extraction within our region. Wyoming is home to more than fifty percent (50%) of all uranium production in the U.S. However, Campbell County, production has decreased by over seventy five percent (75%) from 2015 to 2018. Proposals put forth in the investigation would create jobs and protect national security interests.

The anti-competitive practices of state-owned and state-subsidized entities put the U.S. uranium industry at a huge disadvantage. This is a threat to national security because the U.S. cannot afford to be have its energy and national security controlled by external interests. The United States Uranium Industry has ample capacity to fulfill all our domestic production requirements now and in the future. Through import restrictions the U.S. could preserve jobs and create employment opportunities in the well-paying in the uranium industry. Therefore, the Campbell County Board of Commissioners urge to expedite the security investigation and institute remedies which are sensible and achievable with the domestic uranium mining industry.

Carbon County, Wyoming

The Carbon County Commissioners voice their full support for the Department's Section 232 investigation into uranium imports and remedies that may be put into action from the investigation. What was once a healthy industry with several thousand employees, Wyoming's uranium sector has dwindled to only 245 employees and is continuously declining.

A healthy uranium industry is important in Wyoming for many reasons. One of the petitioners, UR-Energy USA, Inc., is a junior uranium mining company operating the Lost Creek in-situ recovery uranium facility in south-central Wyoming and therefor the views put forth by the Petitioners are reflective of those of the Carbon County Commissioners. A vital uranium industry would signify the return of the many lost jobs and the assurance of our U.S. national security. Additionally, it would pay millions of dollars in severance and ad valorem taxes annually, which would help diversify their economy and tax base. By implementing the remedies put forth by Petitioners, uranium-mining communities all around the U.S. would experience the benefits anticipated by Carbon County, Wyoming.

Currently, Wyoming has six existing uranium mines that could restart or increase production and at least five new mines that could be brought online in a relatively short time period. If action is not taken, these mines will not reach their full potential. Given that the uranium used in national defense programs is required to be of original U.S. content, reviving these industries is crucial to our national security.

Wyoming's uranium industry is threatened by the import of non-domestic uranium from nations such as Russia and China that are antagonistic to our democratic values and mine uranium under weak to non-existent environmental regulations. Domestic miners currently provide less than 2% of our nation's uranium demand and this poses a threat not just to the local economies, but also to our national security.

Centrus Energy Corporation and United States Enrichment Corporation

Centrus Energy Corporation and United States Enrichment Corporation express their support of the DOC's Section 232 investigation into the effects of uranium imports on national security. However, their support does not extend to the purposed solutions put forth and are wary of the potential negative impacts these solutions may have. Centrus Energy Corp. and the U.S. Enrichment Corp. recognize the decline in U.S. nuclear fuel production. The 232 uranium Petition addresses the decline of the first stage of the fuel cycle: uranium mining. While uranium mining has decreased in the U.S. the decline in the second and third stage of the fuel cycle – conversion and enrichment – is where the greater threat to national security lies. These stages are costly and technology intensive and Centrus has had to close two of its plants as the U.S. enrichment facilities cannot stay competitive globally. The market for U.S. enrichment must be revitalized in order to maintain national security since foreign mined, converted, and enriched uranium cannot be used for U.S. national defense purposes.

However, the purposed quotas or other import restrictions will not restore all the steps needed to produce uranium for defense purposes. In fact, the quotas suggested by the Petitioners could be counterproductive and actually undermine the companies, capabilities, and technologies America needs to meet its national security requirements. Therefore, Centrus recommends that, in this proceeding, the Department should decline to recommend quotas or other trade measures, and instead recommend non-trade measures to protect U.S. national security.

Quotas or other import restrictions are damaging because Centrus would lose its ability to use the revenues generated by sales of SWU that it needs to continue pursuing its current level of activity to support U.S. national security requirements. Sales of uranium and SWU currently account for ~90% of our total revenues. If the quotas or import restrictions raise the price of uranium products needed by U.S. utilities to fuel their reactors, they could lead to additional premature reactor shutdowns at the expense of U.S. energy security. Imported uranium products – including foreign conversion and enrichment – have helped to maintain reliability and reduce fuel costs for U.S. nuclear reactors, which supply 20% of America's electricity. From that perspective, imports actually enhance, rather than threaten, U.S. energy security, and it is therefore important to U.S. energy security that nuclear plant operators are not forced to curtail their energy production or accelerate nuclear reactor shutdowns due to blanket import restrictions that limit fuel accessibility and supply diversity.

Measures other than trade restrictions would better serve to address any threats to national security identified in this investigation. Such non-trade measures could include procurement policies that focus on unobligated uranium products produced in the United States using U.S. technology, and government funding or financing of U.S. technologies through measures such as tax credits or loan guarantees. Carefully tailored measures such as these could avoid harming U.S. energy security by minimizing negative impacts on Centrus and U.S. nuclear utilities, while

encouraging the revival of a U.S. nuclear fuel cycle that is not subject to obligations to foreign governments, to the benefit of the Nation and its defense and energy security

City of Grants, New Mexico

The City of Grants, New Mexico is in full support of actions taken in response to the Uranium 232 investigation to help restore the declining U.S. uranium mining industry. Grants, New Mexico was once known as the "Uranium Capital of the World" when it thrived on a uranium mining industry that created a strong economy, employed thousands of hardworking Americans, and supported advanced medical services and incredible education opportunities in the community. Unfortunately, Grants – along with the rest of the U.S. uranium mining industry – has been in severe decline for the past several years, due to excessive uranium imports from state-owned enterprises in geopolitical rival countries such as Russia, Kazakhstan, Uzbekistan, and China.

Historically, the uranium industry in the southwest has been a major economic driver for the region. It has provided hundreds of good jobs (with high salaries and benefits) and tax revenues that have helped to finance local schools, roads, hospitals, and other critical infrastructure. Unfortunately, these benefits have declined alongside the industry, as production has halted to a virtual standstill. This decline, however, is not due to a lack of uranium or human resources. In fact, New Mexico and its neighboring states of Utah, Arizona, and Colorado have abundant in-ground resources, considerable existing uranium infrastructure, and sufficient qualified workers capable of supplying defense and energy needs for decades to come. Instead, this decline is due to unfair trade practices by U.S. rivals, who use state-owned enterprises to destabilize the uranium market by selling uranium at less than fair value. This is a clear and present threat to U.S. national security.

To this end, the City of Grants supports the remedies proposed by the investigation petitioners, which it sees as reasonable, achievable, and economically feasible. Implementing a quota reserving 25% of the U.S. market for U.S. producers will help to preserve and grow a viable domestic uranium industry, while at the same time imposing minimal cost on utilities and ratepayers. In addition, a requirement that government utilities and agencies purchase uranium from U.S. producers in accordance with the President's "Buy American" policy seems to be common sense. Even reopening one mine through increased demand could create up to 300 jobs, generate over $60 million in tax revenues, and create over $30 million in employment income over a ten-year period. The Department of Commerce must consider these facts to suggest proper and necessary remedies to restore the domestic uranium mining industry, and protect the national security of the United States.

The Colorado Mining Association

The Colorado Mining Association (CMA) is in full support of actions taken in response to the Uranium 232 investigation. The CMA is a trade organization incorporated in 1879, with over 1000 members across numerous different industries across the mining sector. It recognizes the status of the uranium mining industry as having been an economic mainstay in Western Colorado for decades, and reaffirms its continuing impact in the communities where mines continue to operate.

In 2017, U.S. uranium production fell to near historic lows due in large part to uranium and nuclear fuel imported from state-subsidized foreign entities, and in 2018 U.S. producers may have produced less than 2% of our nation's needs. Uranium is essential to our national defense, including providing fuel for the U.S. Navy and representing the backbone of our nuclear deterrent, and yet over the past decade this key domestic industry has shrunk to the point that U.S. national security is now threatened. State-owned enterprises in Russia, Kazakhstan, and Uzbekistan are targeting the U.S. uranium industry, currently fulfilling over one-third of U.S. demand. Moreover, Chinese state-owned entities have announced plans to penetrate the U.S. nuclear market, threatening to further degrading U.S. energy security and national security. At the same time, traditional allies like Canada and Australia, mines are shutting down and reducing production because of similar unfair trade practices.

The U.S. uranium mining industry can compete on a level-playing field with anyone. However, the anticompetitive practices of state-owned and state-subsidized entities are putting U.S. producers at an enormous disadvantage. To combat this threat to the national security, the CMA supports a 25% quota reserving market share for domestic uranium, as well as a "Buy American" policy for all U.S. Government purchases. While these actions will have an impact on rival foreign entities, they will have very little impact on U.S. utilities and their customers. Without prompt action on this front, uranium imports from Russia, China, and other geopolitical rivals will increase significantly in the future, and further imperil the national security of the United States.

Colorado State Senator Kevin Lundberg

Colorado State Senator Kevin Lundberg supports action through the Uranium 232 investigation. The degradation of the domestic uranium industry of the past decade has caused the national defense to be threatened as well as energy security to be compromised. Threats come from state-actors that compete with the U.S. for geopolitical influence and commercial advantages and the senator iterates that dependence on Russia and its allies is dangerous. Senator Lundberg also voices concern that growth of Chinese owned uranium may also pose a threat.

Senator Lundberg supports a quota reserving 25% of the market for U.S. uranium producers as well as a 'buy American' requirement for government utilities and government agencies.

ConverDyn Honeywell

ConverDyn Honeywell opposes any tariffs taken as a result of the Uranium 232 investigation, as such a remedy could have a significant adverse impact on their role as a uranium trading platform, on ConverDyn's primary conversion business, and on U.S. non-proliferation objectives more broadly. ConverDyn is the exclusive agent for the sale of uranium conversion services from the Metropolis Works (MTW) plant located in Metropolis, Illinois, owned by Honeywell International. ConverDyn is the sole supplier of conversion services located in the U.S. and MTW is the sole uranium conversion facility in the U.S. As such, ConverDyn plays a key role in maintaining a domestic source of uranium hexafluoride (UF6) to support the nation's nuclear power plants. ConverDyn has the capacity to provide approximately 40% of domestic conversion requirements while also supplying nuclear generators in Europe and Asia.

Trade remedies – especially tariffs – threaten to harm ConverDyn's primary businesses. One major source of revenue comes by acting as a trade platform through MTW. Uranium suppliers – both domestic and international – pay ConverDyn to store uranium at MTW prior to selling the material to third parties. Because MTW serves as a trading platform, suppliers may not know the identity of the eventual buyer, or whether the buyer is domestic or international, upon initial delivery to MTW. The imposition of tariffs on imports of uranium would undoubtedly cause suppliers to divert uranium otherwise destined for MTW to other locations outside the United States if the supplier did not have a known domestic customer at the time of import. This would reduce the amount of uranium that is stored and traded at MTW and would lead to millions of dollars in lost revenue per year.

A significant portion of ConverDyn's conversion business is providing service to non-U.S. customers. Each of these customers purchases uranium from foreign sources, imports the uranium into the U.S. for conversion at MTW, and then sends the material on to an enrichment facility, whether in the U.S. or elsewhere. Foreign customers are unlikely to contract with ConverDyn if there is any risk that their uranium will be subject to a tariff on import. There is no need to pay a premium for a service in the U.S. that can be performed elsewhere.

Beyond the immediate commercial implications for ConverDyn, a decrease in the amount of imported uranium could have national security implications. All uranium that is delivered to the MTW, no matter its eventual destination, picks up U.S. "consent" rights. Consent rights support U.S. non-proliferation objectives by requiring prior U.S. approval for enriching or reprocessing the uranium upon export and apply to retransfers of nuclear materials and equipment to third countries. If material that would otherwise be delivered to MTW is diverted to other locations as a result of a tariff, the United States ability to influence end uses of nuclear material would be severely curtailed. The United States would lose its ability to monitor a significant portion of the global market in nuclear fuel.

As the only uranium conversion company in the United States, ensuring the financial profitability of ConverDyn's businesses is of concern to both the stability of the American nuclear generating fleet, and non-proliferation national security goals. While quotas would not cause such damage to ConverDyn, an implementation of tariffs could prove disastrous, and the effects of such a policy should be analyzed closely before it is implemented.

Council on Radionuclides and Radiopharmaceuticals

The Council on Radionuclides and Radiopharmaceuticals (CORAR) oppose any action taken in response to the Uranium 232 investigation that would result in a negative impact to the availability of low enriched uranium (LEU) necessary for producing radiopharmaceuticals, such as molybdenum-99 (Mo-99) or technetium-99m (Tc-99m). CORAR represents 18 different companies spanning the Radionuclide and Radiopharmaceuticals industries, supporting their commitment to research and development manufacturing and distribution of radiopharmaceuticals and radionuclides, which are used as tracers in the diagnosis and treatment of many diseases.

Mo-99 is crucial in that it decays into Tc-99m, which is used in half of all nuclear cardiology procedures, a quarter of all nuclear oncology procedures, and in many other procedures where an inner part of the body needs to be imaged. Unfortunately, both Tc-99m and Mo-99 have very short half-lives of 66 hours (meaning they decay quickly). This means that these materials cannot be stockpiled, and must instead be produced and quickly distributed to hospitals and other imaging facilities.

When determining the correct action on implementing duties, tariffs or quotas as a part of the Section 232 investigation, CORAR urges the Department to consider the importance of a reliable supply of medical radioisotopes (including Mo-99) for patients in the US. Specifically, CORAR wants to highlight two concerns: potential impact on the U.S. Department of Energy's efforts to develop domestic radioisotope production and DOE supply of LEU (most often derived from U.S. stockpiles of HEU).
CORAR urges the Department to ensure that any actions taken in light of the investigation will not adversely affect the production of medical isotopes including the U.S. Mo-99 supply, which could delay and prevent critical medical imaging and procedures.

Dominion Energy

Dominion Energy is not in support of the 232 petition. Dominion Energy is a member of both the Ad Hoc Utility Group (AHUG) and the Nuclear Energy Institute (NEI) and supports both of their submitted comments.

Dominion Energy operates in 19 states in the U.S. and is one of the largest producers and transporters of energy serving over 6 million customers. Their operations while not exclusively nuclear do consist of the operation of 6 nuclear reactors. The 6 reactors they operate have the capacity to serve 2.9 million homes.

Dominion asserts that the energy market conditions effect reactors in a fundamentally different way than front end operations. They cite the closing of their Wisconsin reactor in 2013 as a result of projected lower energy prices. Once a reactor is shutdown it is likely a permanent shuttering of operations, Dominion believes this is different than mining operations which can be idled and resume again when the market is more favorable.

One of the key facets in running a nuclear plant is properly timed, scheduled deliveries of uranium – foreign availability keeps possible delivery interruptions to a minimum, and the only interruptions in nuclear fuel component deliveries that they have experienced have been from U.S. based fuel cycle suppliers. Their operation has a strong focus on mitigating risk and minimizing periods of outage in their reactors which is why they source from a diverse portfolio of suppliers. Additionally they maintain their own inventory of uranium as well as some options on their supply contracts to call for additional supply.

Dominion has supported domestic fuel cycle facilities across the entire fuel cycle and has entered into contracts to support U.S. production facilities. They state that they have continued to provide support so companies can operate even with further implementation of regulations. Ultimately they believe that the industry as a whole is struggling to remain competitive and they do not support and unnecessary costs. They recommend finding options to address shortage issues that involve investment in the domestic uranium industry, but not that would impose quotas, tariffs, or other trade barriers.

Energy Fuels USA Inc. and Ur-Energy USA Inc.

Energy Fuels USA assets include the only operating conventional uranium mill in the US and some of the largest highest grade uranium mine and projects in the US, they own five ISR plants as well. Energy Fuels Resources (USA) Inc. and Ur-Energy USA Inc. supports the proposed quota to a tariff as it would restore a sustainable U.S. uranium mining industry, bolster national security, and support energy security. They are the both the filers of the petition.

One of the largest concerns in addition to the increase in competition from SOE's of geopolitical rivals is that if uranium companies do go bankrupt it will be very difficult to revive them. Recent trend suggests that smaller companies have advanced uranium projects. These smaller companies do not have large capital to sustain tremendous losses. Once a project is decommissioned it takes years plus tens or hundreds of millions of dollars to bring it back on line. Another major concern of EF is the rising demand for uranium in both the public and private sector. If current trends continue the US will be increasingly reliant on these nations for the fuel that supplies 20% of all US electricity and 60% of US emission free electricity.

EF firmly believes that the US uranium industry can be healthy with the installation of a quota. EF states that the US Uranium supply is larger than the EIA reports because the EIA does not take into account inferred resources. When inferred resources are accounted for total known resources increases to over a billion pounds. Which is ample resource to supply the US for decades and new resource are yet to be discovered. They believe that the domestic uranium supply can support the increase demand from the quota. EF also believe that having a larger uranium stock pile improves national security

EF believes the best remedy for the domestic uranium production is through quotas rather than tariffs. Tariffs are less likely to provide effective relief and will be costlier for U.S. utilities and the U.S. economy than the quota remedy proposed in the petition. The quota approach would also be less disruptive to utilities' existing relationships, apply to only a portion of their imports, and provide the necessary support for the domestic mining industry at lower cost. The probable economic impact of a tariff on U.S. utilities would likely be more than four times as high as for the quota. Estimates for the cost of utilities after the proposed 25% quota are small, resulting in approximately a 0.1% increase in the average electric bill. EF is in full support of a 25% buy domestic quota.

Exelon Generation Company, LLC

Exelon Generation Company, LLC (Exelon) is opposed to remedies put forth by the Section 232 investigation into uranium imports and holds that imports of uranium do not threaten national security and no action should be taken to adjust such imports. Exelon is a wholly owned subsidiary of Exelon Corporation, a Fortune 100 company that does business in 48 states and in the District of Columbia and employs 34,000 people nationwide. Exelon operates the largest nuclear fleet in the nation, representing 20% of the nation's nuclear generation. Exelon's views are critical to a national security analysis of the investigation. Given that uranium powers 99 U.S. commercial nuclear reactors that produce 20% of electricity for the U.S. electric grid, it is a crucial element to U.S. critical infrastructure. Nuclear generators, like Exelon, operate those commercial nuclear reactors and oversee the processing of uranium at all stages. This includes the "industrial consumption" of nuclear fuel that powers our grids.

Making adjustments to uranium imports or mandating purchases of U.S. uranium would not benefit national security. On the contrary, it would drive U.S. uranium prices up and cause premature closures of nuclear plants, which would erode national security and result in the loss of thousands of direct and indirect jobs across America. Petitioners, two U.S. companies owned by Canadian entities, seek to misuse the section 232 process to create an artificial market that would result in depleting a scarce U.S. resource that should be maintained for future U.S. national security needs. In fact, Petitioners have been reselling foreign-origin uranium to U.S. generators while claiming that the imports threaten national security.

Exelon's own experience with fuel risk management has demonstrated that import adjustments and/or mandated buying of U.S. uranium will have a negative effect on national security. A diverse worldwide supply base is necessary to maintain a secure fuel supply for the electric grid. Maintaining a safe supply base is achieved though buying uranium from worldwide suppliers well in advance of the need date and maintaining an inventory at each stage of the process at multiple U.S. locations. For almost 60 years, Exelon's fleet of nuclear reactors has never experienced a delay in electricity operations due to a late delivery of fuel. In Exelon's experience as the operator of the largest nuclear fleet in the nation, maintaining diversity in fuel origin strengthens the electrical grid and enhances our national security.

Exelon holds that certain actions such as the ones put forth in the Uranium 232 investigation would have detrimental, irreversible effects on the uranium industry in the U.S., specifically leading to heightened nuclear utility costs, the retirement of additional nuclear facilities, and the loss of high paying jobs. Unlike the case with uranium mines that may be put on standby to maintain scarce U.S. resources for national security purposes, premature nuclear plant shutdowns are permanent. Exelon maintains that the U.S. Government should support a vivacious civil nuclear industry as part of its important role as worldwide leader for nuclear non-proliferation. Actions to adjust

imports under this 232 investigation would damage the industry and negatively impact national security.

First Energy Nuclear Operating Company

FENOC voices its concerns about potential remedies as a result of the 232 investigation. They believe that a quota would do more harm to the energy industry than it would do to help uranium miners. FENCO believes that if uranium quota was put in place that it would raise prices of uranium and cause some plants to close prematurely.

FENCO also disputes the claim that Russia is flooding the market with cheap uranium because FENCO believes economic factors have led the decline in uranium prices. FENCO cites the Fukushima disaster as a contributing factor to the shuttering of 58 power plants. They also believe the all-time low price of natural gas has created a cheaper alternative and thus has effected the decisions of energy companies. They also cite the subsidization of renewable resources impacts uranium prices because it creates more market share for wind and solar power eating into the market share of uranium

According to FENOC, there is no national security risk in the current strategy for importing uranium from America's allies. FENOC believes Australia and Canada are reliable suppliers. Diversification ensures national security by mitigating risk. Additionally, the DOE has certified there is a surplus of available military grade uranium. FENOC believes that the proposed quota is irrational due to the fact that the US only has 1% of the world uranium supplies. A quota in place would only quicken the depletion of a limited resource.

FENOC strongly opposes the quota because demand can be met with Canadian and Australian imports and FENOC believes that the DOE and DOD are under no security threat as their current needs are fulfilled and new requirements are decades away. A quota would increase prices and increase pressure on an already struggling nuclear energy industry. FENOC believes the job loss to the nuclear energy industry will be greater than the gain of jobs in the mining industry. One power plant employs 500-700 employees and closures will cause lost wages and lost tax revenue. FENOC does not believe that a quota is a sustainable and viable option for America.

Flour BWXT Portsmouth

Flour BWXT Portsmouth (FBP) is a decontamination and deconstruction contractor as set forth in their prime contract at the Portsmouth Ohio gaseous diffusion plant. FBP manages 2,000 enrichment D&D employees. FBP has received transfers of DOE Environmental Management owned excess Uranium as barter in exchange for equivalent value in D&D

FBP proposes if Department of Energy (DOE) does not extend its current uranium barter suspension then FBP has agreement from their subcontractor, Traxys NA, to offer the remaining U.S. Government Excess Uranium from Paducah/Portsmouth remaining to be dispositioned to the domestic uranium mining, conversion and enrichment entities at prevailing near-term spot market prices during the initial 2-3 years of their proposed Ten-Year Quota. Benefits of this proposal are: firstly, the next impact of imposed quota sales would be a lower, price averaged impact upon the U.S. nuclear fleet. Secondly, the Government quantities backstopping the domestic producers' commitments to U.S. buyers could give those domestic buyers enhanced assurance of supply. Third, Enrichment GDP D&D activities are currently funded through appropriations, but any funds from this solution will supplement the appropriations, thereby mitigating the projected future shortfall of the Uranium Enrichment D&D Fund.

FBP strongly believes that US Uranium production has not fallen because of DOE transfers, but has fallen due to expansion in production in Canada and Kazakhstan. FBP acted in behalf of its domestic companies to share D&D work scope with the domestic converter and also exhort uranium sales subcontractor and in sharing and offering the placement of the DOE-FBP barter derived uranium through these domestic companies.

Government of Canada

The Government of Canada opposes any measure taken in response to the Uranium 232 investigation which would harm the free and open trade relationship between the United States and Canada. The U.S. and Canada share the world's largest and most integrated bilateral energy relationship, which contributes significantly to U.S. national and energy security. Uranium from Canada is a secure, reliable, and market-based input for the U.S. nuclear fleet, and remains a substantial benefit to American energy security.

Canada has been an important trading partner in the uranium industry for over 75 years, both as a provider and an investor. For example, Cameco Corporation, based in Saskatchewan, Canada, has invested more than $1 billion in its mining operations in Wyoming and Nebraska, in addition to its interest in other prospective technologies further along the nuclear fuel cycle. At the same time, since 2011 Cameco has purchased about $360 million worth of goods and services from more than 920 U.S. vendors for use at its Canadian operations. Any trade remedies that would negatively impact this industry or the trade relationship between Canada and the U.S. poses a serious risk to many of the benefits this partnership provides.

This is not to say that the pressures the U.S. uranium industry is facing are not real; on the contrary, many of the issues faced by American businesses are felt by Canadian corporations as well. Low prices plague the market, reducing operational viability and ensuring that only one-third of the world's mines can produce uranium profitably at current spot prices. This is accentuated by the prevalence of State-owned enterprises (SOEs), who have been selling large amounts of uranium at spot market prices regardless of production costs – often even at a loss – which has reduced long-term contract prices on which the Canadian and U.S. uranium industries rely. These factors all contribute to the lack of a global level-playing field for uranium mining, harming both Canadian and American industry.

Uranium imported from Canada does not threaten U.S. national security. In fact, the opposite is true: restricting Canada-U.S. uranium trade could harm the U.S. economy and weaken U.S. national security. The petition from the two U.S. uranium companies that initiated this Section 232(b) investigation contained a warning about growing U.S. dependence on production from SOEs in countries not aligned with U.S. policy interests. If trade action is taken as a result of this investigation that restricts the free flow of trade between the Canadian and U.S. nuclear industries, this situation could in fact worsen, having the exact opposite effect to what U.S. stakeholders are seeking. Furthermore, it should be noted that Article 907 of the Canada-U.S. Free Trade Agreement exempted Canadian energy products from national security-related trade restrictions, as long as those energy products are used for non-military purposes. Canadian uranium is not used for U.S. military purposes, therefore allowing this exemption.

To conclude, uranium imports from Canada do not threaten to impair U.S. national security. Open uranium trade with Canada strengthens U.S. national security by allowing the U.S. nuclear

power industry to purchase uranium from its most trusted, stable, and reliable trading partner. Overlooking this reality could leave the United States even more dependent on state-owned production from non-allied countries, increasing the influence of those governments whose actions are destabilizing the market, and therefore causing the very harm that the petitioners are looking to prevent.

Grand Canyon Trust

The Grand Canyon Trust is a non-profit conservation advocacy organization based in Flagstaff, Arizona with 3,000 members. GCT was founded in 1985 with the mission to protect and restore the Colorado Plateau. They do not support the petition because they believe that information in the petition is misrepresenting and misleading. Additionally, they believe expansion on domestic uranium production is not an economically viable because of regulation and restrictions.

GCT does not believe that Russia, Kazakhstan and Uzbekistan are flooding the market and posing a risk to American national security. They cite US government data stating the majority of uranium imports came from Australia and Canada (68%) and only 32% came from Russia, Kazakhstan and Uzbekistan. According to GCT the proposed quota will drive up domestic uranium prices by 69% by 2022. This could cause many nuclear power plants to close resulting in the loss of 500-700 jobs per power plant. The entire US uranium industry has not employed more than 1,600 people nationwide in the past 24 years.

GCT main concern is that the expansion of mining in America will destroy some parts of the Grand Canyon. GCT does not want the quota to encourage expansion of mining into spots that are of natural beauty and cultural sensitive areas. It isn't appropriate to prioritize uranium mining as it could destroy the rich cultural and ecological resources that have proven to be high value in the region. They believe that mining in the Grand Canyon region does not make sense economically because of lack of deposit and the grade is well below that of uranium that is imported from Australia and Canada.

GCT does not support a quota on uranium production because they don't want mining expansion to disrupt the natural beauty of the Grand Canyon Region. Additionally, GCT does not believe the US really demands uranium, overall the US is able to meet uranium needs with low to moderate risk until 2040 for tritium production and until 2060 for other assets. When combined with excess inventories managed by the US government, the US could complete 100% of its anticipated future fuel demands for 4 years or for more than 8 year if the US continues to buy consistent supplies from Australia and Canada.

Illinois Commerce Commission

The Illinois Commerce Commission is against any trade barriers imposed as a result of the Uranium 232 investigation. The state of Illinois has the country's largest nuclear fleet, numbering 11 units, which provide the state with a safe, reliable, and affordable source of electricity. These reactors generate approximately $9 billion in total economic output annually, contributing $6 billion to the GDP of Illinois. Nationally, reactors like these advance U.S. national security by providing resilient baseload electricity to defense installations.

Any trade barriers imposed on uranium supply, however, will harm the ability for these reactors to turn a profit. Recent market pressures have seen a sharp reduction in nuclear power growth, and 13 nuclear plants are scheduled to shut down prematurely over the next 7 years. This damage would only be accelerated by the 25% quota suggested by the petitioners, with a recent study estimating that this quota would raise costs to the nuclear fleet by between $500 and $800 million dollars. This massive cost increase will force more plant closures, weakening the American electrical grid, and increase the price to ratepayers, with a disproportionate amount of this harm felt by Illinoisans.

The nuclear fleet, and domestic uranium production, are undeniably important to U.S. national security. But we must support domestic uranium with methods other than harmful trade remedies, or we risk causing the very harm we seek to avoid.

Indiana Michigan Power

Indiana Michigan Power, located in Ft. Wayne Indiana, provides service for approximately 587,000 customers in both Michigan and Indiana. They do so by purchasing uranium from various companies all over the world sourcing from both domestic and foreign producers. Their main nuclear power plant, the Donald C. Cook (DC Cook) nuclear power plant has not had a delay in uranium deliveries in the history of the plants operational history, and does not expect one in the future. They specifically address the criteria listed in 15 CFR 705.4(a)(5) and (b)(1).

Their plant consistently produces over 2,100 megawatts of carbon-free electricity for their customers in Indiana and Michigan, and do so at the lowest possible costs. They cannot support the Department's Section 232 investigation as they believe it would hinder the national economy via increases in the costs of Uranium. They believe if there is a concern for the future need of a domestic uranium sources relevant to national security, the cost to maintain that domestic uranium source should not fall upon the commercial nuclear fleet. This will inevitably shift the burden to consumers.

Laramide Resources Ltd.

Laramide Resources Ltd. (Laramide) is in full support of the Department's Section 232 investigation into uranium imports and calls for swift action to be taken in order to revive and protect the uranium industry in the U.S. Laramide, a Canadian based company, owns large development stage uranium projects in the U.S. that are strategically positioned. Major U.S. assets include the Church Rock and Crownpoint *in Situ* Recovery (ISR) projects in New Mexico and hard rock, conventional projects La Jara Mesa, in New Mexico and La Sal, Utah. The Church Rock and Crownpoint properties have near-term development potential, with many required approvals in place and significant mineral resources all making it a compelling project. Laramide is also in possession of a historic exploration database for these and neighboring properties that includes physical and geophysical logging information, historic mapping and interpretation.

Laramide is an active member of the Uranium Producers of America (UPA) trade organization and supports its position that the current market imbalance caused by excessive imports from state-owned enterprises and the state of the U.S. uranium industry clearly warrant the Administration to take appropriate actions. Laramide emphasizes the risk to intellectual property that the uranium crisis poses. Without a robust market to sustain the intellectual property, the ability to maintain it is tenuous at best. Laramide's database that identifies these resources and the human capital capable of using it are at risk of being lost.

The uranium industry faces a human resource crisis where the professionals who are experienced with uranium recovery technology are dwindling. Unless there is a revival in the industry that encourages the next generation of technical professionals and miners to enter the field soon, their knowledge and expertise will be lost for good. The precipitous fall in employment levels of the industry is a cause for concern and poses a direct threat to our national security. Restoring the uranium mining industry is important for many reasons, specifically to protect our national security against foreign entities that do not have our best interest in mind and to protect the valuable intellectual property involved in the industry.

The Minerals Council of Australia

The Minerals Council of Australia (MCA) opposes any actions taken in response to the Uranium 232 investigation that would impose restriction on imports of uranium. The MCA is the peak industry organization representing Australia's exploration, mining and minerals processing industry, representing more than 85 per cent of Australia's annual minerals industry production and a higher share of minerals exports. It includes a Uranium Forum which comprises 10 full members and two associate members covering Australia's uranium producers, major developers, explorers and service providers to the industry.

The MCA submits that it would be contrary to the national security interests of the United States to impose restrictions on the imports of uranium, especially from reliable, stable, and market-based suppliers such as Australia. It does this by refuting a number of key issues raised in the petition:

"Foreign state-owned companies have targeted the US" – Australia's current supply is neither state-owned nor the recipient of government subsidy. It competes in an open, global market, and operates in accordance with sound market principles. There are no Australian uranium operations which are owned or operated by state or federal governments.

"The threat comes from Russia, Kazakhstan, and China" – Greater than 50 per cent of American uranium imports come from Canada and Australia. Australia hosts several important market-based suppliers, making long term investment decisions based on market principles and assuming effectively minimal US sovereign risk to market access. Australia is not a threat but an important supplier, and import restrictions would have significant implications for long term investment in Australian uranium supply that would ultimately be a risk to US national security interests.

"US domestic producers 'face increasing financial pressure' and 'have laid off more than 50 per cent of their workforce'" – This is not unique to US producers. The global uranium market has yet to fully recover from the demand response following Fukushima in 2011 even though there has been substantial growth in demand, in particular from China. Nevertheless, demand growth and recovery are underway and investor interest in the uranium sector is returning. That investor interest is focused on market friendly jurisdictions such as Australia.

"Foreign nationalistic interests increase the national security threat" – The US nuclear industry is more dependent on a well-functioning global uranium market than on foreign nationalistic interest. Secure, reliable long-term uranium supply for US nuclear utilities requires a country like Australia, with its enormous uranium reserves, to continue to create a stable domestic and

foreign investment climate, and to retain strong diplomatic, trade and cultural relations with the U.S. American trade restrictions would create uncertainty for that investment.

The MCA recommends that the Department of Commerce reject any calls for quota protection measures. Access to market-based imported uranium from Australia provides additional security of supply for U.S. civilian nuclear power plants, and imposing domestic protection will threaten on-going investment in Australian uranium by introducing unnecessary risk to market access. Should the Department of Commerce consider that further support is needed for US nuclear fuel supply, the Australian uranium industry recommends that focus should be on the extensive fuel cycle activities which occur post-mining on US soil; namely conversion, enrichment, and fuel fabrication.

New Mexico Mining Association

The New Mexico Mining Association (NMMA) voices its full support for any action taken due to the Uranium 232 investigation that would help to reinvigorate the critically imperiled uranium mining industry. The NMMA once claimed over a dozen uranium companies as members of its trade association, but now sees only three out of their 98 members involved in uranium extraction (Energy Fuels Resources, Rio Grande Resources Corp. and Uranium Energy Corp.). One of these members is Energy Fuels Resources (USA) Inc., an original petitioner for the 232 investigation, a petition supported in full by the NMMA.

Recent studies estimate that over 400 million pounds of uranium reserves remain unextracted within the state of New Mexico. This is enough uranium to completely fuel every nuclear power plant across the U.S. for the next 12 years. Despite this fact, last year not a single pound of uranium was produced within the state. Instead, American nuclear power companies purchased over 90% of their uranium from foreign sources, with almost 40% coming from Russia, Kazakhstan, and Uzbekistan. In comparison, the U.S. Energy Information Association estimates that less than 2% of the uranium American power companies will use to generate power this year will have originated within the United States. Having such a large segment of the U.S. power generating capacity dependent upon foreign imports is not in the best interest of the citizens of the U.S., and perhaps more importantly, the U.S. military needs a viable domestic uranium industry to fuel the U.S. Navy and to modernize our nuclear deterrent.

To this end, the NMMA supports policies that would see U.S. utilities required to buy some percentage of their fuel – a relatively insignificant operating cost for them – from domestic producers. This could stimulate renewed or expanded uranium production from the few companies that remain, and possibly incubate new companies in the future. An economic analysis of just one proposed uranium mine and mill project in New Mexico found that one mine could contribute nearly $65 million to state and local coffers over 10 years, and create several hundred meaningful jobs in an area with extremely high unemployment rates.

Grants, New Mexico was once characterized as “The Uranium Capital of the World”, due to low uranium prices and a glut of supply from state-owned foreign entities pursuing unfair trade practices, Grants’ mining operations have all but disappeared. Decent jobs became few and far between, crime rates and unemployment soared, the tax base shriveled, and government services suffered. A renewed domestic uranium mining sector could rejuvenate Grants, providing gainful employment and restoring funds to a crippled local government. This is a story all too common in towns throughout the United States, but fortunately one that can be reversed. Restoring the uranium mining industry isn’t simply a priority for ensuring U.S. national security, it is a necessity for restoring American economic prosperity.

The Nuclear Energy Institute

The Nuclear Energy Institute (NEI) is thoroughly against any action taken based on the Uranium 232 investigation that would result in fundamentally flawed trade remedies such as quotas or tariffs. NEI includes representatives from 20 different nuclear utility companies which make up the large block of membership, and membership of hundreds of different organizations across the globe. Their vast global membership includes the section 232 petitioners, mining operations both domestic and foreign owned (Canada and Russia) and fuel fabricators. This is a partnership dedicated to spreading information about the safety and importance of nuclear power generation, and as such is uniquely informed on the needs and abilities of the American operating reactor fleet.

Nuclear energy provides significant benefits to the United States. In 2017, nuclear energy produced 20% of the U.S. electricity supply and prevented 554 million metric tons of carbon dioxide emissions, accounting for close to 60% of America's carbon-free, clean air electricity. In addition, nuclear energy contributes approximately $60 billion annually to the gross domestic product of the United States, accounts for approximately 475,000 full time jobs (direct and secondary), and provides nearly $10 billion annually in federal tax revenues and $2.2 billion in state tax revenues. A typical single unit nuclear plant employs between 500 and 700 workers in jobs that pay, on average, 36 percent above the prevailing local wage rate. To put that in perspective, the closure of just one plant would lead to a loss of more jobs than the entire U.S. uranium mining industry.

Despite these facts, the U.S. nuclear power industry is currently at risk, with premature plant closures occurring at an alarming rate. Depressed power markets put strain on the profitability of nuclear plants, and when a plant closes – unlike a uranium mine – it does not return to service. This is devastating to local communities, causing towns like Carlton, Wisconsin – once the home of the Kewaunee power plant and the nearly 1000 workers it employed – to raise taxes, cut services, and see institutions like their local school system to disappear. Further plant shutdowns due to increased operating costs would not only repeat stories like this across the country, but endanger one of the most reliable baseload power generating sectors in the country, a significant threat to both national security and American prosperity.

Recently, more than 70 dignitaries, comprised of former U.S. statesmen, flag officers, generals, national security officials and industry leaders, signed a letter to U.S. Secretary of Energy Rick Perry highlighting nuclear energy's national security importance and imploring the Administration to take immediate action to prevent the closure of reactors. The signatories recognized that policies that impede the continued operation of the nation's nuclear fleet are likely to diminish U.S. influence over nonproliferation and create conditions that weaken the

implementation of safety standards adopted by all other nations; all of which affect U.S. national security.

Yet the proposed 232 remedies, especially the implementation of a 25% quota on domestic uranium, threaten to undermine these very national security benefits. At the same time, the perceived threat of the usage of imported uranium is very much overblown. Not only do most of our imports come from friendly allied countries, especially Canada and Australia, but in fact total purchases from Russia, Uzbekistan, and Kazakhstan decreased from 2015 to 2017. In addition, when you take into account Australian and Canadian imports plus American production, inventory, and Department of Energy surplus, we have more than enough uranium to fully sustain our nuclear consumption over an unlikely 4-year emergency. Together, this means that using the Department of Commerce methodology from their 1989 investigation, there would be no threat to the reliability of electricity provided to the grid by nuclear power plants due to a loss of uranium supply from “unreliable” countries.

Nuclear power – and uranium as a resource – are undeniably important to American national security. However, the use of imported uranium does not threaten this relationship. The struggles of the domestic uranium mining industry are great, but they are born out of market conditions, and therefore do not imperil the national security. Bolstering U.S. uranium production can be done through methods that do not involve fundamentally flawed trade remedies, especially as market trends suggest a rebalancing of supply and demand that should soon return the domestic mining sector to viability. Whatever the proposed solutions may be, the Department should ensure that their remedies do not cause the exact security concerns they sought to avoid.

Premier of Saskatchewan, Canada

The Premier of Saskatchewan, Canada on behalf of the Province of Saskatchewan, Canada supports the Section 232 investigation into uranium and is in agreement with the motives behind the investigation. However, the Premier encourages the Department to take note of the distinction between publicly traded companies from U.S. allied countries and state-owned entities that are the targets of the petition. Canadian uranium poses no threat to U.S. national security and is an essential component of the U.S. energy supply; therefor it should be exempt from any trade actions taken as a result of this investigation.

Saskatchewan recognizes the importance of its relationship with the United States. The U.S. is the province's largest trading partner for imports and exports. In 2017, exports to the United States accounted for 55% of Saskatchewan's total exports. The U.S. supplied 85% of the total imports there that same year. Saskatchewan is committed to maintaining such a positive relationship.

The Province of Saskatchewan holds the second largest uranium deposits in the world and accounted for 22% of global production in 2017. Northern Saskatchewan is home to the McArthur River and Cigar Lake mines which are the largest and highest-grade uranium mines in the world. Continued exploration of these sites shows great potential for future production.

Canada's two main uranium producers are Cameco Corporation and Orano Canada Inc. Both have felt the effects of the market distortions brought forth by the petitioners. Production suspensions at Cameco's North American operations have caused the loss of over 1,500 jobs in both the U.S. and Canada. Communities in northern Canada mirror the dire situation present in many uranium mining towns across the U.S., as there are few other economic opportunities. As a response to the depression in the uranium market, Saskatchewan-based Cameco has suspended much of its operations in Canada and the U.S. Cameco has invested over $1 billion into operations in Nebraska and Wyoming and paid out $250 million in salaries and benefits to American workers. While Cameco was in operation, it was the largest uranium producer in the U.S. and Canada.

Uranium from Saskatchewan plays an important role in upholding U.S. nuclear energy security. Canada's nuclear non-proliferation treaty with the U.S. mandates that all Canadian uranium be used for peaceful purposes; therefor it does not contribute to the U.S. military supply. Leading industry experts stress that trade actions against uranium imports would cause large increases in fuel costs for U.S. nuclear energy producers. It is estimated that a quota ensuring a 25% share for domestic producers could cost anywhere from $500 to $800 million per year and cause job loss and the closure of nuclear generators. Such actions would actually increase U.S. reliance on uranium imported from state-owned enterprises, as Canadian production would decrease. Canadian uranium poses no threat to U.S. national security and any measures taken

against Canada would be counter productive for both the American and Canadian economies. Therefor, Canadian uranium should be exempt from any trade measures taken as a result of the investigation.

San Juan County, Utah

San Juan County, Utah supports the Department's Section 232 investigation into uranium imports. San Juan County has a rich history in uranium mining and is home to the White Mesa Mill, the only conventional uranium mill licensed to operate in the United States. It is crucial to maintain favorable conditions for the only uranium mill licensed to operate in the U.S. The County's economy depends on the energy sources it holds in its area and uranium mining is one that would be beneficial to the region's economic growth, among the many others that engage in uranium mining.

Over the past decade, U.S. uranium production fell to historic lows due in large part to uranium and nuclear fuel imported from state subsidized foreign entities. These state subsidized foreign entities, such as Russia and China, are geopolitical rivals of the U.S. who often utilize their state-owned energy industries as tools of foreign policy. This poses a grave threat to our national security. Our allies in Canada and Australia are shutting down mines and reducing production for the same reasons that our U.S. mining industries are being affected. For them, competing with state owned enterprises in Russia, Kazakhstan, and Uzbekistan is not possible.

The remedies put forward by the Petitioners, a 25% quota and "buy American" policy for U.S. Government purchases will have a desirable impact on foreign entities but very little impact on U.S. utilities and their customers. The U.S. uranium industry is more than capable to increase production and meet requirements, given a number of permitted and constructed mining and processing facilities currently in operation or on standby. The Administration can help create thousands of jobs, including Native American jobs, with good salaries and benefits, along with increased tax revenues that support rural schools, hospitals, and other local infrastructure.

Select Federal Natural Resource Management Committee of the Wyoming Legislature

The Select Federal Natural Resource Management Committee of the Wyoming Legislature expresses its support of the Department's Section 232 investigation into uranium imports. Wyoming has been the largest producer of mined uranium in the U.S. over the last 20 years and supports the investigation for national security purposes and for the economic well being of Wyoming's communities.

The uranium industry in the U.S. has seriously deteriorated in recent years due to imports from state-sponsored nations such as Russia, China, Uzbekistan and Kazakhstan. In 1987, the domestic uranium industry supplied 49% of the U.S. uranium demand and today uranium producers are on track to supply less than 2% of the U.S. demand. What was once a robust industry has been adversely affected by the unfair tactics of state-sponsored entities to undercut uranium prices, such as state subsidies.

Uranium is a critical component to ensure a global nuclear deterrent, as it powers our Navy and provides fuel for our nuclear program. The decline in domestic production of uranium poses a grave threat to our national security. The U.S., and Wyoming in particular, have abundant uranium resources capable of supplying our defense and commercial needs for decades. It is alarming that our uranium needs for national security are being met by state actors competing with the U.S. for geopolitical influence and commercial advantage, although all of the necessary resources are within our borders.

Wyoming has considerable uranium reserves that would help the country meet its national-defense requirements. Wyoming's favorable regulatory environment for businesses poises the state to stand ready to ensure that domestic uranium alone is used for our defense purposes. For every 1 million pounds of uranium produced in Wyoming, around 55 direct employment jobs and 30 contractor jobs are created. Despite producing only 2 million pounds of uranium in 2016, the uranium mining industry paid $4.12 million in ad valorem taxes and $2.61 million in severance taxes to the state. Wyoming stands ready with the resources and infrastructure to increase production and aid the economy and national security. A quota that requires domestic uranium producers to meet 25% of the country's uranium demand and a "Buy American" policy for federal agencies using uranium is recommended to remediate the dire situation.

South Texas Project (STP) Nuclear Operating Company

STP Nuclear Operating Company is opposed to any remedies that may arise from the Department's Section 232 investigation into uranium imports. Uranium imports used for electricity production do not pose a threat to our national security and STP does not support any use of tariffs or quotas that may be proposed. Any governmental restrictions enacted on the uranium supply chain will have a negative impact on the U.S. nuclear power industry.

STP is a non-fleet nuclear operating company with two electrical generating units operating in the extremely competitive Texas electric power market, therefor controlling production cost is crucial to STP's business strategy. STP sources uranium through a competitive bid process in order to ensure the lowest cost for nuclear fuel is obtained, as well as to maintain transparency in the bid evaluation process. STP provides reliable, base-load, emission free electricity. It also plays an important role in communities by providing competitive jobs and economic stimulus. STP is the largest taxpayer in Matagorda County, Texas.

Any additional cost impact can have a significant adverse effect on the financial viability of STP given the current electricity market in Texas. Possible cost impacts associated with remedies from Section 232 include additional nuclear power plant closures, which would be detrimental to national security (grid reliability, diversity of electricity sources) and the environment (carbon-free emissions).

STP has observed that U.S. uranium production has declined because some U.S. producers have purchased uranium from the spot market to fill contracts instead of producing uranium from their own mines. An example of this involves one of the Section 232 claimants who reportedly sold 780,000 pounds of uranium under contract in 2017. Only 261,000 pounds of uranium originated from its U.S. mine production and the remaining amount, 67%, was purchased on the open spot market. The claimant states that their mine is capable of producing up to 1 million pounds of uranium per year. The claimant's business decision to forego producing its uranium from its US mine does equate to a national security concern because production capability exists.

STP supports the position to find solutions that enable a cost-competitive, domestic nuclear fuel supply chain. The Section 232 process is not the method to do so. Even one nuclear power plant closure will result in more lost jobs than the number of jobs employed by the entire U.S. uranium mining industry.

Sweetwater County, Wyoming

The Sweetwater County, Wyoming's Board of County Commissioners voices its support for any action taken resulting from the Section 232 investigation into uranium. The Ur-Energy Incorporated Lost Creek ISR Uranium Facility is located in Sweetwater County, Wyoming. Ur-Energy is one of the Petitioners of the investigation and the Board of County Commissioners in Sweetwater County recognizes Ur-Energy's importance to the economic base there. Lost Creek Uranium production adds approximately $14 million annually to the assessed valuation there and contributes an annual payroll of approximately $5.5 million. Sweetwater County supports a quota that will reserve 25% of the U.S. market for American miners.

U.S. dependence on foreign uranium supplies weakens our national defense, threatens our energy independence and weakens our economies. For defense purposes, the U.S. military must fulfill its uranium needs from domestic uranium supplies and these supplies are diminishing. As Canadian inventories continue to be reduced for similar reasons as U.S. inventories, dependence on Russian supplies will continue to increase. State owned and subsidized enterprises, within Russia and its allies, currently provide 32-38% of the current U.S. uranium demand while U.S. production is minimal.

Uranium mining contributes millions of dollars in severance and ad valorem taxes annually within Sweetwater County and the State of Wyoming. These tax dollars provide a tax base that plays a role in diversifying state and local economies. Wyoming uranium delivers high quality jobs and public services. If action is not taken, unregulated, foreign uranium supplies will continue to dominate the uranium markets. The Wyoming uranium industry will continue to decline from a level that once employed thousands of workers, to one that now employs around 245.

Texas Mining and Reclamation Association (TMRA)

The Texas Mining and Reclamation Association voices its support for action taken through the Department's Section 232 investigation into the uranium industry. TMRA is a non-profit statewide trade organization consisting of more than 150 members including producers of coal, industrial minerals and uranium as well as electricity generation utilities, support service industries and individual members.

U.S. national and energy security erode simultaneously as our domestic uranium industry erodes. As the world's largest consumer of uranium, it is unacceptable that in 2017 the U.S. produced only 5% of the uranium needed to supply 20% of the nation's electricity. As recently as 1987, U.S. production supplied 49% of the national nuclear fuel requirements used to produce the carbon free base load electricity from nuclear power. The lack of U.S. uranium production is not due to a lack of resources of uranium- the U.S. has an abundance of uranium resources capable of supplying both defense and commercial needs for decades to come.

Uranium is critical for our defense needs and laws dictate that uranium for these purposes must originate from domestic production sources. Although the Department of Energy maintains a supply of uranium to meet defense needs, the supply is not unlimited and additional uranium of U.S. origin will eventually be required. There is concern that when the need for more arises, our domestic mines will be unable to meet supply demands in a timely manner with no alternative for supply. This is a clear issue of national security and justification for action to be taken from the Section 232 investigation into uranium.

Uranium Energy Corp

Uranium Energy Corp. asserts its support for the proposal offered by the Petitioners on the basis that "the excessive amount of subsidized foreign uranium being imported into the U.S. has clearly displaced domestic supply and created a critical national security threat." The excessive amount of subsidized foreign uranium being imported into the U.S. has clearly displaced domestic supply and created a critical national security threat. The DOC should take immediate steps to curtail the excessive amounts of price-insensitive uranium supply from state-owned entities and develop a comprehensive remedy to revitalize the U.S. mining industry. We believe maintaining a vibrant U.S. uranium mining sector is critical, both to protecting U.S. security and creating U.S. jobs.

UEC is a publicly traded United States uranium producer listed on the NYSE American stock exchange with the ticker symbol UEC and the corporate headquarters are in Corpus Christi, Texas. As an independent, 100% unhedged U.S. uranium company, UEC has a portfolio of low-cost, fully permitted in-situ recovery (ISR) projects in South Texas and the Powder River Basin of Wyoming. With these U.S. projects and the fully licensed state of the art Hobson Processing facility, UEC has a baseline potential production profile of 4 million pounds per year, with room to expand. They also have other U.S. projects in Arizona, Colorado, New Mexico and Texas that they would be able to develop with prices that allow further investment to generate return for shareholders. IN 2011, UEC adopted a strategic plan to align operations in response to a weak uranium market and subsequently curtailed uranium production operations in 2013. While UEC is not producing uranium in the current market environment, they believe production could commence again within 6 months with prices at levels that are economically logical.

While UEC understands the remedy proposed by the petitioners will result in additional costs for the U.S. utility industry, the proposal would result in no more than a 1.2% increase in average wholesale electricity prices. They consider this a relatively small cost to bear to protect a strategic part of the supply chain for the world's largest reactor fleet. However, while they view the petitioners proposed remedy as one possible avenue to provide relief to the U.S. uranium producer, they also believe other national remedies could be designed, if necessary, to both invigorate the U.S. uranium production sector while protecting the nuclear generation sector. They encourage the DOC to develop a plan that considers the costs, risks and benefits of various options to protect both the U.S. uranium and utility industries.

Uranium Producers of America

Uranium Producers of America support initiation of an investigation Under Section 232 and actions to remedy influx of imports. UPA is a national trade association representing the domestic uranium mining and conversion industries. UPA's members conduct uranium exploration, development and mining operations in Arizona, Colorado, Nebraska, New Mexico, Texas, Utah and Wyoming. UPA strongly believes that the current market imbalance and state of domestic uranium industry clearly warrant the administration to take swift action to ensure there is a viable domestic uranium industry.

UPA is worried about the current state of the uranium industry because America's domestic production has been sharp decline since America was the world's top uranium producer in the 1980's. They are extremely worried about the national security risk of importing uranium from Russia and Russian influence countries like Kazakhstan and Uzbekistan. UPA is concerned with domestic uranium production being down 55% from 2016 to 2017, exploration was down 74% from 2016 to 2017 and how in 2017 the sole uranium conversion facility suspended operations. In addition UPA is worried about the declining workforce in the uranium industry as only 400 employees were employed in the entire US Uranium industry in 2017. This has created a decline in expertise and a downsizing in staffing.

Uranium imports are shifting from allies to state owned enterprises poses a national security risk. Historically, Uranium is imported from allies such as Canada and Australia, but in recent years production in those countries has fallen due to cheaper rates from state run uranium companies. UPA believes that without government intervention, the situation for domestic producers is only expected to worsen. This is mainly a result of the expiration of the Russian Suspension Agreement in 2020, this agreement limited the amount of uranium Russia can export to the United States. Another emerging concern of UPA, is the expansion of Chinese state owned entities expanding uranium production and enriching. UPA believes that expanding uranium imports would further displace uranium domestic production.

UPA believes that the uranium business is long-term and the current short term strategy of importing low-cost uranium from foreign countries exposes the United States to national security risks. UPA realizes that the current supply chain of the Uranium industry is not viable. UPA fully supports the petitioners and actions that would protect American uranium production from foreign suppliers. They believe if the current strategy of the domestic uranium industry were to continue the US would be exposed to significant national security and energy security risk.

URENCO Enrichment Company

On behalf of URENCO Enrichment Company and URENCO Inc. (UEC), they oppose the DOC's investigation into uranium imports, but understands the reasoning behind the investigation and urges the DOC to weigh the options carefully. UEC is a multinational supplier of enrichment services that operates processing plants in the United Kingdom, Germany and the Netherlands. UEC is one of the largest importers of uranium to the United States. UEC has the important role in securing a reliable supply of nuclear fuels to U.S. utilities. UEC has been a reliable and responsible supplier of US Utilities for decades and has a substantial portfolio of long-term contract commitments.

UEC lists three main reasons why limits on American uranium imports from allied nations should not be imposed. The first is that nuclear power plants are a critical element to the energy infrastructure of the United States. As a stable source of power, nuclear power plants contribute to a secure energy grid. Second, imports from allied nations are indispensable to the continued operation of nuclear power plants. Lastly, imports of uranium from countries allied with the US through NATO and mutual defense partnerships strengthen US national security and should be excluded from any remedy proposed in the investigation.

UEC is worried about the potential repercussions of remedies on nuclear power plants. They noted that the US is the largest producer of nuclear power with 99 reactors that supply 20% of electricity in America. UEC believes that these power plants are integral for national security and asks that the DOC please take into consideration the entire sector as they believe the findings of this investigation will drastically effect nuclear power plants.

UEC's main concern with the 232 uranium investigation is that any remedy would be broad and inadvertently harm our allies in targeting imports from the state sponsored uranium companies. If remedies are imposed UEC supports specific sanctions to be placed on the state sponsored uranium companies and not on allies such as the UK, Germany and the Netherlands. UEC strongly believes there is no benefit to American national security from stopping uranium imports from these allied counties. UEC also believes that the uranium industry is extremely complex and it is difficult to fully comprehend the effects of any remedies imposed as a direct result of the 232 Investigation.

URENCO USA

URENCO USA (UUSA) supports action taken by the Uranium 232 investigation that would bolster the US Uranium production up. However, they support remedies that are narrowly tailored to Russia and do not impact uranium production of allied nations. UUSA is a corporate parent of Louisiana Energy Services which is the licensee and operator of the only commercial facility in the US that is producing enriched Uranium to fuel civil nuclear power plants. This facility is currently capable of meeting roughly one third of annual demand for uranium enrichment services in the US and also exports enriched uranium globally.

UUSA main concern with the current status of the domestic uranium industry is the dumping of uranium by Russian state sponsored companies. This is not a new problem for UUSA as they cited an antidumping duty investigation from 1991 to determine whether uranium from the USSR were being sold to the US for less than fair value. UUSA discusses how this problem still exists today as Russian producers appear to have the ability to undercut US producers, Russian State Nuclear Energy Corporation (ROSATOM) has claimed that is able to undercut by 30% of world market uranium prices.

Another issue UUSA cites is that they cannot compete in Russia because Russia's uranium market is closed to foreign competition. ROSATOM supplies 100% of enrichment needs to nuclear power plants in Russia and the majority to Eastern European states that were formally the USSR. UUSA believes that it is wrong for ROSATOM to benefit off of free markets like the United States and supply a closed market in much of Eastern Europe and all of Russia. Similarly UUSA continues to monitor the actions of the Chinese state sponsored competitor in the area of uranium enrichment services and the relative openness of the Chinese industry.

UUSA strongly believes that any potential remedies imposed as a result of this section 232 investigation could have drastic effects on the complex US and global nuclear fuel cycles and must be subject to extensive consideration and analysis. UUSA believes any remedies must be narrowly targeted and should not impose restrictions on US allies, whose imports play a key role ensuring stable supplier for US nuclear energy and protecting national security.

Utah Mining Association

The Utah Mining Association voices its full support on section 232 investigation of imports of uranium because they feel that the US is too dependent on foreign sources of uranium, posing an unacceptable threat to national security. UMA is a 103 year old, non-profit, non-partisan trade association representing the interests of miners in Utah. They represent every facet of the mining industry.

UMA believe that the US uranium industry is at risk because the US is the world largest consumer of uranium and the domestic uranium industry has shrunk to the point that it is a pressing security concern. The main cause of this security threat, according to UMA, is uranium and nuclear fuel imported from state subsidized foreign entities. In 1987, US production supplied 49% of our national requirements while last year US producers supplied less than 2%. UMA is extremely concerned with the rise in production of US geopolitical rivals like Russia and China, while uranium supplies of American allies like Canada and Australia are diminishing. The anti-competitive practices of state owned and state subsidized entities are putting US producers at an enormous disadvantage.

UMA strongly believes that the proposed remedies are sensible and achievable and support the 25% quota to “buy American.” UMA states that this remedy will have little impact on US utilities and their customers, but will have tremendous impact on US uranium producers where thousands of jobs will be created in their sector. The benefit of these jobs will be in America’s rural communities where their taxes will go to supporting rural schools and hospitals.

The Village of Milan – New Mexico

The Village of Milan (New Mexico) expresses its support for the DOC's 232 investigation of the impact foreign uranium imports have on national security. The current high level of uranium imports poses a threat to national security from geopolitical rivals such as Russia, Uzbekistan, and increasingly China. Uranium production from U.S. allies, including Canada and Australia, which have historically supplied significant uranium to the U.S., is also in decline with the vacuum likely filled by Russia, China and their allies. This geopolitical tension demonstrates a clear threat to national security.

According to the Village of Milan, unfair trade practices by U.S. rivals have caused the imbalance and harmed their uranium industry which was once a major economic driver for the community. Reviving the industry in the Village of Milan would create hundreds of jobs and generate millions of dollars in tax revenues and employment income. The Village of Millan urges for the implementation of a quota that reserves 25% of the U.S. market for domestic producers and a policy that requires government agencies and utilities to purchase U.S. uranium.

Vimy Resource Limited

VIMY opposes the remedy proposed by the 232 investigation on Imports of Uranium as a National Security threat. VIMY is an Australian uranium producer that is traded on the Australian Stock exchange and is 20% owned by the resource capital fund located out of Denver, Colorado. VIMY is extremely concerned with proposed 25% domestic quota on the total import amount. VIMY challenges many points in the petition including that Russia is influencing the market with cheap uranium and that this represents a national security risk.

Concerning Russia VIMY believes that Russia is effecting the markets less than what the petition states. VIMY asserts that Russia has no influence on uranium production in Uzbekistan and only 37% control of Kazakhstan. According to VIMY, the two largest mines in Kazakhstan are joint ventures between non-Russian companies. VIMY believes strongly that the petition fails to substantiate the case for Russian influence may be able to significantly affect uranium mining or uranium mining policy in Kazakhstan and Uzbekistan.

VIMY also disputes the claim that Russia is flooding the market with cheap uranium because VIMY asserts that the import statistics released from EIA do not support the thesis of Russia flooding the market. VIMY cites that since the Fukushima disaster, imports from Russia, Kazakhstan, and Uzbekistan to the US has actually falling from 40% to 32%. The offset of the decline in imports from Asia have been offset by increasing imports from Canada.

VIMY strongly believes that the current state of US uranium production is not a national security threat. VIMY states that the Navy has a large stockpiles of Highly Enriched Uranium, and believes that a temporary cessation of domestic supply would be unlikely to disrupt any operations or have any noticeable adverse impact. VIMY also believes that there is no serious national security threat when it comes to nuclear arms because of existing tritium stockpiles. According to VIMY even if uranium production were to cease for a few years entirely; existing tritium stocks and recycling of older materials will likely meet any immediate demands.

VIMY rejects the proposed remedies because they feel it is not necessary to impose a marketing distorting quota system that will penalize both reliable foreign suppliers and US nuclear utilities. They denounce the petitioners assentation’s that a quota will not affect the price to US utility companies. According to VIMY the price will double and run the risk of nuclear reactor closing.

Western Uranium Corporation (Western)

Western Uranium Corporation (Western) supports the Section 232 investigation into uranium imports and any action that may be taken due to the investigation in order to revive the uranium mining industry. As a near term producer of uranium, Western has experienced first hand the negative effects that uranium imports from state owned enterprises in Russia, Kazakhstan, and Uzbekistan have caused. Between 1987 and 2017, U.S. uranium requirements fulfilled by U.S. uranium production declined from 49% to 5%. Imports from these state owned enterprises now constitute 33% of the U.S. demand for uranium.

Due to military and energy applications, uranium is an indisputably critical material and the lack of its production in the U.S. poses a threat to national security. If action is not taken, the United States mining, milling, and processing infrastructure will further wither and impair the national security. It is Western's view that an entirely free market is no longer effective as market forces are not able to balance markets due to the anti-competitive practices of state owned and state subsidized entities.

Western believes that U.S. Government intervention is necessary to fix the issue and it supports the proposed solution of reserving 25% of the U.S. nuclear market for U.S. uranium production. Doing so would create jobs and provide rational market prices and quantities for a period of time sufficient to overcome decades of disadvantage.

Wyoming State Treasurer – Mark Gordon

The Wyoming State Treasurer – Mark Gordon – expresses support the DOC's Section 232 investigation into the impact uranium imports have on national security. The State believes its domestic mining industry cannot compete against imports from state-sponsored enterprises in Russia, and has seriously harmed the economic well-being of Wyoming's communities.

Wyoming is one of America's leaders in uranium production and there are five companies actively operating uranium mines in our State. This industry is vital for the economic well-being of communities and the drop in active mining in Wyoming has had a significant impact on many cities and towns. The number of Wyomingites employed by the uranium industry today is less than half of the number employed in 2013. But it is not only Wyoming's livelihood that is threatened. Nothing less than U.S. national security is at stake.

With mines in allied countries such as Canada and Australia shutting down, the U.S. is on its way to complete dependence on Russia and its allies. One has only to look at Russia's geopolitical ambitions and its record to see an unstable, unreliable energy supplier willing to wield its energy resources as a tool to achieve its economic and geopolitical goals. Given that nuclear power is the source of 20 percent of America's electricity, dependence on Russia for uranium to fuel our nuclear power plants is shortsighted and dangerous. Furthermore, international treaties mandate that domestic uranium power U.S. nuclear ships and submarines. That will be impossible without a robust domestic uranium industry, and, if there were not U.S. plants to handle the needed supply, the result would be a profound and direct threat to national security.

The uranium mining industry in Wyoming would welcome the opportunity to compete in a fair global marketplace. Committed to worker safety and environmental safeguards, the industry would flourish in an open market. But with unfriendly governments supporting Russian, Kazakh, Uzbek and, increasingly, Chinese industries, the U.S. industry has no chance. The Wyoming State Treasurer urges the administration to quickly conduct this crucial investigation and take action to help Wyoming's and the country's uranium mining industry.

The general public overarchingly supported the Uranium 232 investigation in their public comments. Notably, a significant number of government officials from Nucla, Colorado expressed strong approval for a 232 remedy. Public comments generally supported the purposed import restrictions on the basis of improved national security, economic wellbeing, and competitiveness of the US uranium industry.

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22 August 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Subject: Section 232 National Security Investigation of Uranium Imports

Dear Michael Vaccaro and Office Staff,

The investigation into uranium imports is important to the people of America in several ways, both economically and potentially existentially, and, as such, I thank the Commerce Department, and your office, for agreeing to carry it out.

The biggest concern surrounding the importation of uranium centers on what it's doing to our industry here at home. Because of unfair trade practices, including heavy subsidization, on the part of our strategic and economic rivals, the U.S. uranium industry has been on the decline for several years. Last year, U.S. uranium production fulfilled less than 4% of U.S. demand – this year it is on track to supply less than 2%.

This is not a function of a free market in uranium; as nuclear energy increasingly looks to be a valid, safe and stable source of clean energy capable of eventually replacing fossil fuels while still meeting our energy needs without interruption, more uranium will be needed to fuel the reactors. The United States is currently the world's largest consumer of uranium. And yet, despite having great reserves of it here, we are heavily dependent on imported uranium to fill that demand. How did we manage to get in that situation?

The fact is there is NOT a free global market in uranium. Several of the world's largest uranium producers – Russia, Kazakhstan, Uzbekistan and China – have nationalized their industries, and subsidized them heavily enough to be able to control the market. The pressure this places on American uranium miners and processors is enormous, and one they cannot bear, resulting in the contraction we see within our domestic industry. This is a problem that is getting worse and worse every year.

In addition to requesting the investigation and remedial action on part of the administration to correct it, the 232 petition also called for the investigation to be expedited, so that the bleeding can be stopped. I would agree and echo that request.

Thank you again for responding to this important national concern.

Sincerely,

Cimmaron Alexander

Cimmaron Alexander

PO 223

Norwood, CO 81423

September 07, 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093,
Washington, DC 20230

RE: Comments on Section 232 National Security Investigation of Imports of Uranium

Dear Mr. Vaccaro,

All Texas Location & Lease Services, Inc. would like to thank the Department of Commerce for the opportunity to respond to the "Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Uranium" published in the Federal Register on July 18, 2018.

For over 20years, All Texas Location & Lease Services, Inc. has provided a multitude of services to the uranium industry, ranging from bit re-tipping, drilling, and land clearing, to lease crew services, welding and custom fabrication of parts and industry related field equipment. Over the past 6 years, this work has drastically declined due to the lack of exploration and development drilling in the industry.

The US uranium industry has suffered great harm and our national security is threatened as a result of excessive imports of foreign uranium. The United States over reliance on price insensitive uranium from countries like Russia, Kazakhstan and Uzbekistan with their state-owned and funded companies,has displaced US production and led to a severe decline in the industry. As a service provider to the US uranium industry, this has also hurt our business.

We encourage the Department of Commerce and President Trump to take actions that are supportive of the uranium industry and protect our national security and energy interests that are dependent on this vital industry.

Sincerely,

To: Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Attn: Michael Vaccaro, Acting Director Office of Technology Evaluation

Date: August 28, 2018

Re: National Security Investigation on Uranium Imports

Dear Mr. Vaccaro:

I support the conduct of an investigation into the consequences of uranium imports, and request that the President and the Commerce Secretary adopt appropriate actions to protect our domestic uranium industry and preserve our national and energy security.

The bottom line is that uranium is a critical national resource, needed for civilian and military purposes. It is the fuel of the future, the feedstock required for the nuclear power plants which will be the backbone of our energy infrastructure as we transition away from fossil fuels. It is also the fuel that runs the most powerful ships in our navy and that provides our nuclear arsenal, which has kept the peace for over half a century.

Russia, and others, have actively attacked our uranium industry by subsidizing their state-run industries to unrealistic levels. By doing so, they have displaced much of the American uranium industry in the market, even the domestic energy market. U.S. uranium now supplies between 2-4% of our domestic demand while Russian uranium supplies nearly a third. This disparity is only growing.

We should NOT be dependent on ANY country for such a critical resource but fostering dependence on Russia for it is particularly disturbing. The Russians have acted, at best, unfriendly, at worst, adversarial, toward the U.S. and the west for the better part of two decades, and the relationship is not improving. We imposed sanctions on them for several international transgressions, not the least of which was the killing of a former spy in Great Britain. In response to our sanctions, they have threatened economic counter-measures, and in March of this year Russian hackers were reported to have broken into critical energy infrastructure, including nuclear plants. They clearly covet being in a position where we rely on them for nuclear fuel, and once they have that control, does anyone really believe they will not hold us hostage for it, through orchestrated supply disruptions or extortive price increases?

The Commerce Department has a responsibility to ensure free and fair international trade, and to put America's commercial and concomitant security needs first. This investigation is a first step but must be followed up with appropriate action.

Respectfully,

Shelley Archer

Shelley Archer
Box 153
Nucla, CO
81424

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August 21, 2018

Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Acting Director of the Office of Technology Evaluation,

It's come to my attention that there's an opportunity to spur more production of US energy. Anything we can do to produce more energy at home than relying on any foreign government is worth doing in my opinion. As it pertains to this letter, I want your office to help spur additional production of uranium by enacting a 25% quota. The benefits of this are three-fold.

First, it inures us against Russia and other countries who currently supply most of the uranium we use. Russia has its fingers in enough American business to make anyone feel uncomfortable. To think they may have possible power over our electricity in any way shape or form is a terrible feeling.

Second, we produce more carbon-free energy this way. Uranium leads to nuclear power generation which has no carbon emissions whatsoever. In the fight against climate change, this can only be viewed as a positive. No matter where you stand on the climate change debate, producing clean energy is a good thing.

Third, more domestic production means more jobs, means more economic activity, means less money going overseas. Our economy is a powerhouse, and if we want to keep it growing, we need to find opportunities. This is a good one, and it should be pursued with vigor. I hope your office gives it the rubber stamp of approval it deserves.

With gratitude and respect,

John Brackney
6038 S. Canton St
Centennial, CO 80121

August 22, 2018

Section 232 National Security Investigation of Imports of Uranium

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Mr. Vaccaro,

It is without hesitation, but a great deal of concern, that I write to offer support for the investigation being conducted by the Commerce Department on the national security threat posed by uranium imports. I also support the recommended remedies put forth by some of the leaders of America's uranium industry, which, if adopted, would serve to help preserve domestic uranium production.

This critical industry has shrunk in the U.S. over the past 10 years because of targeted actions by international competitors seeking strategic and economic advantage over America. We're at that point now—our national security is at risk. The countries at fault – Russia, Uzbekistan, Kazakhstan, and more recently China – have purposely wrenched control of the global uranium market by heavily subsiding their own, government-run industries, until American producers cannot hope to compete. The predictable result has been the shrinking of American uranium production, so that our country is now mostly dependent on this strategic commodity on nations that desperately want strategic and/or commercial leverage over us. It also means that soon we may not have a domestic uranium industry capable of supplying enough uranium to meet our defense needs.

The sobering reality is that fully one-third – and soon likely more – of U.S. uranium demand is being met by imports from Russia, Uzbekistan and Kazakhstan, where uranium production is state-owned and state-subsidized. Domestic production is shrinking proportionally, as these imports supplant American supplies. At the current rate, domestic uranium production could virtually disappear within a span of a few years. This would leave us at the mercy of foreign suppliers of a fuel source that makes up 20% of our overall electrical generation, a percentage that is only going to increase in the years to come, as clean, sustainable nuclear energy begins to replace fossil fuels. We are putting ourselves in the very same position we did in the 1970's with OPEC and the oil crunch. Only instead of gas lines, we could be facing blackouts.

But perhaps even more disturbing than the thought of direct impact on national security is the concerted effort to decimate the U.S. uranium industry. International treaties stipulate that any uranium used in our defense programs be sourced domestically – i.e., we cannot import uranium for use in nuclear weapons or for the reactors in our nuclear-powered navy. If the Russians and others succeed in immolating our uranium industry, where will we get the fuel and fissile material needed to keep our country safe? This ought to be a source of great concern to all Americans.

Thank you to the Commerce Department for agreeing to conduct this crucial investigation, and I fervently hope that it will be concluded shortly, and effective remedies put in place shortly thereafter, before it is too late.

Sincerely,

August 24, 2018

Colorado Agricultural Aviation Association

Mr. Michael Vaccaro, Acting Director
Office of Technology Evaluation
Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Mr. Vaccaro:

I believe the proposal to increase the amount of uranium produced to a minimum of 25% is a good idea. Russia and China compete with the U.S. for geopolitical influence and commercial advantage. This is obvious. They also have a long record of utilizing state-owned energy industries as tools of foreign policy.

U.S.-Russia relations are on the decline. Earlier in 2018, the Russian Legislature gave Vladimir Putin authority to halt exports of uranium to the U.S. in response to U.S. sanctions. Since the U.S. has placed additional sanctions on Russia in response to the use of a nerve agent to kill a former spy in England, Russia has threatened retaliation.

It is dangerous for the U.S. to become dependent on this geopolitical rival for our uranium and nuclear fuel. This is especially true since the U.S. government is likely to run out of uranium for certain non-defense priority programs as early as 2025, and low-enriched uranium (LEU) for tritium production as soon as 2027. Further to this point, the National Defense Authorization Act calls for the construction of additional naval vessels and the Navy is planning to extend the life of other nuclear-powered vessels previously slated for decommissioning, all which will consume more uranium.

We need to ensure that we have healthy uranium and nuclear fuel industries that are able to respond to these critical missions. That's why this quota is necessary and good.

Thank you,

Jessica Freeman

Jessica Freeman
Colorado Agricultural Aviation Association
16489 Burghley Ct.
Platteville, CO 80651

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CENTENNIAL INSTITUTE
COLORADO CHRISTIAN UNIVERSITY
FAITH • FAMILY • FREEDOM • FUTURE

August 27, 2018

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

RE: Section 232 National Security Investigation of Imports of Uranium

Dear Mr. Vaccaro,

On behalf of the Centennial Institute, a public policy think-tank affiliated with Colorado Christian University in Denver, CO, I wish to offer support for the investigation into the national security implications of uranium imports which the Department of Commerce has initiated, as well as for the proposed remedial policies which were offered as part of the Section 232 Petition requesting the investigation. We feel that these are necessary to preserve the energy, economic, and even national security of the United States in face of what amounts to an assault on the free market, and an economic attack on our country, by certain foreign political entities.

Over the course of the past decade, the governments of Russia, Uzbekistan, and Kazakhstan have, through oligopolistic means, undermined the American uranium industry, and propelled their own state-run uranium industries into occupying an ever-increasing share of the domestic uranium market, in anticipation of the expiration of the Russian suspension Agreement. Breaking down the recent figures, we find that imports of uranium from these three countries are now meeting fully a third of U.S. demand, while our own production fulfills less than 4 percent, and is on track to meet less than 2 percent this year. Indeed, the Energy Information Agency reports that American uranium production in the initial quarter of 2018 was half of what it was a year earlier, and in fact was marked at the lowest level since production figures were first reported in 1948. The scenario promises to get worse as the Suspension Agreement nears expiration, and as China appears poised to engage in similar tactics.

This has not been the doing of the free market; instead it has occurred due to a deliberate interruption of the free marketplace conducted by foreign political forces with the intent to gravely undermine the U.S. and other western uranium industries, by subsidizing to surrealistic levels their own state-run uranium industries. This market disparity has resulted in ever increasing levels of importation and threatens the dismantling of our domestic uranium industry, upon which we depend for the provision of uranium for the upgrading of our nuclear deterrent and fuel for our nuclear-powered aircraft carriers and submarines. This is not dissimilar, in effect, to what OPEC did to us in the 1970's.

We believe it should be public policy of the United State to break this cycle that has been aimed towards us and our western allies as an act of economic warfare. We therefore support the imposition of an import quota on uranium which secures 25 percent of the domestic market for American producers, and a requirement that federal government agencies procure uranium from American producers. This is a much more prudent approach than establishing price controls or imposing tariffs, one which will decrease imports and increase domestic supply while punishing those foreign actors who would seek to extort us through surrealistic market distortion.

8/28/2018

Michael Vaccaro - Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

RE: Section 232 National Security Investigation of Uranium Imports

Mr. Vaccaro and Other Interested Parties;

We are pleased to learn of the Department of Commerce's investigation into the impacts on national security from uranium imports. We believe this is a serious issue facing America and are willing to lend our support for the proposed remedies that were offered as part of the 232 Petition. We feel those remedies will accomplish the goal of preserving an American uranium sector and enhancing our nation's security and independence, while minimizing any economic consequences to American utilities and/or consumers.

We stand behind Energy Fuels and Ur-Energy, the two Denver, Colorado headquartered companies that together supplied over half of the total U.S. uranium production in 2017, and stand out as the industry's leaders. In January, the two companies jointly submitted a Section 232 Petition for Redress, asking for an investigation into the impacts on national security from the import of uranium, especially from countries that are obvious geopolitical competitors, if not in fact adversaries, and who flout the principles of free trade at will in a deliberate attempt to unfairly gain an outsized share of the U.S. nuclear fuel market. Their objective may be simply gaining commercial advantage, but the effect has been to drive U.S. producers to the brink of disaster and make our country largely dependent on these nations for our nuclear reactor fuel.

Although we are mainly talking about uranium for civil energy needs, this has serious defense implications as well; by law, any uranium used for defense purposes (nuclear weapons, tritium production, fuel for nuclear submarines, etc.) must come from domestic sources. If our domestic industry is eliminated due to economic pressure exerted from a foreign government, we will not have access to uranium for those critical purposes.

The remedies offered in the petition include an import quota on uranium that would ensure a market exists for American miners regardless of what unfair trade tactics other nations might try. An import quota will help stabilize our domestic industry and will not have the negative impacts that heavy tariffs and other protectionist measures usually produce. Specifically, it will not financially harm U.S. nuclear power plants. While there are some nuclear plants in the U.S. that are struggling right now, it is largely for reasons unrelated to the cost of fuel, such as subsidization of wind energy and the historically low price of natural gas. An import quota is not expected to increase the cost of uranium by a significant amount.

Dependence on any foreign nation for any of our energy needs is unwise; heavy dependence on countries that are not our allies is dangerous and poses a clear threat to our security. Therefore, we reiterate our support for the investigation, and specifically for the proposed remedies.

Signed, Richard A Crews

970 - 864 - 7381

Mr. Michael Vaccaro
Office of Technology Evaluation
U.S. Department of Commerce
1401 Constitution Avenue NW, Room #1093

Dear Director Michael Vaccaro,

I'm sending you this letter because I believe the United States is threatened by our dependence on foreign uranium. We rely on uranium for a steady energy output that allows us to compensate for less reliable energy sources. If our uranium is threatened our energy grid is as well. If our energy grid is threatened our entire way of life is threatened. What makes this vulnerability a threat is the countries which we are relying on have unfriendly policies towards America. These countries include China, Russia and Kazakhstan. These countries undercut American uranium by having their government own or fund their uranium industry. Since the US rightfully prescribes to free trade, we don't financially support our uranium industry. This causes US uranium to have a higher market cost when compared to the uranium coming from China, Russia and Kazakhstan. This is a blatant attempt by foreign governments to attack our uranium industry and jeopardize our economy and our energy grid.

The threat has already come to fruition in the American uranium trade. Some of the largest uranium producers have had to lay off up to 50% of their entire work force just to stay in business. These companies are operating at capacities as low as 9% because there is a falling demand for American uranium. These jobs are hard to replace because they require an average high school degree but pay wages comparable to jobs that require 4-year degrees. The issue has been highlighted here in western Colorado due to a company putting off mine expansions because of reduced demand.

Western Colorado was built on mining and even left its mark on history by being the hub for mining and milling for the 'Manhattan Project'. The history goes back even further, before Colorado was even a state, miners flocked here to make a living on hard work and honesty. This is the mindset and the industry that shaped the entire west. With this investigation we can revitalize, Colorado, the West, the economy, and our energy independence.

Respectfully,

Don Colcord
PO 457
Nucla 81424p

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Mr. Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

August 21, 2018

Mr. Vaccaro:

I'm writing to you because I'm concerned about the safety of our power grid, notably as it pertains to the nuclear sector. The uranium sector has contracted drastically, and we are now dependent upon Russia, Kazakhstan, Uzbekistan, and China for our needs. Given the tumultuous global environment, it seems foolhardy to place so many of our important eggs in these few baskets. This is an issue of national security.

Domestic production currently fulfills less than 4% of United States demand, while more than 1/3 comes from the countries named above. If this trend continues, that paltry 4% will continue to erode to the point where we will be fully beholden to foreign interests who I'm certain would love to have this much leverage of the United States in one of its key vulnerable areas.

That's why I think a proposed remedy of 25% quota reserved for US producers is not only good for American workers and American companies, but for our national security as well. Demanding that we put America first will ensure that should the winds of international politics change (which they can do swiftly), America is in a better position to handle it when it comes to nuclear energy production.

I don't mean to sound alarmist, but time is running out. And if we don't embolden this industry in the US, we might be faced with a crisis that we are unprepared to handle. I'm counting on you to make the right decision.

Thank you and God bless,

J. Cutter

53W. Cedar Ave #2
Denver, CO 80223

August 17, 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, D.C. 20230

Dear Mr. Vaccaro and OTE Staff:

As an American citizen, I am in favor of the U.S. Department of Commerce conducting an investigation into the impacts of uranium imports on national security. In fact, it amazes me somewhat that such a thing has not been done sooner, given how important uranium is strategically to our nation.
Despite having great and accessible reserves here on U.S. soil, we have steadily allowed ourselves to become more and more dependent on foreign countries for our uranium. Those countries happen to be Russia, Kazakhstan, and Uzbekistan, with China rapidly increasing their presence. None of these countries are what most reasonable people would consider an *"ally"* of the United States or the West; and yet they are the ones who, in large part through what amounts to concerted economic warfare, are in control of the uranium we need for nuclear power. Depending on *any* other nation for an element as strategically vital as uranium is a problem worth addressing and runs counter to our national security priorities. But to cede that control to these specific nations is particularly concerning.

U.S. uranium production fell to near-historic lows in 2017, and is on pace to decline this year to the lowest levels ever recorded. Imports from Russia, Kazakhstan, and Uzbekistan account now for more than one-third (1/3) of U.S. uranium demand. American-produced uranium accounts for not even four percent (4%), and when the numbers come in for 2018, we may find even that terrifying number dropping to less than two percent (2%). We are in this situation largely because those countries circumvent the free market by creating uranium industries that are fully owned and controlled by the government and subsidizing them to an extent that distorts the market so severely that American (and indeed other western) uranium producers are driven out. As the Russian Suspension Agreement, which limited importation of Russian uranium since 1992, nears expiration the pressure on American producers will be even greater. On top of all that, China is basically doing the same thing, and has even announced its intention to penetrate the American market.

It is unconscionable that the United States would allow the supply of a major strategic resource to be controlled by our geopolitical adversaries, especially when we have a domestic supply. We are the largest consumer of uranium in the world, and most of our zero-carbon electricity comes from nuclear power, which is most likely the future of clean energy; and yet we remain heavily dependent on imported uranium. This precarious and dangerous situation simply cannot be allowed to continue.

Cordially,

Nancy Domgaard

Nancy Domgaard

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August 17, 2018

Michael Vaccaro
Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Re: Uranium Import Investigation

Dear Mr. Vaccaro:

I am writing to submit comments in strong support of the investigation into the national security impacts of importing uranium into the United States from Russia, Kazakhstan and Uzbekistan. This is one issue which I feel really should serve to unite all Americans, regardless of party, ideology, or economic viewpoint. The cost of continuing as we are and ceding supply of our uranium to the Russians and Chinese is simply unacceptable.

There can be no question as to the importance of uranium to the national security of the United States. Not only is it used in the production of nuclear weapons, but it is an unsurpassed energy source. Many of our Navy's most important ships, aircraft carriers and submarines, are nuclear powered; and nuclear energy – fueled by uranium – accounts for about 20% of the electricity generated in the United States. Uranium is critical for the maintenance of our electrical infrastructure.

Moreover, uranium mining and its associated industries employs hundreds of workers, generates local tax revenue and, in many cases, is the economic hub of a local community. With all these benefits, and the scale of its importance to the nation, as a whole, it is extremely troubling to learn that because of Russia's leveraging of its state-owned uranium monopoly, it was able to distort the market badly enough to all but force American producers out of the game. American production of uranium is poised to reach and all-time low this year, with America providing just 2% of her own needs.

It is little wonder then that two of the nation's largest uranium producers filed a Sect. 232 petition calling for an investigation by your agency on the national security risks presented by this level of captive-market uranium importation. I join with them in hoping that the investigation can be expedited, and that the President may use his authority to adjust imports of this critical material, not simply to shore up the American economy, but to ensure her defense into the decades to come.

Yours Truly,

Jess Fulbright
PO 203
Nucla, CO 8424

August 24, 2018
Michael Vaccaro
Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
United States Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230.

To Mr. Michael Vaccaro,

I am writing to thank the Department of Commerce, your office, and all applicable agencies for agreeing to conduct a National Security Investigation of Uranium Imports, in accordance with the Section 232 Petition filed requesting the same. I ask that as you complete the investigation you incorporate the remedies proposed in the petition, as they are both reasonable and needed.

The proposed remedies include two principal components: A) an import quota that preserves 25 percent of the American uranium market for American producers; and B) a requirement that federal government agencies that use uranium buy it from American producers, not from foreign countries. This second part conforms to President Trump's "Buy American" policy. Both remedies are necessary to protect our uranium mines and processors from the overt economic attacks they are facing from state-run uranium producers in Russia and other countries, including China of late, many of whom are not exactly on the friendliest of terms with America and the West.

We do not have a whole lot of time to act on this. Based on current trends, American uranium producers may produce less than 2 percent of our uranium needs this year. This number has been steadily going down (it is half of what American producers supplied in 2017) while the amount of uranium being supplied to our country by Russia has grown. The current trajectory does not predict the survival of a healthy and stable U.S. uranium industry far into the future. The consequences to our national security, as well as our energy independence, are obvious. Uranium is a strategic mineral – we do not want to be in a position where we have to beg our "friends" in Russia and China for it when we need it in order to meet our energy needs. We certainly never want to be in a position where our defensive capabilities are compromised because of a lack of access to uranium, not when we have an ample supply of it here.

Thank you again for your participation in the investigation, and in advance for helping implement the needed remedies. This is not a mere free-trade issue; our global competitors have made quite sure there is not a free trade in uranium. This is not about industry protectionism... it is about salvaging a key strategic resource in the face of a deliberate economic attack.

Best,

Jasmine Gillaspy

28825 Cd road

Nucla, CO 81424

Mr. Michael Vaccaro
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington D.C. 20230

This letter is to encourage the investigation about our reliance on foreign uranium. Our reliance is a threat to national security and continues to hurt our economy. We can't let nations like Russia, China, and Uzbekistan dictate our energy policy and threaten our national energy grid. These nations have displayed less than friendly economic policies toward the US. Buy too much uranium from them practically hands our national security over to them. Additionally, their governments fund their uranium trade which unfairly undercuts American uranium. It's a dirty tactic that we have allowed to go on for too long. Our uranium industry must be kept strong for our protection and safety from physical threats. If our industry is too weak to produce uranium we will eventually be forced to rely on foreign nations for our defense uranium. This means our nations missile and naval defense systems could be damaged by Russia and China if they decide to stop trading their uranium.

Just as important as national security is well paying domestic jobs. We need to bring mining back to western Colorado. We were the hub for uranium production during the early and mid-19th century. It brought tax revenue, good jobs, and infrastructure to several counties on the Western Slope including Montrose, Delta, and Mesa Counties. The average mining salaries vary between $56,000 and $60,000 a year. That's 70% more than the average salary of an individual with a high school diploma. These salaries even compete with the average salary of individuals who have a four-year bachelor's degree. This investigation can bring back jobs to western Colorado that allow a single income to support an entire family. These are the job the region is in desperate need of.

I encourage you, Mr. Vaccaro, to conduct this investigation into the threats to our national security and economic wellbeing.

Signed,

Marjorie Haun-Storland
P.O. Box 335
La Sal, UT 84530

August 21, 2018

Michael Vaccaro
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230.

RE: Section 232 National Security Investigation of Uranium Imports

Dear Mr. Vaccaro;

As you are aware, uranium is not only a critically important contributor to our energy portfolio as the main fuel source for clean, sustainable nuclear power, and vital to the economic life of several communities in the United States, it is also an extremely important military resource, providing the key material for our nuclear deterrent, tritium for the improvement and upgrading of those weapons, and fuel for our nuclear powered carriers, submarines and cruisers. The remedies proposed in the petition calling for the national security investigation into the effect of imports of this crucial mineral will make sure that we will always have a domestic source for it, and not have to be reliant on countries that do not have our best interests at heart for this nuclear fuel.

Foreign reliance on uranium would be far more than simply an economic nuisance. Estimates have the U.S. most likely running out of our supply of uranium for certain non-defense related priority programs as soon as 2025. Even more frightening, we could run out of low-enriched uranium (LEU) for tritium production as early as 2027. If we continue on the track we are currently on, with Russia, and increasingly China, using aggressive anti-free-trade tactics to undercut the American uranium industry in a bid to overtake the U.S. market, we will not have a domestic industry capable of mining and processing uranium by that point. That means we will not only be dependent on Russia and China for nuclear fuel for our clean energy future, but find ourselves in the unenviable position of either renegotiating international treaties to allow our two most likely adversaries to supply us with LEU, or face the prospect of not being able to upgrade our nuclear arsenal – while Russia and China will have plenty of tritium available to boost their own nuclear weapons yields.

This threat to our industry, and ultimately to our national security, is ongoing. Part of the 232 Petition's request was to expedite the investigation so that recommendations could be implemented as soon as possible to limit any further damage being done. I see no reason that this request should not be granted, and the appropriate adjustments to our trade policy be made as quickly as possible.

Yours sincerely,

Rick Kettle
261 E 3rd road
Nucla, CO 81424

Mr. Michael Vaccaro, Acting Director
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Re: 232 National Security Investigation of Uranium Imports

Dear OTE Team:

Please accept this letter in support of the investigation into uranium imports, as requested by a Section 232 Petition earlier this year. The investigation will shed some much-needed light on the precarious situation the United States is in regarding the future of our uranium industry and our sourcing of this strategic mineral. There are proposed remedies included in the petition, and I believe these are appropriate, achieve important national objectives, and balance the need for corrective economic action with the principles of free trade and market economics.

The proposed remedies include an import quota on uranium and nuclear fuels, sequestering 25% of the American uranium market for access to American producers, and a requirement, in line with President Trump's "Buy American" policy, that U.S. government agencies only purchase uranium from American mines. These are the only logical and reasonable options going forward. Tariffs do more harm than good in the long run, especially to American consumers, and doing nothing clearly is not an option.

In response to claims that these are protectionist policies that run counter to the precepts of free markets, it must be noted that there is not a free market in the international uranium trade right now. Russia, Uzbekistan, and a few others are flooding the market and using patently un-free trade tactics to gain more control of the market than would be possible in a free environment. These nations uranium industries are arms of the state, and, as such, are used as instruments of foreign policy. That is not a free market, and American companies simply tying to do business fairly and properly are being chewed up in the process.

Furthermore, the measures being proposed will not cause harm or great expense to American users of uranium, namely the nuclear power plants. An import quota will increase the price of uranium dramatically, since it will bring back some semblance of a free market; and, allow domestic production to increase in response to domestic demand. The United States has more than enough uranium to meet demand, especially when you combine the number of mines and processing facilities that are both operational and planned.

American power plants and consumers have nothing to fear from a freer market in uranium; but we as a nation have plenty to fear if Russian economic aggression kills our uranium industry and makes us dependent on theirs.

Thank You.

Cordially, Louise Meier

Louise Meier
Box 281
Naturita, Co 81422

August 21, 2018

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Mr. Vaccaro,

The purpose of my letter is to encourage you to adopt a 25% quota for American uranium producers for use in nuclear energy production. Our President has championed putting America first, and ensuring not only the vitality of this crucial industry, but also the security of our power grid is of paramount importance.

The United States uranium industry has more than enough production capability to meet the requirements, including a number of permitted and constructed mining and processing facilities currently operating or on standby. And claims that instituting this quota will cause severe economic distress are erroneous. I grant that certain nuclear power plants are under financial duress, but that's attributed to cheap natural gas and misguided (although well-intentioned) renewable energy subsidies. By instituting a quota, I think you'll see increased competition and efficiency, which will be good for rate-payers over the long run, and you'll be supporting American industries instead of sending money and jobs overseas to regimes that aren't always stable, nor are they friendly to U.S. interests.

I believe this quota will be beneficial for all parties concerned for the reasons outlined above, and I hope you'll listen to the voices of real Americans and their calls to put America first, not only here, but in everything we do. I very much appreciate the opportunity to comment, and am confident you will make the right decision.

Respectfully submitted,

John Strohm
12 Lynn Road
Englewood, Co.
80113

August 21, 2018

Acting Director, Office of Technology Evaluation
Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Attention: Michael Vaccaro

Dear Mr. Vaccaro,

There is a proposal before you regarding instituting a quota of 25% for domestically produced uranium. This is a good idea. America should take care of America first. So, by enacting this policy, you ensure that we are not too heavily reliant on foreign sources of fuel from nations that compete with us on all fronts. You also embolden American jobs and prioritize American sources of energy. All these goals are laudable. So, why the need to write in?

I've heard the U.S. government is likely to run out of uranium for certain non-defense priority programs as early as 2025, and low-enriched uranium (LEU) for tritium production as soon as 2027.

I've also heard the National Defense Authorization Act calls for the construction of additional naval vessels and the Navy is planning to extend the life of other nuclear-powered vessels previously slated for decommissioning, all which will consume more uranium.

Therefore, we need to ensure that we have healthy uranium and nuclear fuel industries that are able to respond to these critical missions. For without them, we are at the whim of other countries who don't always like the U.S., and what it stands for, or what it does. And if something as simple as putting a quota in place helps to prevent possible future trouble, why not do it? I trust the right decision will be made.

Humbly,

Mason Stefancic
6046 S. Ukraine St.
Aurora, CO 80016

September 26, 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Re: Comments on Section 232 National Security Investigation of Imports of Uranium

Dear Mr. Vaccaro,

I would like to thank the Department of Commerce for the opportunity to respond to the "Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Uranium" published in the Federal Register on July 18, 2018.

We are royalty owners on land in Wyoming and currently under a uranium mining lease, and are highly concerned over what has been happening over the past years concerning the curtailment at uranium plants and future mine sites.

The US uranium industry has suffered immensely, and our national security is threatened due to excessive imports of foreign uranium. The United States over reliance of price insensitive uranium from countries like Russia, Kazakhstan and Uzbekistan with their state-owned and funded companies has displaced US production and led to a severe decline in the industry.

I encourage the Department of Commerce and President Trump to take actions that are supportive of the uranium industry and protect our national security and energy interests that are dependent on this vital industry.

Sincerely,

John W. McCullough
P.O. Box 45
605 W. Crowder Road
Trenton, MO 64683

17 August 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Rm 1093
Washington, D.C. 20230

Dear Mr. Vaccaro,

This letter is intended to express to your office my full support of the investigation into the impacts of uranium imports on national security. I believe it is very simple: uranium is a vital national resource, and the government must take any necessary steps to ensure the security and availability of a domestic source of it.

Russia and China are America's largest and most dangerous international competitors and are constantly vying for geopolitical advantage over us. They also happen to be two of the largest producers of uranium. As part of their arsenal, both countries have a history of using state-owned businesses and industries as economic weapons, and they are doing so here. In complete and utter disregard of the market, both countries have subsidized their state-run uranium industries to a tremendous degree, in an effort to devalue uranium to the point where American producers, attempting to operate in a free market, cannot begin to compete.

The problem, of course, is that when Russia and China control the market, we will be dependent on our geopolitical rivals for a geopolitically critical resource. It is not only conceivable, but absolutely likely, that both countries will use uranium exports as a trade weapon in response to sanctions (in the case of Russia) or trade tariffs (in the case of China). We cannot let access to the uranium we need for running our submarines and aircraft carriers, and for producing electricity for millions of our citizens, to be used as a pawn in that way.

In response to what is very clearly a threat to our national security, America's two primary uranium producers, Energy Fuels and Ur-Energy, both in Denver, Colorado, filed a petition under Section 232 of the Trade Expansion Act of 1962, requesting the Department of Commerce to conduct an investigation into the national security implications of uranium imports into our country, and urging the President to act accordingly on their findings, specifically by implementing domestic production quotas and whatever other steps are needed to secure our domestic supply of uranium.

This is not protectionism for its own sake, or some attempt to sidestep the free market; this is a national security measure that ensures that our nation has access to the uranium we need for our current and future defense and energy requirements and are not beholden to adversarial foreign regimes. Unlike tariffs, the remedies proposed by the petitioners will not hurt U.S. consumers; in contrast, doing nothing, and allowing Russia and China to run roughshod over our uranium industry will hurt American citizens in the pocketbook, and potentially in far more serious ways as well.

Sincerely,
Debbie Moore
Debbie Moore, Vista Reality

PO 442

Nuturita, CO 81422

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August 25th, 2018

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Mr. Vaccaro,

We appreciate the work your office and the Department of Commerce does to ensure free and fair trade, and a level playing field for American businesses. We are especially thankful that you have initiated an investigation into the effects of our nation's security of imports of uranium, pursuant to a Section 232 petition. We take this as a sign that you recognize the threat posed to a critical strategic American industry by the unacceptable trade practices of certain foreign nations.

Over the past several years, Russia, Uzbekistan, Kazakhstan, and lately China have used their state-owned and operated uranium corporations as instruments of national policy, subsidizing them to whatever enormous extent necessary to undercut American private uranium businesses and take ever expanding control of the market. If these nations continue these tactics, and there is no indication that they will not, in a few years they will have succeeded in dismantling the American uranium industry. In response to this threat, Energy Fuels and Ur-Energy joined together to submit the 232 petition and have proposed reasonable remedies that will support the continuation of an American uranium industry, despite the economic assault levelled by Russia et al, while avoiding the negative consequences to American consumers that often accompany less elegant and more strictly protectionist retaliatory trade actions.

The proposed remedies include an import quota that will ensure American uranium producers have access to a quarter of the commercial American uranium market, and a policy that federal agencies that buy uranium do so from American sources. Unlike tariffs, these proposals will have a minimal effect on American utilities that purchase uranium. The fuel costs for these utilities has been steadily dropping over the past several years, making fuel input costs less and less of a factor. As such, it is estimated that both remedies will have only a 0.8% – 1.2% impact on the costs to utilities. So, the benefits to our nation will far outstrip any potential cost.

The American uranium industry – producers of a key strategic resource – has been attacked economically by foreign states which happen to compete with the United States for global power and influence. This has an immediate and clear impact on our nation's security. But I believe that the remedies offered by the petitioners can provide a way out of the situation; I therefore ask that the investigation be completed in a timely manner, and that the Administration, led by the Commerce Department, immediately begin implementing these necessary proposals.

Sincerely,

Ken Neesham

Ken Neesham

PO 102

Nucla CO 81421

8/22/18

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, D.C. 20230

Dear Mr. Vaccaro,

The national security investigation concerning uranium imports is possibly one of the most important undertakings the U.S. Department of Commerce could be engaged in. I support the investigation and feel that it is essential it be done quickly but comprehensively, and that remedies in line with those suggested by the petitioning organizations be adopted in due course to protect both U.S. uranium production and our national security.

Energy Fuels and Ur-Energy, both Denver-based, are the two main producers of uranium in the United States. Together, they supplied more than half of the uranium produced and used in the U.S. in 2017. These companies, though competitors, recognize the importance of maintaining a secure domestic supply of uranium, both for energy generation and for our most critical national defense needs. That is why they joined together to file a Section 232 petition requesting the investigation of the harm being done to this country by importing most of our uranium. The problem is that certain uranium-producing nations – notably Russia and China – also happen to be geopolitical rivals of the U.S. and are committed nationally to undermining, even destroying, the American uranium industry to provide themselves a critical strategic advantage. It is frightening to see that they are succeeding.

Simply conducting an investigation, of course, is not enough. I am certain that the investigation will reveal the problems of allowing foreign competitors to use their state-run industries as weapons and will in-turn offer recommendations to correct this situation. Energy Fuels and Ur-Energy included in their petition a request that remedies be developed and applied, and even developed a set of suggested remedies that would reverse the potentially destructive course our nation is heading on. Commerce Secretary Ross and President Trump need to be brought up-to-speed on this situation quickly, and, just as quickly, need to take decisive action to maintain the long-term viability of our domestic uranium industry.

Thank you,

Dale Osborn

PO 356

Nucla, CO 8424

August 28, 2018

Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
Attn: Michael Vaccaro, Acting Director
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

RE: National Security Investigation of Uranium Imports

Dear Mr. Vaccaro and Commerce Department Staff,

For Reams Construction, we thank you for the opportunity to comment on the Section 232 investigation into the national security implications of the import of uranium, and the suggested remedies that were offered in conjunction with the 232 Petition requesting the investigation. We support this investigation, and I ask that the administration adopt the remedies as presented.

Anti-free-market tactics being employed by Russia, China, and their allies in the global uranium mining and nuclear fuels industry are threatening the American uranium industry and consequently our energy security and even our national security. These tactics, which include heavily subsidizing state-run uranium mines and nuclear fuel corporations with the specific intent of undermining the financial viability of privately-owned uranium companies in the U.S. and the rest of the West, are placing tremendous pressure on our industry, to the point where its very existence is threatened. Already, uranium imports from these countries are overtaking the American industry's share of the domestic nuclear fuel market and are crowding our American producers more every year. This not only makes us dependent on these countries for our nuclear power generation capability, but the disappearance of a domestic industry will greatly curtail our ability to source uranium for defense needs.

Currently, all the uranium produced by the top uranium companies in the nation goes for fueling nuclear power plants. However, because international treaties of which the United States is a signatory demand that uranium for defense purposes must be domestically sourced, we need to ensure that a domestic industry survives so that we are able to meet future defense needs, such as upgrading and boosting our nuclear arsenals, and providing fuel for naval reactors. This capability is threatened by the aggressive economic actions pursued by Russia and China against our uranium industry.

That this is occurring is not a surprise. Russia and China both compete with the U.S. globally for geopolitical influence and commercial advantage and are willing to do whatever it takes to gain and maintain that advantage. They both also have a long history of nationalizing their energy industries and using these state-run industries as instruments of foreign policy.

With all this in mind, I support instituting a cap on uranium imports, so that at least a portion of the domestic market is available for our own producers, thus, preserving the industry and ensuring our continued energy independence and ability to maintain a strong national defense.

Thank you,

John Reams

John Reams

President, Reams Construction

PO Box 106

Naturita, CO 81422

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August 25, 2018

Director Michael Vaccaro
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room #1093
Washington D.C. 20230

Dear Director Vaccaro

I'm submitting this letter to your department to encourage you to commit to the investigation about American uranium production and trade. The United States has always been a leader in energy and defense, but the current climate of uranium production has jeopardized that. Currently, nations like Russia, China, and Uzbekistan are destroying the national uranium trade by degrading free market policy. Doing so, these nations have put the US at risk in several serious ways. This investigation can fix these issues and stimulate our economy.

Only 5% of American uranium consumption comes from American suppliers. Sadly, this is only because the US requires that all uranium used for national defense is to be produced by American companies. If it were not for that policy the remaining uranium industry would dry up and the workers would be added to the unemployment pool. Poor domestic sales of American uranium is due to the US buying subsidized uranium from China and Russia for far less. There uranium is priced so low because it has been partially paid for by their respective governments. This means energy producers can buy their uranium from these nations for less than what they can buy unsubsidized uranium for from an American producer. This has led to record lows in American uranium production and massive layoffs industry wide. The largest American uranium companies are running at capacities as low as 9%. The reduction of American uranium is not a reflection of US capability or US free trade policy. Rather, the reduction is caused by unfair and anti-free market policies of nations like China and Russia.

The more sinister side of this is the fact that the US is susceptible to the decisions of the nations that have us hooked on their uranium. Our energy grid relies on uranium especially when it comes to filling in the gaps that other, less constant, energy sources cause. Without uranium the US would be more reliant on less stable energy sources and would be more prone to blackouts. The investigations would not only ensure that the US could power itself, but it would also decrease foreign nations ability to attack our power grid or our economy. I can't stress enough how important this investigation would be to bring back jobs in the uranium industry and increasing national security via energy independence.

Thank you,

Rick Schumann

PO Box 219
Nucla, CO 81424

August 17th, 2018

Mr. Michael Vaccaro - Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

Dear Mr. Vaccaro;

Please accept this letter as my support of Energy Fuels and Ur-Energy in their efforts related to their Petition for Relief Under Section 232 of the Trade Expansion Act of 1962, requesting that the Department of Commerce launch an investigation into the national security consequences of importing uranium into the United States. This is a very serious matter, and I am pleased to see that the Department has initiated such an investigation, and I hope that the Administration will enact the remedies suggested by the petitioners.

The situation is rather stark and sobering. U.S. domestic uranium production has been falling steadily for several years, to the point where it is expected to be at an all-time low this year. Meanwhile, imports from other countries, particularly Russia, Kazakhstan and Uzbekistan have been increasing. Now, more than one-third of U.S. uranium demand is met by those three countries, while domestic supplies are used to meet only four percent, a figure which is falling. To make matters even more worrisome, Chinese entities are also making moves on the U.S. market.

The problem is that these countries are manipulating the market. All have uranium industries that are fully state-owned and operated, and each is heavily subsidizing the state-run industries. These countries, China especially, are increasing their uranium mining capabilities at a feverish pace, despite a glut in the market which is forcing the decline in the American industry which is trying to play by the rules and operate in a free market.

This is a terrible place for America to be in. Uranium is necessary for the generation of nuclear power, which is responsible for 20 percent of our nation's electrical grid, and this attack on our uranium industry has left us dependent on the same international competitors who initiated those economic assaults in the first place. Furthermore, since international treaties insist that defense-related uranium be domestically sourced, it is imperative from a national security standpoint that our domestic industry be preserved. This investigation will, without doubt, shed some needed light on this shaky state of affairs, and will hopefully recommend remedies in line with those suggested by the petitioners.

Sincerely,

Katie Squires

Po Box 488
Naturita, CO
81422

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Tabeguache Trading Co.
Nucla, CO
Est. 2017

Michael Vaccaro
Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Rm 1093
Washington, DC 20230

Re: Industry and Security Bureau pertaining to Uranium imports

Dear Mr. Vaccaro,

I support the investigation into the devastating effects importing uranium from other countries and the negative impact it has on our national security. Putting America first and not relying on any imports is in the best interests of the economic and securities of the country.

A revival of the Uranium Industry to our area would have a huge positive impact on our area and would increase economic and employment opportunities. This industry is a part of our historical heritage and the people here and all over work hard to never forget the wonderful memories that uranium mining and milling brought together. To revive this industry here would mean that families could move back home and have jobs waiting for them.

Sincerely,

Aimee Tooker

Aimee Tooker, President

Tabeguache Trading Co

470 Main Street

Nucla, CO 81424

P

Michael Vaccaro
Acting Director, Office of Technology Evaluation
Bureau of Industry and Security, U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

August 24, 2018

To the Office of Technology Evaluation:

I have concerns about both carbon emissions and rising electricity costs, which are both reasons to support nuclear energy. However, another problem is that so much of our uranium comes from overseas sources. And cost plays a key role in the decision you have before you about the proposed 25% production quota for domestic uranium. But let me address both issues here briefly.

While it's true that some nuclear power plants in the U.S. are under financial distress, the reason for that is market distortions caused mainly by cheap natural gas and renewable subsidies, not fuel costs.

The claims that the production quota will cause severe economic distress to nuclear power plants, or even shut-down plants, are enormously exaggerated and demonstrate a lack of knowledge of U.S. production capabilities and costs.

The U.S. uranium industry has more than enough production capability to meet the requirements, including a number of permitted and constructed mining and processing facilities currently operating or on standby.

Of greater concern is the cost that would be associated with dependence on Russia for our nuclear fuel. If we rely on them, we open ourselves up to financial extortion, supply restrictions, and the like. That would translate to either higher energy costs for working Americans, or a return to coal for electrical generation.

This quota will not harm the industry or its ratepayers. Plus, it does good things for our economy, our environment, our national security, and for our overall peace of mind. Please approve the quota.

Warmly,

Brianna Thornburg
359 Knobcone Dr. #105
Loveland, CO 80538

Director Michael Vaccaro,
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

August 24, 2018

Dear Director Vaccaro,

I am writing this letter to encourage you and your department to follow through with your investigation about the US uranium industry. As you know the global uranium industry has been attacked by nations like China, Russia and Russian loyalists like Kazakhstan and Uzbekistan. These nations have over produced their uranium consumption and have turned to selling the surplus to other nations, including the United States. This normally wouldn't be a problem but these nations either own their uranium producers or heavily subsidize them. This means the uranium they are selling can be priced at an artificially low rate. Since the US continues its policy of free trade, American uranium is not being subsidized and therefore must be sold at a full, honest, price.

Competing with artificially low prices has led to American producers being cut out of the uranium trade, even for our own national use. US law requires that uranium used for defensive weapons must be produced in the US. If it weren't for that measly 5% of uranium consumption being used for national defense, the American uranium industry could be wiped out completely. American uranium production is at a low that hasn't been seen in the last 70 decades. Layoffs are happening in the industry left & right and the largest American uranium companies are operating on average at 11% capacity. With so much on the line, this investigation is vital to increasing production, and providing American jobs.

Not only are the jobs of hardworking blue-collar Americans at risk but also our national security. The same nations that are putting our uranium workers out of jobs are ones that have been the least friendly to the US in recent history. China and Russia have the option of cutting us off from their uranium supplies and with our industry in a record setting slump this would spell disaster for our energy grid. Uranium supply's steady and constant energy that prevents brown and blackouts. This investigation could lead to energy independence that would deny our competitors the option of inflicting instability on our energy grid. A policy that favors American consumption of American uranium would not only solve these current weaknesses, but it would do so in a way that wouldn't degrade free trade.

Thank you for taking the time to read and understand my concerns.

Vicki Bowersox
540 W 5th
Nucla, CO 81424

P August 17, 2018

Mr. Michael Vaccaro, Acting Director
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

RE: Section 232 National Security Investigation of Imports of Uranium

Dear Mr. Vaccaro;

The U.S. Department of Commerce's investigation into the national security consequences of uranium imports, as requested by Energy Fuels and Ur-Energy, as well as the proposed remedies which were also offered by those two businesses, are vital to both America's economy and national security.

Among the recommendations is a 25% uranium quota which sets aside a quarter of the uranium used in the country to be exclusively the domain of American uranium producers. This is not a tariff, nor a crude protectionist measure; the American uranium mining industry can, and should, compete openly in a global free market. Unfortunately, the global market in neither open nor free, with heavily subsidized state-owned uranium companies, predominantly from Russia and Kazakhstan, effectively controlling the world's uranium supply, in a manner reminiscent of OPEC. These remedies are needed, not to provide any sort of unfair advantage to American uranium companies, but simply to level the playing field and ensure that our country is not held hostage to tightly controlled supplies of a vital national resource.

And while Russia and a couple of its neighbors are currently the most active and aggressive players in the battle for market share of uranium, China is also actively expanding, and promises to be at least an equal threat. There are few commodities for which having some level of domestic control is so critically important as uranium. Uranium, of course, is not only a tremendous source for clean, abundant, zero-carbon energy, but also the central component of our nuclear umbrella, not to mention the power source for our most powerful and capable warships. Make no mistake, Russia and other countries who potentially harbor ill will towards the United States have engaged in a deliberate attempt to neutralize the American uranium industry; the numbers indicate that they are succeeding. According to the Energy Information Agency, in the first quarter of 2018, U.S. uranium production hit its lowest level in 70 years and was 50% lower than at the same point in 2017. Clearly, this is a serious issue, and the Department of Commerce is to be commended for investigating it.

Respectfully,
Darcy Weir
1380 N. 24th Street
Grand Junction, Colorado 81501

August 22, 2018

Michael Vaccaro, Acting Director
Office of Technology Evaluation
Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW
Room 1093
Washington, DC 20230

Dear Mr. Vaccaro,

The National Security Investigation into Imports of Uranium, being undertaken by the Department of Commerce under Section 232 of the Trade Expansion Act, is important for the economic and physical well-being of our nation. As such, I would ask that the investigation be expedited as soon as possible, to limit the damage being done, as we speak, and so that remedies can be applied as quickly as possible. The issue is the damage being done to America's domestic uranium industry by unfair and deliberately harmful and distortive policies by certain leading international uranium producers, specifically Russia, Uzbekistan, and Kazakhstan, with China now indicating that it will follow suit. These policies, which include heavily subsidizing national state-owned uranium companies in a deliberate bid to undercut American uranium producers, are having the effect, desired by these countries, of economically dismantling the U.S. uranium industry (which has happened in Western Colorado, devastating the economy). But as America's native uranium industry contracts, so does our national and energy security.

The proof is in the numbers; last year, American domestic uranium production fell to nearly unprecedented levels. This was due in very large part to uranium and nuclear fuel being imported from foreign nations – predominantly those mentioned above – whose state-owned entities are heavily subsidized. These countries are not operating within a free market template; to them, uranium production and export is a national objective, and is being treated as the execution of state policy. Recognized in that light, it is easy to see that subsidization on any level, if required to fully control the market, is worth the cost to them, just as the cost of buying enough tanks, planes, and warships is worth it to win a war.

If uranium were no more important to our nation than any other commodity, this would not be as much of an issue. But the fact is that a healthy domestic uranium industry is critically important to American national security; the uranium industry provides the fuel for nuclear power, which is a key component of U.S. energy infrastructure and electrical grid stability. Also, it goes without saying that uranium is critical to the production and improvement of our most vital defense assets. We cannot use imported uranium for our defense needs – if the U.S. industry collapses due to external trade pressures, where will we source our military-grade uranium? Western Colorado has the uranium resources necessary to help protect our country.

There can be no question of the importance this industry to our future, our economy, and our safety. This investigation is long overdue, and recommendations it generates must be applied immediately.

Regards,

Deana Stupp

P.O. Box 645
217 W. Main Street
Naturita, CO 81422

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www.choosewestend.org

WillSource Enterprise

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Denver, Colorado 80202
Phone: 303-575-9696
Fax: 303-575-9697
A Limited Liability Company

August 30, 2018

Office of Technology Evaluation, Bureau of Industry and Security
Michael Vaccaro, Acting Director
U.S. Department of Commerce
1401 Constitution Avenue NW. Room 1093
Washington, DC 20230

Dear Mr. Vaccaro and OTE staff:

In regards to the Section 232 National Security Investigation of Imports of Uranium, initiated by your office earlier this summer, I ask that it be done thoroughly and that it make a complete accounting of the practices of our geopolitical competitors in this arena; but also that it be completed quickly, in order for the recommended remedies to be applied before any further harm is done to our country.

American uranium producers can compete on a level playing field – we have the resource, the technology, the expertise, the innovative drive, and all other requirements for competing fairly among each other and with other nations on the world stage. However, as it stands today, the playing field is far from level. A free market simply does not exist within the global uranium trade, as some of the largest producers – Russia, Kazakhstan, Uzbekistan, and lately China – are employing monopolistic trade practices that are disrupting the global market, undercutting U.S. and western uranium companies, and injecting Russia's state-owned companies into taking an outsized share of the domestic market. It is to the point where about 1/3 of America's fuel for powering nuclear reactors is coming from Russia, China, or their allies, while American producers supply less than 4%, a figure that shrinks every year.

At this rate, it will only be a year or two until the American uranium industry is rendered financially unviable, and dissolves altogether, leaving only Russia et al to fill the hole. At that point we will be entirely dependent on these foreign states for what well may become our most important fuel source in the coming years. It is discomforting to say the least to think that our energy supply would be in the hands of a region notorious for political instability and international duplicity.

This need not be a forgone conclusion; an elegant and practical free-market-oriented remedy is prosed, a call for a quota to be imposed on uranium imports, which would effectively reserve 25 percent of the American uranium market for American uranium producers, as well as a requirement that U.S. government agencies which purchase uranium do so from Americans. This solution avoids the economic unpleasantness of tariffs and avoids direct interventions by the government into the market, such as seen in price controls and similar schemes. An import quota would harm only those nations which choose to engage in economic warfare against us, but will not raise domestic uranium prices appreciably, given the vastness of the reserves present in the U.S. and the efficiencies of American industry. For the sake of our countries future energy independence, I ask that the Administration move quickly on this important matter.

Signed,

WillSource Enterprise, LLC

Reed F. Williams

President

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August 21, 2018

Bureau of Industry and Security, U.S. Department of Commerce
Attention: Michael Vaccaro, Acting Director, Office of Technology Evaluation
1401 Constitution Avenue NW, Room 1093
Washington, DC 20230

To Whom It May Concern:

Like our President, I believe in putting America first. That's true in manufacturing, defense, global politics, and energy production. The United States has abundant natural resources ranging from coal to oil and gas to renewables. When I think about this, it's confusing to me that our uranium industry is lagging behind. Why?

The U.S. uranium mining industry can compete globally on a level-playing field. But, a level playing field does not exist, as state-owned and state-subsidized entities are attempting to take control over today's nuclear industry. Chinese entities own and subsidize large uranium mines that are expanding production, despite having costs that are far above the price of uranium, and they're dramatically increasing their uranium enrichment capabilities, despite a glut in this market. It's actions like these and aggression from Russia that are imperiling the US uranium industry—this is bad for Americans.

We should embolden our own uranium production by requiring that a minimum of 25% of U.S. uranium come from domestic producers. This would blunt the impact of the actions taken by China, Russia and others and put American jobs, American industry, and American interests first. Please get in line with what our President espouses and help to make the United States uranium industry great again!

Thank you,

Mary P. Funk
12 Lyon Rd
Englewood, Co
80113

P

Mr. Michael Vaccaro
Office of Technology Evaluation, Bureau of Industry and Security
U.S. Department of Commerce
1401 Constitution Avenue NW, Room 1093
Washington D.C. 20230

This letter is to encourage the investigation about our reliance on foreign uranium. Our reliance is a threat to national security and continues to hurt our economy. We can't let nations like Russia, China, and Uzbekistan dictate our energy policy and threaten our national energy grid. These nations have displayed less than friendly economic policies toward the US. Buy too much uranium from them practically hands our national security over to them. Additionally, their governments fund their uranium trade which unfairly undercuts American uranium. It's a dirty tactic that we have allowed to go on for too long. Our uranium industry must be kept strong for our protection and safety from physical threats. If our industry is too weak to produce uranium we will eventually be forced to rely on foreign nations for our defense uranium. This means our nations missile and naval defense systems could be damaged by Russia and China if they decide to stop trading their uranium.

Just as important as national security is well paying domestic jobs. We need to bring mining back to western Colorado. We were the hub for uranium production during the early and mid-19th century. It brought tax revenue, good jobs, and infrastructure to several counties on the Western Slope including Montrose, Delta, and Mesa Counties. The average mining salaries vary between $56,000 and $60,000 a year. That's 70% more than the average salary of an individual with a high school diploma. These salaries even compete with the average salary of individuals who have a four-year bachelor's degree. This investigation can bring back jobs to western Colorado that allow a single income to support an entire family. These are the job the region is in desperate need of.

I encourage you, Mr. Vaccaro, to conduct this investigation into the threats to our national security and economic wellbeing.

Signed,

PO Box 476
Naturita, Co 81422

Appendix D

Next Page

OMB Control Number: 0694-0120
Expiration Date: November 30, 2019

Section 232 Investigation: The Effect of Imports of Uranium on the National Security

Front End Survey

SCOPE OF ASSESSMENT

The U.S. Department of Commerce, Bureau of Industry and Security (BIS), Office of Technology Evaluation (OTE), is conducting a survey of the U.S. uranium mining, milling, conversion, enrichment, and fuel fabrication sectors. The survey results will be used to support an ongoing investigation of the effect of imports of uranium on the national security initiated under Section 232 of the Trade Expansion Act of 1962, as amended.

The principal goal of this survey is to assist the U.S. Department of Commerce in determining whether uranium is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security. Information collected will include facilities and production data, mergers and acquisitions, joint ventures, imports and exports, supply chain networks, customers, sales and demand data, employment information, conditions of domestic and global competition, research and development, and other financial factors. The resulting data will provide the U.S. Department of Commerce detailed uranium industry information that is otherwise not publicly available and needed to effectively conduct this Section 232 investigation.

RESPONSE TO THIS SURVEY IS REQUIRED BY LAW

A response to this survey is required by law (50 U.S.C. Sec. 4555). Failure to respond can result in a maximum fine of $10,000, imprisonment of up to one year, or both. Information furnished herewith is deemed confidential and will not be published or disclosed except in accordance with Section 705 of the Defense Production Act of 1950, as amended (50 U.S.C. Sec. 4555). Section 705 prohibits the publication or disclosure of this information unless the President determines that its withholding is contrary to the national defense. Information will not be shared with any non-government entity, other than in aggregate form. The information will be protected pursuant to the appropriate exemptions from disclosure under the Freedom of Information Act (FOIA), should it be the subject of a FOIA request.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

BURDEN ESTIMATE AND REQUEST FOR COMMENT

Public reporting burden for this collection of information is estimated to average 14 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information to BIS Information Collection Officer, Room 6883, Bureau of Industry and Security, U.S. Department of Commerce, Washington, D.C. 20230, and to the Office of Management and Budget, Paperwork Reduction Project (OMB Control No. 0694-0120), Washington, D.C. 20503.

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

Table of Contents

I	Cover Page
II	Table of Contents
III	General Instructions
IV	Definitions
1	Organization Information
2	Mergers & Acquisitions Activity
3	Facility and Undeveloped Uranium Resource Information
4	Production and Inventory
5	Financial Information
6	Capital Expenditures
7	Research & Development
8	Imports
9	Customers and Contracts
10	Employment
11	Competition and Demand Trends
12	Certification

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

General Instructions	
A.	Your organization is required to complete this survey of the U.S. uranium mining, milling, conversion, enrichment, and fuel fabrication sectors using an Excel template, which can be downloaded from the BIS website: http://www.bis.doc.gov/uraniumFE If you are unable to download the survey document, at your request, BIS survey support staff will e-mail the Excel survey template directly to you. For your convenience, a PDF version of the survey and required drop-down content is available on the BIS website to aid internal data collection. **DO NOT SUBMIT** the PDF version of the survey as your response to BIS. Should this occur, your organization will be required to resubmit the survey in the requested Excel format.
B.	Respond to every question. Surveys that are not fully completed will be returned for completion. Use the comment boxes to provide any information to supplement responses provided in the survey form. Make sure to record a complete answer in the space provided, even if the space does not appear to expand to fit all of the information. **This is a comprehensive survey of the entire front end nuclear fuel industry. As such, some questions may not be relevant to your organization. Read each question carefully to determine applicability to your organization.** **DO NOT CUT AND PASTE RESPONSES WITHIN THIS SURVEY OR PASTE IN RESPONSES FROM OUTSIDE THE SURVEY**. Survey inputs should be completed by typing in responses or by using a drop-down menu. The use of cut and paste can corrupt the survey template. If your survey response is corrupted as a result of cut and paste response, your survey will be rejected and your organization must immediately resubmit the survey.
D.	**Do not disclose any USG classified information in this survey form.**
E.	Upon completion of the survey, final review, and certification, **transmit the survey document via e-mail to**: Uranium232@bis.doc.gov
F.	Questions related to the survey should be directed to BIS survey support staff at Uranium232@bis.doc.gov. E-mail is the preferred method of contact. You may speak with a member of the BIS survey support staff by calling (202) 482-3800.
G.	For questions related to the overall scope of this Section 232 Investigation, contact Uranium232@bis.doc.gov or: Brad Botwin, Director, Industrial Studies Office of Technology Evaluation, Bureau of Industry and Security, Room 1093 U.S. Department of Commerce 1401 Constitution Avenue, NW Washington, DC 20230 **DO NOT** submit completed surveys to Mr. Botwin's postal or personal e-mail address. All surveys must be submitted electronically to: Uranium232@bis.doc.gov

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Definitions	
Term	**Definition**
Alternate Feeds	A classification created by the Nuclear Regulatory Commissions that includes material that is not traditional ore, that can be processed to recover uranium for its source material content.
Applied Research	A systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met. This activity includes work leading to the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes.
Authorizing Official	An executive officer of the organization or business unit or another individual who has the authority to execute this survey on behalf of the organization.
Basic Research	A systematic, scientific study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts.
Boiling Water Reactor (BWR)	A common nuclear power reactor design in which water flows upward through the core, where it is heated by fission and allowed to boil in the reactor vessel. The resulting steam drives turbines, which activate generators to produce electrical power.
Capital Expenditures	Investments made by an organization in buildings, equipment, property, and systems where the expense is depreciated. This does not include expenditures for consumable materials, other operating expenses, and salaries associated with normal business operations.
Customer	Any organization (external or internal entity) for which your organization manufactures/processes any product comprised of, or containing, uranium in any form.
Conventional Mining	The act of removing uranium ore from deep underground shafts or shallow open pits.
Defense-related Activities	Any product or service that your organization produces that is ultimately used by the U.S. government for defense purposes, whether by the armed services, the Department of Defense, or any other U.S. government entity.
Depleted Uranium	Uranium in which the percentage fraction by weight of U-235 is less than 0.711 percent.
Development	The design, simulation, and testing of a prototype, including experimental software or hardware systems, to validate technological feasibility or concept of operation in order to reduce technological risk, or provide test systems prior to production approval.
Enriched Uranium	Includes enriched uranium oxide, enriched uranium hexafluoride, and other enriched uranium. Uranium enriched in U-235 and its compounds: alloys, dispersions (including cermets), ceramic products, and mixtures containing uranium enriched in U-235.
Exports	Shipments to destinations outside the United States.
Facility	A building or the minimum complex of buildings or parts of buildings that conduct mining, milling, conversion, enrichment, fuel fabrication, and/or nuclear power generation-related operations, in which an organization operates to serve a particular function, producing revenue, and incurring costs for the company. A facility may produce an item of tangible or intangible property or may perform a service. It may encompass a floor or group of floors within a building, a single building, or a group of buildings or structures. Often, a facility is a group of related locations at which organization employees work, together constituting a profit-and-loss center for the company, and it may be identified by a unique DUNS number.
Foreign Corrupt Practices Act of 1977 (FCPA) 15 U.S.C. §§ 78dd-1	The Foreign Corrupt Practices Act (FCPA), enacted in 1977, generally prohibits the payment of bribes to foreign officials to assist in obtaining or retaining business. The FCPA can apply to prohibited conduct anywhere in the world and extends to publicly traded companies and their officers, directors, employees, stockholders, and agents. Agents can include third party agents, consultants, distributors, joint-venture partners, and others.

Fuel Assemblies	A structured group of fuel rods (long, slender, metal tubes containing pellets of fissionable material, which provide fuel for nuclear reactors).
Fuel Elements	Includes fuel rods or fuel pellets, non-irradiated, and other parts thereof.
Fuel Fabrication	The last step in the process of turning uranium into nuclear fuel rods, whereby enriched UF6 is converted to uranium dioxide powder that is pressed into pellets and inserted into fuel rods, grouped together to form fuel assemblies.
Full Time Equivalent (FTE) Employees	Employees who work for 40 hours in a normal work week. Convert part-time employees into "full time equivalents" by taking their work hours as a fraction of 40 hours.
Global Headquarters	A location that serves as the organization's hub of worldwide operations with all global branches or divisions reporting to it.
Harmonized Tariff Schedule (HTS)	A 10-digit numbering system that classifies a good based on its name, use, and/or the material used in its construction. The number provides Customs and Border Protection (CBP) with a standardized method of tracking all merchandise imported into the United States and sets out the tariff rates and statistical categories.
Import Value	Values reported should be landed, duty-paid values at the U.S. port of entry, including ocean freight and insurance costs, brokerage charges, and import duties (i.e., all charges except inland freight in the United States).
Inventory	The goods or materials an organization holds for its own use or for the ultimate goal of sale, or disposition or future conversion, enrichment, fabrication, or other use. This is material to which your organization has title; this does not include holding material for third-party use or storage.
In Situ Recovery (ISR)	Formerly known as in situ leach recovery, ISR is the process where uranium ore is chemically altered underground before being pumped to the surface for further processing.
Term Contract	Contracts with one or more uranium deliveries to occur after a year following the contract execution (signed date), and as such, may reflect some agreements of short and medium terms, as well as longer term.
Natural Uranium	Uranium with the same isotopic ratio as found in nature. This includes uranium ore and concentrates (U3O8) and natural uranium hexafluoride (UF6).
Non-U.S. Facility	A facility that is physically located outside of the United States.
Organization	A company, firm, laboratory, or other entity that owns or controls one or more U.S. establishment or facility capable of designing and/or manufacturing products in the mining, milling, conversion, enrichment, or fuel fabrication activities of the nuclear fuel cycle.
Pressurized Water Reactor (PWR)	A common nuclear power reactor design in which very pure water is heated to a very high temperature by fission, kept under high pressure (to prevent it from boiling), and converted to steam by a steam generator. The resulting steam is used to drive turbines, which activate generators to produce electrical power.
Product/Process Development	Conceptualization and development of a uranium or nuclear fuel-related product or system prior to the production of the product for customers (i.e., utilities, governmental agencies etc.).
Production	The process of transforming inputs (raw materials, semi-finished goods, subassemblies, ideas, information, knowledge) into goods or services.

Research & Development	Basic and applied research in the engineering sciences, as well as design and development of prototype products and processes. Efforts that an organization conducts towards innovating, introducing and/or improving products and processes.
Russian Suspension Agreement	On October 16, 1992, the Department of Commerce suspended the antidumping duty investigations involving uranium imports from Russia on the basis of agreements by the country's government to restrict the volume of direct or indirect exports to the United States in order to prevent the suppression or undercutting of price levels of United States domestic uranium. The agreement expires in 2020.
Sales	All reported and unreported sales of uranium (natural, converted, enriched and/or fabricated), including sales to end-users, producers, conversion facilities, enrichers, financial entities, intermediaries, traders, distributors, et al.
Separative Work Unit (SWU)	The standard measure of enrichment services.
Spot Contract	Contracts with a one-time uranium delivery (usually) for the entire contract, and the delivery typically occurs within one year of contract execution (signed date).
Supplier	An entity from which your organization obtains inputs, which may be goods or services. A supplier may be another organization with which you have a contractual relationship, or it may be another facility owned by the same parent organization.
U.S. Department of Energy Uranium Transfer Program	The exchange of natural, enriched, or depleted uranium “tails,” or uranium enrichment services between the U.S. Department of Energy and another party.
United States	The "United States" or "U.S." includes the 50 states, Puerto Rico, the District of Columbia, Guam, the Trust Territories, and the U.S. Virgin Islands.
Uranium Compounds	Includes uranium oxide, uranium hexafluoride, and other uranium compounds.
Uranium Concentrate	The end product of the mining and milling stage in which triuranium octoxide (U3O8) is produced.
Uranium Conversion	The process whereby natural uranium in the form of an oxide is converted to natural uranium hexafluoride.
Uranium Metal (Natural)	A lustrous silver-white metal that is radioactive, malleable, ductile, and softer than steel. It contains an isotopic ratio of 99.27% U-238, 0.72 % U-235, and 0.0055 % U-234 by weight.
Uranium Metal (Depleted)	A byproduct of enrichment (tailings) or fission, DU has less than one-third of the concentration of U-235 and U-234 by weight. DU from fission (i.e., in reprocessed used nuclear fuel) is distinct because it also contains U-236.
Uranium Mill	A plant where uranium is separated from ore taken from mines, including both conventional mills and in situ recovery (ISR) plants.
Uranium Ore	Ore which contains uranium that has been obtained from conventional or in situ mining methods.
10 CFR § 40.42	Title and section of the U.S. Code of Federal Regulations that cover Nuclear Regulatory Commission’s (NRC) regulation for the expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.
BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act	

1: Organization Information

A. Provide the following information for your organization

Organization Name	
Street Address	
City	
State	
ZIP Code	
Country of Global Headquarters	
U.S. Point of Contact Name	
U.S. Point of Contact Email	
U.S. Point of Contact Phone	

B. Is this organization owned, in whole or in part, by any private or government entity? Indicate Yes/No, then identify the entities below, if applicable. List entities with at least 5% ownership.

Entity Name	Global Headquarters Street Address	Global Headquarters City	Global Headquarters State/Province	Global Headquarters Country	Ownership %

C. At the global headquarters level, identify the total number of uranium-related mining, milling, conversion, enrichment, fuel fabrication, uranium storage for third party materials, product development and design facilities, and research and development facilities that your organization currently operates, including standby/idle facilities, inside and outside the U.S.

Activity	Number of U.S. Facilities	Number of Non-U.S. Facilities
Uranium Mining		
Uranium Milling		
Uranium Conversion		
Uranium Enrichment		
Fuel Fabrication		
Product Development & Design		
Research & Development		
Uranium Storage Facility for Third Party Materials		
Other (specify)		

Comments:

2: Mergers, Acquisitions, Divestitures and Joint Ventures

Mergers, Acquisitions, and Divesitures

A.

From 2014 - 2018, record the total number of mergers, acquisitions, and divestitures related to front-end uranium fuel cycle activities, including mining, milling, conversion, enrichment, fuel fabrication, product development and design, and R&D in which your organization participated.

	Organization Name	Type of Activity	% of Equity Held by Partner Organization	Partner Organization Country Headquarters	Year Initiated	Primary Scope of Activity	Primary Purpose of Activity	Explain
1						Mining	Access to financial resources	
2						Milling	Broaden customer base	
3						Conversion	Access to technological resources	
4						Enrichment	Broaden customer base	
5						Fuel Fabrication	Creation of new technologies	
6						R&D	Improved access to foreign markets	
7						Development and Design	Improved access to U.S. markets	
8							Reduced costs	
9							Reduced lead times	
10							Risk sharing	
11							Shared/improved technology or skills	
12							Other objective/purpose (explain)	
13								
14								
15								

Joint Ventures

B.

From 2014 - 2018, record the total number of joint ventures and other business partnerships related to front-end uranium fuel cycle activities, including mining, milling, conversion, enrichment, fuel fabrication, product development and design, and R&D, including public/private partnerships, in which your organization participated.

	Organization Name	Type of Joint Venture	% of Equity Held by Organization	Organization Country Headquarters	Year Initiated	Primary Scope of Relationship	Primary Purpose of Relationship	Explain
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

Next Page

3a: Facility Information

U.S. Facilities

Identify the total number of facilities that your organization currently operates in the United States, including facilities that are standby/idle, involved in the front-end uranium fuel cycle, including mining, milling, conversion, enrichment, fuel fabrication, product development, uranium storage for third party materials, or R&D activities, including defense-related products or services. If a single facility performs multiple functions, list the facility on multiple lines and identify each separately.

A. List your organization's facilities involved in front-end uranium fuel cycle activities, including mining, milling, conversion, enrichment, or fuel fabrication, development & design, and R&D, that are located in the United States, identifying each facility's name, city, state, scope of work, operating status, whether the work is defense-related, and any expected change in operations (e.g. expansion, worker layoffs, shutdown, etc.) from 2019-2023. If the facility produced uranium in any form, report the 2018 production volume. If a single facility provides multiple functions, list the facility on separate lines, and indicate the scope of work and other relevant information separately.

	U.S. Facility Name	City	State	Scope of Activity	Facility Type	Operating Status				Defense-Related Activities?	2018 Production Volume		Expected Change 2019-2023
						Operating Status	Start Date of Standby/Idle or Decommissioning	Projected Completion/Operation	Status of Operating Permit		Product	Volume	
1				Mining	Surface - Open Pit Mining	Under development for future use							
2				Milling	Underground Mining								
3				Conversion	In-Situ Mining								
4				Enrichment	By Product Mining								
5				Fuel Fabrication	Conversion								
6				R&D	Gaseous Diffusion								
7				Development and Design	Gas Centrifuge								
8				Storage	Laser Separation								
9					Category 1 Fuel Facility								
10					Category 3 Fuel Facility								
11					Mixed Oxide Fuel Fabrication								
12					Nonpower Reactor Fuel								
13													
14													
15													

If any of your U.S. facilities are scheduled to close or may close in the 2019-2023 period, explain the circumstances of this action.

Non-U.S. Facilities

Identify the total number of facilities that your organization currently operates outside the United States, including facilities that are standby/idle, involved in the front-end uranium fuel cycle, including mining, milling, conversion, enrichment, fuel fabrication, product development, uranium storage for third party materials, or R&D activities, including defense-related products or services. If a single facility performs multiple functions, list the facility on multiple lines and identify each separately.

B. List your organization's facilities involved in front-end uranium fuel cycle activities, including mining, milling, conversion, enrichment, or fuel fabrication facilities, development & design, and R&D, that are located outside the United States, identifying each facility's name, city, country, scope of work, operating status, whether the work is defense-related, and any expected change in operations (e.g. expansion, worker layoffs, shutdown, etc.) from 2019-2023. If the facility produces uranium in any form, report the 2018 production volume. If a single facility provides multiple functions, list the facility on separate lines, and indicate the scope of work and other relevant information separately.

	Non-U.S. Facility Name	City	Country	Scope of Activity	Facility Type	Operating Status				Defense-Related Activities?	2018 Production Volume		Expected Change 2019-2023
						Operating Status	Start Date of Standby/Idle or Decommissioning	Projected Completion/Operation	Status of Operating Permit		Product	Volume	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

If any of your non-U.S. facilities are scheduled to close or may close in the 2019-2023 period, explain the circumstances of this action.

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

3b: Undeveloped Uranium Resources

List any undeveloped uranium deposits held by your organization, whether inside the U.S. or outside the U.S.

If your organization does not own any undeveloped uranium deposits inside the U.S. or outside the U.S., please select 'Not Applicable' and proceed to 3c.

U.S. Undeveloped Deposits

A.

	U.S. Location Name	County	State	Deposit Size (Acres)	Recovery Method	Reserves	Measured Indicated Resources (Pounds)	Inferred Resources (Pounds)	Estimated Per-Pound Production Cost	Total Reserves and Resources by Forward Cost (Pounds)				Factors Affecting Development		Expected Required FTEs if Developed
										Up to $30 per Pound	Up to $50 per Pound	Up to $100 Per Pound	Greater than $100 Per Pound	Factor of Highest Impact	Degree of Impact	
1														Operations Costs	High	
2														Regulatory Compliance (Non-Environmental)	Medium	
3														Environmental Compliance	Low	
4														Employment Costs	None	
5														Legal Costs		
6														Uranium Spot Prices		
7														Other		
8																
9																
10																
11																
12																
13																
14																
15																

Are there any other factors impacting your decision to develop undeveloped U.S. deposits? If yes, describe.

Non-U.S. Undeveloped Deposits

B.

	Non-U.S. Location Name	Municipality	Country	Deposit Size (Acres)	Recovery Method	Reserves	Measured Indicated Resources (Pounds)	Inferred Resources (Pounds)	Estimated Per-Pound Production Cost	Total Reserves and Resources by Forward Cost (Pounds)				Factors Affecting Development		Expected Required FTEs if Developed
										Up to $30 per Pound	Up to $50 per Pound	Up to $100 Per Pound	Greater than $100 Per Pound	Factor of Highest Impact	Degree of Impact	
1														Operations Costs	High	
2														Regulatory Compliance (Non-Environmental)	Medium	
3														Environmental Compliance	Low	
4														Employment Costs	None	
5														Legal Costs		
6														Uranium Spot Prices		
7														Other		
8																
9																
10																
11																
12																
13																
14																
15																

Are there any other factors impacting your decision to develop undeveloped non-U.S. deposits? If yes, describe.

Comments

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

3c: Changes in U.S. Facility Operations, 1999 - Present

Since 1999, identify any front-end uranium fuel cycle-related facility closings, relocations, contractions, expansions, corporate acquisitions or consolidations, or other major changes in operations (report as many as applicable). For each change, provide the location, type of facility, reasons for the change in operations (e.g., loss of market share to imports, loss/gain of market share from domestic competition, declining/increasing demand, low/high profitability, firm restructuring, other), and units of product impacted as well as number of full-time-equivalent (FTE) employees impacted. Denote reductions with a "-" symbol. If a single facility has gone through multiple changes, list the facility on multiple lines and identify each separately.

A.

	Facility Name	Activity	Type of Change	Reason for Change	Date of Change	Impacted Products			FTEs Impacted	Explain
						Type of Change	Product	Number of Impacted Units		
1		Mining	Closure			Increase				
2		Milling	Standby/Idle			Decrease				
3		Conversion	Relocation			No Change				
4		Enrichment	Contraction							
5		Fuel Fabrication	Expansion							
6		R&D	Expansion							
7		Development and Design	Significant Modernization							
8			Transfer/Sale							
9			Deferred Production							
10			Other							
11										
12										
13										
14										
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16										
17										
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20										
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22										
23										
24										
25										
26										
27										
28										
29										
30										

Answer the following questions about facility changes for part B, regarding facilities that are completely shut down, and part C, regarding facilities that are in standby/idle. After completing parts B and C, proceed to part D.

If any of your organization's facilities are *shut-down completely* , how long would it take, if possible, to restart operations at that shutdown facility? For each facility that your organization operates, indicate the factors that might inhibit restarting operations and the degree of impact for each factor. Estimate the total costs associated with each factor, and then explain your reasoning for your choices.

	Facility Name	Possible to Restart?	Estimated Time to Restart (in days)	Estimated Total Cost to Restart (in $1000s USD)	Factors Inhibiting Restart		Estimated Cost of Each Factor (in $1000s USD)	Explain
					Factor	Degree of Impact		
					Operations	High		
					Regulatory Compliance (Non-Environmental)	Moderate		
1					Environmental Compliance	Low		
					Employment	None		
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
2					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
3					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
4					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
5					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			

						Operations			
						Regulatory Compliance (Non-Environmental)			
	6					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	7					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
B.						Operations			
						Regulatory Compliance (Non-Environmental)			
	8					Environmental Compliance			
						Employment			
						Legal			
						Other			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	9					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	10					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	11					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	12					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	13					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	14					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	15					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			

C. **If any of your organization's facilities are in standby/idle, how long would it take, if possible, to restart opeartions at that facility? For each type of facility that your organization operates, indicate the factors that might inhibit operations and the degree of impact for each factor. Estimate the total costs associated with each factor, and then explain your reasoning for your choices.**

	Facility Name	Possible to Restart?	Estimated Time to Restart (in days)	Estimated Total Cost to Restart (in $1000s USD)	Factors Inhibiting Restart		Estimated Cost of Each Factor	Explain
					Factor	Degree of Impact		
					Operations			
					Regulatory Compliance (Non-Environmental)			
1					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
2					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
3					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
4					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
5					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
6					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
7					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
8					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
9					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			
					Operations			
					Regulatory Compliance (Non-Environmental)			
10					Environmental Compliance			
					Employment			
					Legal			
					Other (specify)			

						Operations			
						Regulatory Compliance (Non-Environmental)			
	11					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	12					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	13					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	14					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			
						Operations			
						Regulatory Compliance (Non-Environmental)			
	15					Environmental Compliance			
						Employment			
						Legal			
						Other (specify)			

D. Answer the following questions about postponement of decomissioning, and the costs associated with maintaining facilities in standby/idle.

1	If any of your facilities are in standby, have you filed for a postponement of decommissioning under 10 CFR § 40.42?		If yes, explain:	
2	If any of your facilities are in standby, do you plan on filing for a postponement of decommissioning under 10 CFR § 40.42 in the future?		If yes, explain:	
3	Describe the costs associated with maintaining a facility in standby.			

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

4a: U.S. Production

Identify the quantity of each uranium type produced annually at your organization's U.S. facilities for the 2014 to 2018 period. Record the projected amount of uranium your organization will produce in 2019 (estimates accepted). Record the amounts in the measurements specified in parentheses next to each type, as well as the equivalent amount in Kg U-235.

A. Uranium Ore and Concentrates

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 2612.10.00.00	Pounds of U3O8	Equivalent Amount of Kg U-235	Pounds of U3O8	Equivalent Amount of Kg U-235	Pounds of U3O8	Equivalent Amount of Kg U-235	Pounds of U3O8	Equivalent Amount of Kg U-235	Pounds of U3O8	Equivalent Amount of Kg U-235	Pounds U3O8	Equivalent Amount of Kg U-235
Uranium Ore (Pounds of U3O8)												
Uranium Concentrate (Pounds of U3O8)												

B. Natural Uranium (Not Compounds)

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 2844.10.10.00 (Metal) HTS Code: 2844.10.50.00 (Other)	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235
Uranium Metal (Kg U)												
Other (Kg U)												

C. Uranium Compounds

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 2844.10.20	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235
Uranium Compounds - Oxide (Kg U)												
Uranium Compounds - Hexafluoride (Kg U)												
Uranium Compounds - Other (Kg U)												

D. Depleted Uranium

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 2844.30.20 (Compounds and Other) HTS Code: 2844.30.50 (Metal)	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235
Depleted Uranium - Oxide (Kg U)												
Depleted Uranium - Fluorides (Kg U)												
Depleted Uranium - Other (Kg U)												
Depleted Uranium - Metal (Kg U)												

E. Enriched Uranium

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 2844.20.00	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235	Kg U	Equivalent Amount of Kg U-235
Enriched Uranium - Oxide (Kg U)												
Enriched Uranium - Hexafluoride (Kg U)												
Enriched Uranium - Other (Kg U)												

F. Fuel Assemblies

Please select 'Not Applicable' if the below category of products below is not relevant to your organization.

Type of Uranium	2014		2015		2016		2017		2018		2019 (Projected)	
HTS Code: 8401.30.00.00	Unit Specified	Equivalent Amount of Kg U-235	Unit Specified	Equivalent Amount of Kg U-235	Unit Specified	Equivalent Amount of Kg U-235	Unit Specified	Equivalent Amount of Kg U-235	Unit Specified	Equivalent Amount of Kg U-235	Unit Specified	Equivalent Amount of Kg U-235
PWR (Finished Fuel Assembly Units)												
Average Total LEU Contained in each PWR Fuel Assembly (KgU)												
BWR (Finished Fuel Assembly Units)												
Average Total LEU Contained in each BWR Fuel Assembly (KgU)												
Other (Finished Fuel Assembly Units) (specify)												
Average Total LEU Contained in each Other Fuel Assembly (KgU)												

Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

4b: U.S. Production (Continued)

Answer the following questions about U.S. production and production capacity in parts A and B below.

A. Answer the following regarding production capacity of U.S. facilities.

1	If any of your organization's facilities are not operating at full capacity, describe the factors that might influence a decision to increase production to full capacity.	
2	Describe the circumstances associated with producing at full capacity, and explain how long, on average, it might take for your organization to increase production to full capacity.	

B. For 2014 to 2018 operations at your U.S. facilities, provide the operating production capacity, licensed production capacity, actual production, average marginal production cost per unit (2018 only), and the average utilization rate to maintain profitability (2018 only). If a single facility performs multiple functions, list the facility on multiple lines and identify each separately.

	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
1			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
2			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Capacity Needed to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
3			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
4			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
5			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
6			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
7			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
8			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
9			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
10			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
11			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
12			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
13			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
14			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					
	Facility Name	Uranium Type	Production and Inventory	2014	2015	2016	2017	2018
15			Operating Production Capacity					
			Licensed Production Capacity					
			Actual Production					
			Average Marginal Production Cost per Unit					
			Average Utilization Rate Required to Maintain Profitability					

Comments:

4c: U.S. Production (Continued)

For U.S. operations, provide the U.S. sales and export sales data for the 2014 to 2018 period for the below products. Include projected data for 2019 (estimates accepted). Sales includes shipments, book transfers, swaps, and trades. Record $ in Thousands USD, e.g. $12,000.00 = survey input of $12

	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
1		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
2		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
3		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
4		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
5		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
6		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
7		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
8		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
9		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
10		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017		2019 (Projected)
11		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
13		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
13		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
14		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						
	Uranium Type	U.S. and Export Sales	2014	2015	2016	2017	2018	2019 (Projected)
15		U.S. Sales (Units)						
		U.S. Sales ($)						
		Export Sales (Units)						
		Export Sales ($)						

Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

4d: Inventory and Production Capacity

Answer the following questions about your organization's uranium bearing product inventory for the 2014 to 2018 period. Record inventory information for the end of the given calendar year, and only include inventory for which your organization has title. Do not record inventory information that is designated for a third party.

			Type of Product in Inventory at any Facility	Average Amount in Inventory	Location of Inventory		Average Length of Time in Inventory (in days)
					U.S. Location (State)	Non-U.S. Location (Country)	
A.	1	1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					
		9					
		10					
		11					
		12					
		13					
		14					
		15					
	2		Does your organization have an excess of source materials or enriched materials beyond normal business needs?				
			If yes, explain the factors contributing to the excess in inventory, and include whether the location of the inventory is primarly U.S. or Non-U.S. based. Explain what impact this has had on your business operations.				

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

5: Financials

Provide the following financial line items for your organization's uranium and nuclear fuel processing-related U.S. operations below for the 2014 to 2018 period.

A.	Income Statement (Select Line Items)	Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
1	Net Sales (and other revenue)					
2	Cost of Goods Sold					
3	Total Operating Income (Loss)					
4	Earnings Before Interest and Taxes					
5	Net Income					

	Balance Sheet (Select Line Items)	Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
6	Cash					
7	Inventories					
8	Total Current Assets					
9	Total Assets					
10	Total Current Liabilities					
11	Total Liabilities					
12	Retained Earnings					
13	Total Owner's Equity					

Note: Total Assets must equal Total Liabilities plus Total Owner's Equity.

B.	Answer the following questions related to your organization's uranium and nuclear fuel processing-related tax expenditures.					
		2014	2015	2016	2017	2018
1	Federal Taxes Paid					
2	State Taxes Paid					
3	Local Taxes Paid					

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

6: Capital Expenditures

Record your organization's uranium and nuclear fuel processing-related capital expenditures corresponding to the select categories below for the 2014 to 2018 period.

	Capital Expenditure Activity Type		Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
			2014	2015	2016	2017	2018
A	Total Capital Expenditures						
1	Machinery, Equipment, and Vehicles [as a % of A]						
2	IT, Computers, Software [as a % of A]						
3	Land, Buildings, and Leasehold Improvements [as a % of A]						
4	Other (Specify) [as a % of A]						
5	Other (Specify) [as a % of A]						
Lines 1 through 5 must total 100%							

B For the below categories, indicate whether your organization experienced significant changes (increases, decreases, or both), in uranium and/or nuclear fuel capital expenditures over the past ten years (2009-2018). Explain what factors have been affecting changes in your organization's capital expenditures from 2009 to 2018, including, but not limited to, U.S. Government or state government policies or regulations, domestic and foreign competition, and declining uranium prices.

			Yes/No	If Yes, Type of Change	Explain
1	Machinery, Equipment, and Vehicles				
2	IT, Computers, Software				
3	Land, Buildings, and Leasehold Improvements				
4	Other (Specify)				
5	Other (Specify)				

Comments:	

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7: Research & Development

A.	Has your organization conducted uranium and/or nuclear fuel processing-related research and development (R&D) in the past ten years?	If no, proceed to Section 8.

Record your organization's total R&D dollar expenditures and type of R&D expenditure for the 2014 to 2018 period.

B.

		Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
1	Total R&D Expenditures					
2	Basic Research [as a % of B1]					
3	Applied Research [as a % of B1]					
4	Product/Process Development [as a % of B1]					
5	Total of 2 - 4 [must equal 100%]	0%	0%	0%	0%	0%

Identify your organization's R&D funding sources, by percent total of R&D dollars sourced.

C.

		Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
1	Total R&D Funding Sources					
2	Internal/Self-Funded/IRAD [as a % of C1]					
3	Total Federal Government [as a % of C1]					
4	Total State and Local Government [as a % of C1]					
5	Universities - Public and Private [as a % of C1]					
6	U.S. Industry, Venture Capital, Non-Profit [as a % of C1]					
7	Non-U.S. Investors (as a percent of C1)					
8	Other (specify here)					
9	Total of 2 - 8 (must equal 100%)	0%	0%	0%	0%	0%

D.	1	For 2014 to 2018, did your organization experience constraints (for example, inadequate revenue) on U.S. R&D activities?		If yes, explain and identify additional R&D activities that would occur absent those constaints.

E. From 2009 to 2018, list any U.S. exploration, drilling, mining, uranium recovery applications, or other permits (Federal, State, or Local) relating to the nuclear fuel cycle that your organization currently owns, or for which your organization currently has a pending application. Include the regulatory authority granting the permit, the type and description of the permit, the design type of the facility, the application date, the application status, and the location of the facility.

	Regulatory Authority	Type of Permit	Permit Description	Full Length of Permitting Process (Years)	Total Estimated Cost of Permitting Process	Design Type	Application Date	Application Status	Facility Location (City, State)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

D.	Has your organization encountered obstacles with the permitting process?		If yes, indicate the type of difficulty and explain below.
	Explain:		
E.	Have your licensing or permitting fees increased in the last five years? If so, explain.		
F.	Does your organization have any suggestions that would help improve the permitting process?		
	Comments:		

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

Section 8: Imports

In Section 8 you will be asked to identify the suppliers, country of origin, manufacturer, end use, value, and volume for imports of uranium products. This information is subcategorized by different combinations of imports and end users. For the purpose of this survey, the different combinations of imports and end users of import subcategories have been divided into 6 general categories, as detailed below.

The list below contains links that can move you to a particular product and/or service segment.**Identify each general category in which your organization imports uranium products.** After completing this page you may skip to the sections with the import category that are applicable to your organization, but be sure to review all segments to ensure you do not omit any required information.

Imports categorized under each subcategory:

Subcategories A: **Only complete if your organization provides milling services.** List any uranium material imported into the U.S. that your organization receives for milling services. Subcategory A should include both material imported into the U.S. that is then re-exported out of the U.S. after milling services are completed and material imported into the U.S. for milling services that then stays in the U.S. after milling services are completed.

Subcategories B: **Only complete if your organization provides conversion services.** List any uranium material imported into the U.S. that your organization receives for conversion services. Subcategory B should include both material imported into the U.S. that is then re-exported out of the U.S. after conversion services are completed and material imported into the U.S. for conversion services that then stays in the U.S. after conversion services are completed.

Subcategories C: **Only complete if your organization provides enrichment services.** List any uranium material imported into the U.S. that your organization receives for enrichment services. Subcategory B should include material imported into the U.S. that is then re-exported out of the U.S. after enrichment services are completed and material imported into the U.S. for enrichment services that then stays in the U.S. after enrichment services are completed.

Subcategories D: **Only complete if your organization provides fuel fabrication services.** List any uranium material imported into the U.S. that your organization receives for fuel fabrication services. Subcategory C should include material imported into the U.S. that is then re-exported out of the U.S. after fuel fabrication services are completed and material imported into the U.S. for fuel fabrication services that then stays in the U.S. after fuel fabrication services are completed.

Subcategory E: **Only complete if your organization has imported uranium into the U.S. for the sole purpose of increasing commercial inventory and/or for market resale.**

Subcategory F: **Only complete if your organization has imported uranium into the U.S. for any other reason not previously covered.**

Subcategory	Product and Service Category	Applicable To Your Organization
A	Uranium imported into the U.S. for milling services.	
B	Uranium imported into the U.S. for conversion services.	
C	Uranium imported into the U.S. for enrichment services.	
D	Uranium imported into the U.S. for fuel fabrication services.	
E	Uranium imported into the U.S. for commercial inventory and/or market resale.	
F	Uranium imported into the U.S. for any form for a reason not previously covered.	

8a: Imports - Milling

Only complete if your organization provides milling services. If your organization receives uranium that was imported into the U.S. for milling services which is then re-exported to a foreign country for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If your organization receives uranium that was imported into the U.S. for milling services that stays in the U.S. after milling services are complete for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If your organization does not import uranium in any form for use in the nuclear fuel cycle, please select "Not Applicable" and proceed to Section 8B.

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

A

	Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
									Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1						Yes		Commercial										
2						No		Research										
3								U.S. Government (Non-defense)										
4								U.S. Government (Defense)										
5								Other										
6								Unknown										
7																		
8																		
9																		
10																		

Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

B

	Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
									Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																		
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Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

C

	Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
									Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																		
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Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

D

	Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
									Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																		
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Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																		
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
F	1																		
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	5																		
	6																		
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	9																		
	10																		

Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																		
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	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																		
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	4																		
	5																		
	6																		
	7																		
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	9																		
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
I	1																		
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	3																		
	4																		
	5																		
	6																		
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	8																		
	9																		
	10																		

Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
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	9																		
	10																		

Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																		
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	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																		
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	5																		
	6																		
	7																		
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	9																		
	10																		

Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Exporting Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
N	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
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	9																		
	10																		

Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
O	1																		
	2																		
	3																		
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	5																		
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	8																		
	9																		
	10																		

Comments:	

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8b: Imports - Conversion Services

Only complete if your organization provides conversion services. If your organization receives uranium that was imported into the U.S. for conversion services which is then re-exported to a foreign country for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If your organization receives uranium that was imported into the U.S. for conversion services that stays in the U.S. after conversion services are complete for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If this category of imports is not relevant to your organization, please select 'Not Applicable' and proceed to section Section 8cC

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1						Yes		Commercial										
	2						No		Research										
	3								Government (Civilian)										
	4								Government (Defense)										
	5								Other										
	6																		
	7																		
	8																		
	9																		
	10																		

Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
B	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
C	1																		
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	5																		
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	9																		
	10																		

Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
D	1																		
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	3																		
	4																		
	5																		
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	9																		
	10																		

Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																		
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	3																		
	4																		
	5																		
	6																		
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
F	1																		
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	3																		
	4																		
	5																		
	6																		
	7																		
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	9																		
	10																		

Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																		
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	3																		
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Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																		
	2																		
	3																		
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																		
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Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																		
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Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

8c: Imports - Enrichment Services

Only complete if your organization provides enrichment services. If your organization receives uranium that was imported into the U.S. for enrichment services which is then re-exported to a foreign country for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If your organization receives uranium that was imported into the U.S. for enrichment services that stays in the U.S. after enrichment services are complete for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If this category of imports is not relevant to your organization, please select 'Not Applicable' and proceed to section Section 8D.

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1					Yes	Yes		Commercial										
	2					No	No		Research										
	3								Government (Civilian)										
	4								Government (Defense)										
	5								Other										
	6																		
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Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
B	1																		
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Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																		
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Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																		
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																		
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Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																		
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Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																		
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Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
O	1																		
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Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

8d: Imports - Fuel Fabrication Services

Only complete if your organization provides fuel fabrication services. If your organization receives uranium that was imported into the U.S. for fuel fabrication services which is then re-exported to a foreign country for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If your organization receives uranium that was imported into the U.S. for fuel fabrication services that stays in the U.S. after fuel fabrication services are complete for final use, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If this category of imports is not relevant to your organization, please select 'Not Applicable' and proceed to Section 8E.

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1					Yes	Yes		Commercial										
	2					No	No		Research										
	3								Government (Civilian)										
	4								Government (Defense)										
	5								Other										
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Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																		
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																		
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Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																		
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Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																		
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Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																		
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Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
N	1																		
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	9																		
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Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
O	1																		
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	9																		
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Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

8e: Imports - Commercial Inventory and/or Market Resale

If your organization imports directly or receives uranium that has been imported into the U.S., in any form, for the sole purpose of increasing commercial inventory and/or for market resale, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If this category of imports is not relevant to your organization, please select 'Not Applicable' and proceed to Section 8F.

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1					Yes	Yes		Commercial										
	2					No	No		Research										
	3								Government (Civilian)										
	4								Government (Defense)										
	5								Other										
	6																		
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Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
C	1																		
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Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																		
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																		
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Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																		
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
I	1																		
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Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																		
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Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																		
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Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																		
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Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																		
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Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
N	1																		
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Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	2014		2015		2016		2017		2018	
										Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
O	1																		
	2																		
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	9																		
	10																		

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

8f: Imports - Other

If your organization imports uranium into the U.S. in any form for any other reason not specifically covered in the preceding sections, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. If the material is received by book transfer or flag swap from the same organization, record the information on separate lines. Exporting organizations should include any individual brokers and/or traders that your organization purchases uranium products from.

If this category of imports is not relevant to your organization, please select 'Not Applicable' and proceed to Section 8G.

PLEASE NOTE THE UNITS OF MEASURE IN THE HEADINGS. E.G. URANIUM ORE SHOULD BE RECORDED IN POUNDS.

Uranium Ore (Pounds)

Identify your organization's total number of suppliers for Uranium Ore. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1					Yes	Yes		Commercial											
	2					No	No		Research											
	3								Government (Civilian)											
	4								Government (Defense)											
	5								Other											
	6																			
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	8																			
	9																			
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Uranium Concentrate (Pounds U3O8)

Identify your organization's total number of suppliers for Uranium Concentrate. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
B	1																			
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Uranium Metal (KgU)

Identify your organization's total number of suppliers for Uranium Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Natural Uranium - Not Compounds (KgU)

Identify your organization's total number of suppliers for Natural Uranium - Not Compounds. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
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Uranium Compounds - Oxide (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																			
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	3																			
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Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
F	1																			
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Uranium Compounds - Other (KgU)

Identify your organization's total number of suppliers for Uranium Compounds - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																			
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Depleted Uranium - Oxide (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																			
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Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Fluorides. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
I	1																			
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Depleted Uranium - Other (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																			
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Depleted Uranium - Metal (KgU)

Identify your organization's total number of suppliers for Depleted Uranium - Metal. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																			
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Enriched Uranium Oxide (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Oxide. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																			
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	9																			
	10																			

Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Hexafluoride. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
M	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	10																			

Enriched Uranium - Other (KgU)

Identify your organization's total number of suppliers for Enriched Uranium - Other. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
N	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	10																			

Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of suppliers for Fuel Assemblies. Where necessary, input 0.

		Supplier	Supplier Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from exporting company)	Flag Swap?	Book Swap?	If re-exported outside of the U.S., provide country of final use	End-Use	Explanation for Import	2014		2015		2016		2017		2018	
											Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
O	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	10																			

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

9a: Customers and Contracts

A For 2009-2013 and 2014-2018, record the number of direct U.S.-based and non-U.S.-based customers for uranium or fuel products.

2009-2013		2014-2018	
U.S.	Non-U.S.	U.S.	Non-U.S.

B Identify your organization's top 15 current customers (by sales volume). For each current/active customer, enter type of customer, type of contract, contract dates, expected renewal, type and supply of uranium. For country of origin, please indicate the country from which the majority, by volume, of the uranium your organization supplies was originally mined.

	Customer Name	Customer's HQ (Country)	Type of Customer	Type of Contract	Contract Dates		End-Use		Renewal Expected?	Type and Supply of Uranium				Amount Supplied to Date	Estimated Percent of Total 2018 Sales Attributable to the Active Contract	Explain
					Start Date	End Date	End-user HQ (country)	End-use (if known)		Type	Country of Uranium Ore Origin	Minimum Price for Contract	Maximum Price for Contract			
1								Commercial								
2								Research								
3								Government (Civilian)								
4								Government (Defense)								
5								Other								
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

If you indicated that some of your organization's contracts were not expected to be renewed, explain.

C. For your organization's inactive or former customers from 2009 to 2018, identify the type of customer, type of contract, contract dates, whether the contract was canceled, not renewed, or other, and the reason why. Also identify the type and supply of uranium, as well as the average price per unit. For country of origin, please indicate the country from which the majority, by volume, of the uranium your organization supplied was originally mined.

	Customer Name	Type of Customer	Type of Contract	Contract Dates		Reason for Contract End	Explain Reasoning	Type and Supply of Uranium				Amount Supplied Over Duration of Contract	Explain
				Start Date	End Date			Type	Country of Uranium Ore Origin	Minimum Price for Contract	Maximum Price for Contract		
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

D From 2009-2013, 2014-2018, and 2019-2023, record the number and dollar value of your organization's contracts (spot, short-term, mid-term, long-term) for uranium or fuel products.

	Contract Type	2009-2013								2014-2018								2019-2023							
		Spot		Short-term		Mid-term		Long-term		Spot		Short-term		Mid-term		Long-term		Spot		Short-term		Mid-term		Long-term	
		Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value
1	U.S.																								
2	Non-U.S.																								

				Spot		Short-term		Mid-term		Long-term	
				Number	Value	Number	Value	Number	Value	Number	Value
3	Do you have contracts beyond 2023?	Y/N	If yes, complete the matrix to the right.								
4	Has your organization experienced difficulty negotiating, renegotiating, or extending long-term contracts?		If yes, explain any difficulties.								

Comments:

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9b: Customers and Contracts (Continued)

From 2014 to 2018, did your organization operate U.S. mining or milling facilities?						
A.	If no, proceed to Part B. If yes, complete Part A.					
	1	Has your organization used product (U3O8) purchased on the spot market in order to fulfill contracts?				
	2	If yes, indicate the percentage of U3O8 contract obligations that were fulfilled using product (U3O8) purchased on the spot market for the 2014 to 2018 period.				
		2014	2015	2016	2017	2018
	3	Indicate the total amount of uranium purchases, in pounds of U3O8, that your organization purchased on the spot market for the 2014 to 2018 period.				
		2014	2015	2016	2017	2018
	4	What average price per pound of uranium concentrate does your organization need in order to cover fully loaded costs, such as overhead, marketing, depreciation, depletion, amortization, and operating costs? Explain your reasoning.				
B	From 2014 to 2018, did your organization provide U.S.-based enrichment services?				If yes, complete the questions in Part B.	
	1	Has your organization re-enriched tailings, whether from previous enrichment activities or adjusting current tails assay, and then re-sold the product?				
	2	If yes, indicate the percentage of your revenue that came from sales of re-enriched tailings for the 2014 to 2018 period.				
		2014	2015	2016	2017	2018
	3	Provide the annual quantity, in KgU, of re-enriched tailings sales for the 2014 to 2018 period.				
		2014	2015	2016	2017	2018
	4	What factors led your organization to begin selling re-enriched tails? Discuss the role that excess inventory has played in causing your organization to re-enrich tails.				
	5	If this is a new business activity, describe the factors that caused your organization to start selling re-enriched tails.				
	6	How would an increase in uranium spot prices affect your sales of re-enriched tails?				
Comments:						

9c. Third Party Storage

If your organization provides storage of uranium in any form for other parties, identify the suppliers and the subsequent country origin of the material for each of the below products for the 2014 to 2018 period. This is material for which your organization **does not have title**. Include material stored for brokers and/or traders, and record if the material stored by your organization has been involved in a book swap.

If your organization does not provide storage of uranium in any form, please select 'Not Applicable.'	

Uranium Ore (Pounds)

Identify the total number of consigners of Uranium Ore to your organization. Where necessary, input 0.	

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use (If Known)	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
A	1					Yes	Commercial										
	2					No	Research										
	3						Government (Civilian)										
	4						Government (Defense)										
	5						Other										
	6																
	7																
	8																
	9																
	10																

Uranium Concentrate (Pounds U3O8)

Identify the total number of consigners of Uranium Concentrate to your organization. Where necessary, input 0.	

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
B	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Uranium Metal (KgU)

Identify the total number of consigners of Uranium Metal to your organization. Where necessary, input 0.	

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
C	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Natural Uranium - Not Compounds (KgU)

Identify the total number of consigners of Natural Uranium - Not Compounds to your organization. Where necessary, input 0.	

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
D	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Uranium Compounds - Oxide (KgU)

Identify the total number of consigners of Uranium Compounds - Oxide to your organization. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
E	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Uranium Compounds - Hexafluoride (KgU)

Identify your organization's total number of consigners of Uranium Compounds - Hexafluoride. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
F	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Uranium Compounds - Other (KgU)

Identify your organization's total number of consigners of Uranium Compounds - Other. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
G	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Depleted Uranium - Oxide (KgU)

Identify your organization's total number of consigners of Depleted Uranium - Oxide. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
H	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Depleted Uranium - Fluorides (KgU)

Identify your organization's total number of consigners of Depleted Uranium - Fluorides. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
I	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Depleted Uranium - Other (KgU)

Identify your organization's total number of consigners of Depleted Uranium - Other. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
J	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Depleted Uranium - Metal (KgU)

Identify your organization's total number of consigners of Depleted Uranium - Metal. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
K	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Enriched Uranium Oxide (KgU)

Identify your organization's total number of consigners of Enriched Uranium - Oxide. Where necessary, input 0.

		Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
								Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
L	1																
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	10																

Enriched Uranium Hexafluoride (KgU)

Identify your organization's total number of consigners of Enriched Uranium - Hexafluoride. Where necessary, input 0.

M

	Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
							Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Enriched Uranium - Other (KgU)

Identify your organization's total number of consigners of Enriched Uranium - Other. Where necessary, input 0.

N

	Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
							Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

Identify your organization's total number of consigners of Fuel Assemblies. Where necessary, input 0.

O

	Consigning Organization	Consigning Organization Headquarters	Country of Uranium Ore Origin	Manufacturer/Processor (if different from consigning organization)	Book Swap?	End-Use	2014		2015		2016		2017		2018	
							Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)	Units	Value ($USD)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Comments:

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10: Employment

Record the total number of full time equivalent (FTE) employees and contractors for the 2014 to 2018 period.

		2010	2014	2015	2016	2017	2018	2019 (Projected)
A	FTE Employees							
	FTE Contractors							

Record the total number of employees for each occupation type below for 2010 and 2014 to 2018. Include projected data for 2019 numbers (estimates accepted).

	Occupation	2010	2014	2015	2016	2017	2018	2019 (Projected)
B	Administrative, Management, Legal Staff, IT Staff							
	Analysts, Evironmental Compliance, Tailings Management Operators, Radiation Safety Technicians							
	Engineers, Scientists, Geologists, Geochemists, Geophysicists, Chemical Metallurgists							
	Electricians, Welders, Technicians, Operating Staff, Driller, Logger							
	Millwrights, Miners, Mill Operator, Mill Maintenance, Wellfield Operator, Wellfield Maintenance							
	Marketing and Sales							
	Other							

Answer the following questions about employment difficulties, workforce age, educational requirements, vacancies, and changes in employment for the 2014 to 2018 period.

	Occupation		Difficulty	Explanation for Difficulty, if Applicable	FTEs Impacted (2014 - 2018)		Current Average Age of Worker (2018)	Formal Education Requirements	On the Job Training Requirements (OTJ)	Current Number of Vacancies (2018)	Average Weeks Vacant	Explanation
					Type of Impact	If FTEs were impacted due to changes in facility operations, indicate the number of employees impacted						
C	Administrative, Management, Legal Staff, IT Staff		Hiring					No Formal Educational Credential	No OTJ Required			
	Analysts, Evironmental Compliance, Tailings Management Operators, Radiation Safety Technicians							High School Diploma or Equivalent	Less Than A Month of OTJ Required			
	Engineers, Scientists, Geologists, Geochemists, Geophysicists, Chemical Metallurgists		Retaining					Associate's Degree	Between 1 Month and 6 Months of OTJ Required			
	Electricians, Welders, Technicians, Operating Staff, Driller, Logger		Both					Bachelor's Degree	Between 6 Months to 1 Year of OTJ Required			
	Millwrights, Miners, Mill Operator, Mill Maintenance, Wellfield Operator, Wellfield Maintenance		None					Master's Degree	Between 1 and 2 Years of OTJ Required			
	Marketing and Sales							Doctoral or Professional Degree	Over 2 Years of OTJ Required			
	Other	(specify here)										

D	Does the industry experience any amount of workforce cross-over between commercial and U.S. government uranium activities?		If yes, explain below.
E	Are the skills associated with the workforce in your organization transferable to other non-uranium industries?		If yes, explain below.
F	If you resumed operations at an idled facility, do you reasonably anticipate being able to hire or rehire workers? If so, in what in timeframe?"		
G	Does the geographic location of your organization's facilities play any role in the challenges in hiring, retaining, and rehiring employees?		If yes, explain below and specify the categories of employees that this challenge pertains to.
H	Does your organization utilize or provide consulting services that assist in optimizing core business processes relating to your organization's role in the nuclear fuel cycle?		If yes, describe the types of firms you work with, and the substance of the consulting work below. Consider the degree of integration of the uranium and nuclear fuel industries in your answer.

Comments:	

11a: Competition and Demand Trends

A. From your organization's perspective, explain how demand within the United States and outside of the United States for uranium products and nuclear fuel assemblies has changed from 2009 to 2018. Explain any trends and describe the principal factors that have affected these changes in demand.

Market	Overall Change	Explanation and Factors
Within the United States		
Outside the United States		

B. From 2009 to 2018, indicate whether import competition has affected your U.S. manufacturing operations, sales, employment, planned expansions, etc. with respect to the production of any type of uranium products or nuclear fuel assemblies. Expain your answer below.

	Item	Yes/No	Explain
1	Manufacturing Operations		
2	Sales		
3	Employment		
4	Planned Expansions		
5	Other (specify)		

C. From 2009 to 2018, has your organization experienced any negative effects on its return on investment or its growth, investment, ability to raise capital, existing development and production efforts, or the scale of capital investments as a result of imports of any type of uranium products or nuclear fuel assemblies into the United States? Indicate Yes/No to the right and explain below.

	Item	Yes/No	Explain
1	Return on Investment		
2	Investments		
3	Ability to Raise Capital		
4	Existing Development/ Production Efforts		
5	Scale of Capital		
6	Other (specify)		

D. What is the current/future impact on your organization of competition in the U.S. market for uranium products or nuclear fuel assemblies originating from countries with state-owned enterprises, such as Russia, Kazakhstan, Uzbekistan, and China?

E.

1. Describe the top five most significant challenges to the competitive position of your organization in the U.S. uranium market.
   1.
   2.
   3.
   4.
   5.
2. Describe the top five most significant challenges to the competitive position of your organization in the non-U.S. uranium market.
   1.
   2.
   3.
   4.
   5.

Comments:	

11b: Competitors

A. For each of the following factors, indicate whether uranium producers or nuclear fuel fabricators located inside the U.S. or outside the U.S. possess the competitive advantage, specify the country with the perceived advantage, and explain your reasoning.

Factor	U.S. or Non-U.S. Location with Advantage	Country with Perceived Advantage	Explain
Labor Costs			
Environmental Compliance Costs			
Material Costs			
Equipment Costs			
Facility Costs			
Supply of Skilled Workers			
Overall Finished Product Price			
Quality			
Lead Time			
Reduced Process Variability			
Reduced Cost			
Safety Requirements Costs			
Government Support/Subsidies			
Currency Valuation			
Regulatory Costs (Non-Environmental)			
Other (specify here)			
Other (specify here)			

B. Identify your organization's leading U.S. competitor in the manufacture of any type of uranium, and identify their primary competitive attribute.

Top U.S. Competitors

	Competitor Name	State	Global Headquarters Country	Primary Competitive Attribute	Explain
1					
2					
3					
4					
5					

Identify your organization's leading non-U.S. competitor in the manufacture of any type of uranium, and identify their primary competitive attribute.

Top Non-U.S. Competitors

	Competitor Name	Country	Global Headquarters Country	Primary Competitive Attribute	Explain
1					
2					
3					
4					
5					

Comments:

11c: Competitive Challenges

Please answer the following questions, and explain your answer.

		Russian/China Presence on the Global Uranium Market	-Yes/No-	Explain
A	1	Have restrictions on imports of Russian uranium affected your organization?		
	2	Would your organization's posture be affected by an increased Russian presence in the U.S. or global market?		
	3	Will China's increasing global presence in the nuclear fuel sector affect your organization?		

		Current Competitiveness	-Yes/No-	Explain
B.	1	Has your organization changed its pricing practices in the past ten years?		
	2	Has your organization engaged in any cost-cutting measures in order to compete with cheaper imports of uranium products and volatile prices?		
	3	Has your organization made significant operational or strategic changes in order to better compete in the uranium market?		
	4	Has the increasing presence of natural gas-fired power plants affected your organization's competitiveness?		
	5	Have renewable energy technologies (e.g. solar and wind) affected your organization's competitiveness?		
	6	Does the uranium concentration in ore recovered from U.S. mines impact your organization's competitiveness?		
	7	Has your organization been impacted by the lack of a U.S.-technology based civilian enrichment facility?		

		International Markets and Factors	-Yes/No-	Explain
C.	1	While the nuclear power sector is declining domestically in terms of number of facilities, it is growing globally. Do you plan to participate, or increase participation, in the global uranium market?		
	2	Apart from potential government subsidies, do you believe that foreign uranium producers operate at lower costs than U.S. producers?		
	3	Do you consider all international suppliers of uranium products to your organization reliable?		
	4	Do other countries' environmental standards give your international competitors an advantage? Describe.		
	5	Does the nuclear industry face challenges in complying with the Foreign Corrupt Practices Act (FCPA) when purchasing imported uranium products from foreign countries? Identify any specific countries where these practices, as defined in the FCPA, are prevalent.		
	6	Does your organization know of any direct subsidies or other state support received by your international competitors?		
	7	Has the 2011 Fukushima disaster impacted your organization's operations? Explain.		
	8	Do uranium producers operating in foreign market economies (e.g. Canada, Australia) have competitive advantages (e.g. geology, business practices, logistics chain) over U.S. producers?		
	9	Do regulatory or legislative frameworks give operators in foreign market economies (e.g. Canada, Australia) advantages over U.S. producers?		
		Domestic Operations and Factors	**-Yes/No-**	**Explain**
	1	Does the United States currently have the uranium resources and associated infrastructure available to support U.S. national defense and critical infrastructure needs for the foreseeable future? If no, what actions do you believe are necessary to enhance the U.S. nuclear infrastructure.		
	2	If your organization operates a uranium mill, have you had to rely on "alternative feed material" instead of "traditional ore" to support your business? If so, is it a sustainable business model?		

D	3	Have any U.S. regulatory regime changes in the last ten years impacted your organization's current competitiveness? Please list specific changes.		
	4	Have uranium market conditions affected your organization's ability to obtain financing for operations to remain solvent?		
	5	Has the U.S. Department of Energy's program of selling off natural uranium and low enriched uranium (LEU) stocks affected your organization?		
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Previous Page

12: Certification

The undersigned certifies that the information herein supplied in response to this questionnaire is complete and correct to the best of his/her knowledge. It is a criminal offense to willfully make a false statement or representation to any department or agency of the United States Government as to any matter within its jurisdiction (18 U.S.C. 1001 (1984 & SUPP. 1197)).

Once your organization has completed this survey, save a copy and submit it via email to Uranium232@bis.doc.gov. Be sure to retain your survey for your records and to facilitate any necessary edits or clarifications.

Organization Name	
Organization's Internet Address	
Name of Authorizing Official	
Title of Authorizing Official	
E-mail Address	
Phone Number and Extension	
Date Certified	

In the box below, provide any additional comments or any other information you wish to include regarding this survey assessment.

How many hours did it take to complete this survey?	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Appendix E

Next Page

OMB Control Number: 0694-0120
Expiration Date: November 30, 2019

Section 232 National Security Investigation: The Effect of Imports of Uranium on the National Security

Nuclear Power Operator Survey

SCOPE OF ASSESSMENT

The U.S. Department of Commerce, Bureau of Industry and Security (BIS), Office of Technology Evaluation (OTE), is conducting a survey of the U.S. nuclear power operator and end-user sector. The survey results will be used to support an ongoing investigation of the effect of imports of uranium on the national security initiated under Section 232 of the Trade Expansion Act of 1962, as amended.

The principal goal of this survey is to assist the U.S. Department of Commerce in determining whether uranium is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security. Information collected will include facilities and production data, mergers and acquisitions, joint ventures, trade flows, supply chain networks, sales and demand data, employment information, conditions of domestic and global competition, research and development, and other financial factors. The resulting data will provide the U.S. Department of Commerce detailed uranium industry information that is otherwise not publicly available and needed to effectively conduct this Section 232 investigation.

RESPONSE TO THIS SURVEY IS REQUIRED BY LAW

A response to this survey is required by law (50 U.S.C. Sec. 4555). Failure to respond can result in a maximum fine of $10,000, imprisonment of up to one year, or both. Information furnished herewith is deemed confidential and will not be published or disclosed except in accordance with Section 705 of the Defense Production Act of 1950, as amended (50 U.S.C. Sec. 4555). Section 705 prohibits the publication or disclosure of this information unless the President determines that its withholding is contrary to the national defense. Information will not be shared with any non-government entity, other than in aggregate form. The information will be protected pursuant to the appropriate exemptions from disclosure under the Freedom of Information Act (FOIA), should it be the subject of a FOIA request.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

BURDEN ESTIMATE AND REQUEST FOR COMMENT

Public reporting burden for this collection of information is estimated to average 14 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information to BIS Information Collection Officer, Room 6883, Bureau of Industry and Security, U.S. Department of Commerce, Washington, D.C. 20230, and to the Office of Management and Budget, Paperwork Reduction Project (OMB Control No. 0694-0120), Washington, D.C. 20503.

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

Table of Contents

I	Cover Page
II	Table of Contents
III	General Instructions
IV	Definitions
1	Organization Information
2	Mergers & Acquisitions
3a	Facility Information
3b	Facility Inventory
3c	Facility Refueling Cycle
3d	Changes in Facility Operations, 1999-2018
4	Production
5	Permits
6	Financials
7	Capital Expenditures
8	Research & Development
9	Deliveries, 2014-2018
10	Future Deliveries, 2019-2023
11	Projected Shipments to Enrichment Services Providers and Unfilled Uranium Requirements, 2019-2028
12	Logistics
13	Employment
14a	Market Trends
14b	Competitive Hardships
15	Certification

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

General Instructions	
A.	Your organization is required to complete this survey of the U.S. nuclear power generation sectors using an Excel template, which can be downloaded from the BIS website: http://www.bis.doc.gov/nuclearoperator If you are unable to download the survey document, at your request, BIS survey support staff will e-mail the Excel survey template directly to you. For your convenience, a PDF version of the survey and required drop-down content is available on the BIS website to aid internal data collection. **DO NOT SUBMIT** the PDF version of the survey as your response to BIS. Should this occur, your organization will be required to resubmit the survey in the requested Excel format.
B.	Respond to every question. Surveys that are not fully completed will be returned for completion. Use the comment boxes to provide any information to supplement responses provided in the survey form. Make sure to record a complete answer in the cell provided, even if the cell does not appear to expand to fit all of the information. **DO NOT CUT AND PASTE RESPONSES WITHIN THIS SURVEY OR PASTE IN RESPONSES FROM OUTSIDE THE SURVEY.** Survey inputs should be completed by typing in responses or by using a drop-down menu. The use of cut and paste can corrupt the survey template. If your survey response is corrupted as a result of cut and paste responses, your survey will be rejected and your organization must immediately resubmit the survey.
D.	**Do not disclose any USG classified information in this survey form.**
E.	Upon completion of the survey, final review, and certification, **transmit the survey document via e-mail to**: Uranium232@bis.doc.gov
F.	Questions related to the survey should be directed to BIS survey support staff at Uranium232@bis.doc.gov E-mail is the preferred method of contact. You may also speak with a member of the BIS survey support staff by calling (202) 482-3800.
G.	For questions related to the overall scope of this Section 232 Investigation, contact Uranium232@bis.doc.gov or: Brad Botwin, Director, Industrial Studies Office of Technology Evaluation, Bureau of Industry and Security, Room 1093 U.S. Department of Commerce 1401 Constitution Avenue, NW Washington, DC 20230 DO NOT submit completed surveys to Mr. Botwin's postal or personal e-mail address. All surveys must be submitted electronically to: Uranium232@bis.doc.gov

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Definitions	
Term	**Definition**
Applied Research	A systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met. This activity includes work leading to the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes.
Authorizing Official	An executive officer of the organization or business unit or another individual who has the authority to execute this survey on behalf of the organization.
Basic Research	A systematic, scientific study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts.
Boiling Water Reactor (BWR)	A common nuclear power reactor design in which water flows upward through the core, where it is heated by fission and allowed to boil in the reactor vessel. The resulting steam drives turbines, which activate generators to produce electrical power.
Capital Expenditures	Investments made by an organization in buildings, equipment, property, and systems where the expense is depreciated. This does not include expenditures for consumable materials, other operating expenses, and salaries associated with normal business operations.
Customer	Any organization (external or internal entity) for which your organization manufactures/processes any product comprised of, or containing, uranium in any form.
Defense-related Activities	Any product or service that your organization produces that is ultimately used by the U.S. government for defense purposes, whether by the armed services, the Department of Defense, or any other U.S. government entity.
Depleted Uranium	Uranium in which the precentage fraction by weight of U-235 is less than 0.711 percent.
Development	The design, simulation, and testing of a prototype, including experimental software or hardware systems, to validate technological feasibility or concept of operation in order to reduce technological risk, or provide test systems prior to production approval.
Enriched Uranium	Includes enriched uranium oxide, enriched uranium hexafluoride, and other enriched uranium. Uranium enriched in U-235 and its compounds: alloys, dispersions (including cermets), ceramic products, and mixtures containing uranium enriched in U-235.
Exports	Shipments to destinations outside the United States, including shipments to Canada and Mexico.
Facility	A building or the minimum complex of buildings or parts of buildings in which an organization operates to serve a particular function, producing revenue, and incurring costs for the company. A facility may produce an item of tangible or intangible property or may perform a service. It may encompass a floor or group of floors within a building, a single building, or a group of buildings or structures. Often, a facility is a group of related locations at which organization employees work, together constituting a profit-and-loss center for the company, and it may be identified by a unique DUNS number.
Foreign Corrupt Practices Act of 1977 (FCPA) 15 U.S.C. §§ 78dd-1	The Foreign Corrupt Practices Act (FCPA), enacted in 1977, generally prohibits the payment of bribes to foreign officials to assist in obtaining or retaining business. The FCPA can apply to prohibited conduct anywhere in the world and extends to publicly traded companies and their officers, directors, employees, stockholders, and agents. Agents can include third party agents, consultants, distributors, joint-venture partners, and others.
Fuel Assemblies	A structured group of fuel rods (long, slender, metal tubes containing pellets of fissionable material, which provide fuel for nuclear reactors).
Fuel Elements	Includes fuel rods or fuel pellets, non-irradiated, and other parts thereof.
Fuel Fabrication	Fuel fabrication is the last step in the process of turning uranium into nuclear fuel rods, wherby enriched UF6 is converted to uranium dioxide powder that is pressed into pellets and inserted into fuel rods, grouped together to form fuel assemblies.

Full Time Equivalent (FTE) Employees	Employees who work for 40 hours in a normal work week. Convert part-time employees into "full time equivalents" by taking their work hours as a fraction of 40 hours.
Global Headquarters	A location that serves as the organization's hub of worldwide operations with all global branches or divisions reporting to it.
Harmonized Tariff Schedule (HTS)	A 10-digit numbering system that classifies a good based on its name, use, and/or the material used in its construction. The number provides Customs and Border Protection (CBP) with a standardized method of tracking all merchandise imported into the United States and sets out the tariff rates and statistical categories.
Import Value	Values reported should be landed, duty paid values at the U.S. port of entry, including ocean freight and insurance costs, brokerage charges, and import duties (i.e., all charges except inland freight in the United States).
Inventory	The goods or materials an organization holds for its own use or for the ultimate goal of sale, or disposition or future conversion, enrichment, fabrication, or other use. This is material to which your organization has title; this does not include holding material for third-party use or storage.
Natural Uranium	Uranium with the same isotopic ratio as found in nature. This includes uranium ore and concentrates (U3O8) and natural uranium hexafluoride (UF6).
Non-U.S. Facility	A facility that is physically located outside of the United States.
Organization	A company, firm, laboratory, or other entity that owns or controls one or more U.S. establishment) or facility capable of designing and/or manufacturing products in the nuclear power generation sector.
Pressurized Water Reactor (PWR)	A common nuclear power reactor design in which very pure water is heated to a very high temperature by fission, kept under high pressure (to prevent it from boiling), and converted to steam by a steam generator. The resulting steam is used to drive turbines, which activate generators to produce electrical power.
Product/Process Development	Conceptualization and development of a uranium or nuclear fuel-related product or system prior to the production of the product for customers (i.e., utilities, governmental agencies etc.).
Production	The process of transforming inputs (raw materials, semi-finished goods, subassemblies, ideas, information, knowledge) into goods or services.
Research & Development	Basic and applied research in the engineering sciences, as well as design and development of prototype products and processes. Efforts that an organization conducts towards innovating, introducing and/or improving products and processes.
Russian Suspension Agreement	On October 16, 1992, the Department of Commerce suspended the antidumping duty investigations involving uranium imports from Russia on the basis of agreements by the country's government to restrict the volume of direct or indirect exports to the United States in order to prevent the suppression or undercutting of price levels of United States domestic uranium. The agreement expires in 2020.
Sales	All reported and unreported sales of uranium (natural, converted, enriched and/or fabricated), including sales to end-users, producers, conversion facilities, enrichers, financial entities, intermediaries, traders, distributors, et al.
Separative Work Unit (SWU)	The standard measure of enrichment services.
Spot Contract	Contracts with a one-time uranium delivery (usually) for the entire contract, and the delivery typically occurs within one year of contract execution (signed date).

Supplier	An entity from which your organization obtains inputs, which may be goods or services. A supplier may be another organization with which you have a contractual relationship, or it may be another facility owned by the same parent organization.
Term Contract	Long-term contracts are contracts with one or more uranium deliveries to occur after a year following the contract execution (signed date) and as such may reflect some agreements of short and medium terms as well as longer term.
U.S. Department of Energy Uranium Transfer Program	The exchange of natural, enriched, or depleted uranium “tails,” or uranium enrichment services between the U.S. Department of Energy and another party.
United States	The "United States" or "U.S." includes the 50 states, Puerto Rico, the District of Columbia, Guam, the Trust Territories, and the U.S. Virgin Islands.
Uranium Compounds	Includes uranium oxide, uranium hexafluoride, and other uranium compounds.
Uranium Concentrate	The end product of the mining and milling stage, in which uranium oxide concentrate (U3O8) is produced.
Uranium Conversion	The process whereby natural uranium in the form of an oxide is converted to uranium hexafluoride.
Uranium Metal (Natural)	A lustrous silver-white metal that is radioactive, malleable, ductile, and softer than steel. It contains an isotopic ratio of 99.27% U-238, 0.72 % U-235, and 0.0055 % U-234 by weight.
Uranium Metal (Depleted)	A byproduct of enrichment (tailings) or fission, DU has less than one-third of the concentration of U-235 and U-234 by weight. DU from fission (i.e., in reprocessed used nuclear fuel) is distinct because it also contains U-236.
Uranium Mill	A plant where uranium is separated from ore taken from mines, including both conventional mills and in situ recovery (ISR) plants.
Uranium Ore	Ore which contains uranium that has been obtained from conventional or in situ mining methods.
10 CFR § 40.42	Title and section of the U.S. Code of Federal Regulations that cover the Nuclear Regulatory Commission's (NRC) regulation for the expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.
BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act	

1: Organization Information

A. Provide the following information for your organization

Organization Name	
Street Address	
City	
State	
ZIP Code	
Location of Global Headquarters	
U.S. Point of Contact Name	
U.S. Point of Contact Email	
U.S. Point of Contact Phone	

B. Is this organization owned, in whole or in part, by any private or government entity? Indicate Yes/No, then identify the entities below, if applicable. List entities with at least 5% ownership.

Entity Name	Global Headquarters Street Address	Global Headquarters City	Global Headquarters State/Province	Global Headquarters Country	Ownership %

C. At the global headquarters level, identify the total number of nuclear power generation facilities that your organization currently operates inside and outside the U.S.

Activity		Number of U.S. Facilities	Number of Non-U.S. Facilities
Nuclear Power Generation			
Research & Development			
Other	(specify)		

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

2: Mergers, Acquisitions, Divestitures, and Joint Ventures

A

From 2014 - 2018, record the total number of mergers, acquisitions, and divestitures related to *nuclear power generation* in which your organization participated.

	Organization or Partnership Entity Name	Type of Activity	% of Shares Held by Partner Organization	Country Headquarters	Year Initiated	Primary Work Scope	Primary Purpose of Relationship	Explain
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

B

From 2014 - 2018, record the total number of joint ventures and other business partnerships related to *nuclear power generation and nuclear power generation R&D* , including public/private partnerships, in which your organization participated.

	Organization or Partnership Entity Name	Type of Partnership	% of Shares Held by Partner Organization	Country Headquarters	Year Initiated	Primary Work Scope	Primary Purpose of Relationship	Explain
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

C

From 2014 - 2018, record the total number of joint ventures and other business partnerships related to u*anium production (front end nuclear fuel cycle)* , including public/private partnerships, in which your organization participated.

	Organization or Partnership Entity Name	Type of Partnership	% of Shares Held by Partner Organization	Country Headquarters	Year Initiated	Primary Work Scope	Primary Purpose of Relationship	Explain
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

Next Page

3a: Facility Information

U.S. Facilities

Identify the total number of facilities that your organization owns in the United States involved in the generation of nuclear power.

List your organization's nuclear power generation facilities located in the United States, identifying each facility's name, city, state, operating status, reactor information, and any expected change in operations (e.g. expansion, worker layoffs, shutdown, etc.) from 2019-2023. If the facility operated in 2018, report the 2018 production volume in megawatthours (MWh). Even if a facility is closed, fill out all information possible.

	U.S. Facility Name	City	State	Operating Status	Merchant vs. Regulated	Amount of Reactors	2018 Total Production Volume (MWh)	Amount of U3O8 needed to run facility per year (Pounds)	Reactor Unit No.	Status of Reactor	Reactor Type	Reactor Vendor	Number of Current Active Fuel Assembly Suppliers	Number of Fuel Assemblies Required to Operate Per Year	Licensed MWe	Expected Change 2019-2023	Explanation of Change, If Applicable
1																Closure	
																Significant Modernization	
																Expansion	
																None	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	

If any of your U.S. facilities are scheduled to close or may close in the 2019-2023 period, explain the circumstances of this action.

Non-U.S. Facilities

Identify the total number of facilities that your organization owns outside the United States involved in the generation of nuclear power.

List your organization's nuclear power generation facilities located outside the United States, identifying each facility's name, city, state, operating status, reactor information, and any expected change in operations (e.g. expansion, worker layoffs, shutdown, etc.) from 2019-2023. If the facility was operating, report the 2018 production volume in megawatthours (MWh). Even if a facility is closed, fill out all information possible.

	Non-U.S. Facility Name	City	Country	Operating Status	Merchant vs. Regulated	Amount of Reactors	2018 Total Production Volume (MWh)	Amount of U3O8 needed to run facility per year (Pounds)	Reactor Unit No.	Status of Reactor	Reactor Type	Reactor Vendor	Number of Current Active Fuel Assembly Suppliers	Number of Fuel Assemblies Required to Operate	Licensed MWe	Expected Change 2019-2023	Explanation of Change, If Applicable
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	

If any of your non-U.S. facilities are scheduled to close or may close in the 2019-2023 period, explain the circumstances of this action.

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

Next Page

3b: Facility Inventory

Provide all U.S. and non-U.S. inventories held directly or indirectly by you for the 2014 to 2018 period, current as of 12/31/2018.

U.S. Facilities

For any facility in the U.S., whether that facility is owned by you or another organization, indicate which forms of uranium your organization keeps in inventory, and the amounts of each in inventory for the 2014 to 2018 period, utilizing the measurements provided in parentheses.

	U.S. Facility Name	Facility Owner	Operating Status	Types of Uranium in Inventory	Yes/No	2014	2015	2016	2017	2018
1				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
2				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
3				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
4				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
5				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
6				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
7				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
8				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
9				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
10				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						

				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
11				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
12				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
13				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
14				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
15				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						

Non-U.S. Facilities

For each non-U.S. location, whether that facility is owned by you or another organization, indicate which forms of uranium your organization keeps in inventory, and the amounts of each in inventory for the 2014 to 2018 period, utilizing the measurements provided in parentheses.

	Non-U.S. Facility Location	Operating Status		Types of Uranium in Inventory		2014	2015	2016	2017	2018
				Uranium Ore and Concentrates (Pounds U3O8)	Yes/No					
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
1				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
2				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
3				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
4				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
5				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
6				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						

				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
7				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
8				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
9				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
10				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
11				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
12				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
13				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
14				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						
				Uranium Ore and Concentrates (Pounds U3O8)						
				Uranium Compounds (Oxide, Hexafluoride, Other) (KgU)						
15				Enriched Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Depleted Uranium (Oxide, Hexafluoride, Other) (KgU)						
				Fuel Assemblies (Finished Units)						

Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

Next Page

3c: Facility Refueling Cycle

Provide information pertaining to the reloading/refueling cycle for each of your organization's facilities, current as of 12/31/2018. If your organization operates two different reactor types at the same facility, separately report refueling information for each reactor type.

		U.S. Facility Name	Fresh Fuel Batch Size (Number of Assemblies)	Uranium Contained in Fresh Fuel Batch (Pounds U3O8 Equivalent)	Percentage of Total Reactor Assemblies Replaced During Refuel	Refueling Cycle Length (Months)	Refueling Outage Length (Days)	Fuel Cycle Costs as Percentage of Total Facility Operating Costs				
								U3O8 Acquisition (Mining, Milling)	Conversion Services/UF6 Acquistion	Enrichment Services/EUP Acquistion	Fuel Fabrication Services	Aggregate Fuel Cycle Expenses as Percentage of Total Facility Operating Costs
A.	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
	13											
	14											
	15											

Since 2014, has your organization considered or implemented changes in a facility's refueling cycle (e.g. lengthening the refueling cycle)?	Yes	If yes, describe.
Describe your organization's typical sequence for procuring nuclear fuel.		
Comments:		

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

3d: Changes in Facility Operations, 1999-2018

Identify any U.S. nuclear power generation facility closings, relocations, contractions, expansions, corporate acquisitions or consolidations, or other major changes in operations (report as many as applicable). For each change, provide the reasons for the change in operations (e.g.,loss of market share to imports, loss/gain of market share from domestic competition, increasing/declining demand, low/high profitability, firm restructuring), and megawatthours of nuclear power impacted, as well as number of full-time-equivalent (FTE) employees impacted. Denote reductions with a "-" symbol. If a single facility has gone through multiple changes, list the facility on multiple lines and identify each separately.

A.

	Facility Name	Type of Change	Date of Change	Reason for Change	Annual MWh Capacity	Annual MWh Impacted	Number of FTEs Impacted	Explanation
1		Closure						
2		Standby/Idle						
3		Contraction						
4		Expansion						
5		Significant Modernization						
6		Transfer/Sale						
7		Other						
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								`
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Answer the following questions about facility changes in Section B and C.

If one of your organization's facilities was in the decommissioning process and had discharged its operator license, how long would it take, if possible, to fully restart operations at that facility? For each facility that your organization operates, indicate the factors that might inhibit restarting operations and the degree of impact for each factor. Estimate the total costs associated with each factor, and then explain your reasoning for your choices.

	Facility Name	Estimated Time to Restart (in days)	Estimated Cost to Restart (in $1000s USD)	Factors Inhibiting Restart		Estimated Cost of Each Factor (in $1000s USD)	Explain
				Factor	Degree of Impact		
				Operations	High		
1				Regulatory (non-Environmental)	Moderate		
				Environmental	Low		
				Employment	None		
				Other (specify)			
				Operations			
2				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			`
				Operations			
3				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			`
				Operations			
4				Regulatory (non-Environmental)			
				Environmental			
				Employment			

					Other (specify)			`
B.	5				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	6				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	7				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	8				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	9				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	10				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	11				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	12				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	13				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	14				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`
	15				Operations			
					Regulatory (non-Environmental)			
					Environmental			
					Employment			
					Other (specify)			`

C.

If one of your organization's facilities was in standby but had not discharged its operator license, how long would it take, if possible, to fully restart operations at that facility? Assume the facility is not in standby for scheduled maintenance for refueling purposes. For each type of facility that your organization operates, indicate the factors that might inhibit the process in the space provided, ranking them from 1 to 5, with 1 being the most challenging factor, then explain the reasoning behind your choice.

	Facility Name	Estimated Time to Restart	Estimated Cost to Restart	Factors Inhibiting Restart		Estimated Cost of Each Factor (Thousands USD)	Explain
				Factor	Degree of Impact		
1				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
2				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
3				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
4				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
5				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
6				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
7				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
8				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
9				Operations			
				Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			

				Operations			
	10			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
				Operations			
	11			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
				Operations			
	12			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
				Operations			
	13			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
				Operations			
	14			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			
				Operations			
	15			Cost of Standby			
				Regulatory (non-Environmental)			
				Environmental			
				Employment			
				Other (specify)			

D.	Describe the costs associated with maintaining a facility in standby, and estimate the total costs involved in maintaining a standby facility.			
	Would your organization opt to maintain a facility in standby?	Yes	If yes, explain.	
	Describe the costs and regulatory factors associated with maintaining a "brownfield" site.			
	Describe the costs and regulatory factors associated with maintaining a "greenfield" site.			

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

4: Production Capacity

Provide the facility-level information regarding production capacity and CO2 offset below.

		Facility Name	Facility Location	Reactor Type	Average Annual Production 2014-2018 (MWh)	Average Annual Production Capacity 2014-2018 (MWh)	Average Capacity Utilization 2014-2018 (%)	Explanation for Difference Between Production Capacity and Annual Production, If Applicable	Fuel Cycle Cost as % of MWh Cost				Annual Estimated Facility CO2 Offset (Tons)
									Uranium Concentrate (U3O8)	UF6 Conversion	Enrichment	Fuel Fabrication	
A.	1			PWR and BWR									
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
	10												
	11												
	12												
	13												
	14												
	15												

B.	1	Are your facilities capable of load following (e.g. ramping up and down electric output depending on demand)? Explain.	Yes	If yes, explain.	
	2	What changes to supply factors would contribute the most to change in MWh cost? Explain.			
Comments:					

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5: Permits

A. Provide the permit information for your facilities below for both the state and federal level. Include permits for environmental and safety aspects.

	Facility Name	Permit Type	Issuing Agency	Cost of Permit	Average Length of Processing Time	Original Permit Date	Original Permit Expiration Date	Number of Renewal Applications	Average Renewal Application Length	Expiration Date of Current Permit	Plans to Renew Current Permit	Explanation
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

B.

1	Has your organization had difficulty obtaining permits for operation? If yes, explain below.	
2	Have your permitting costs increased in the last ten years? If yes, explain below.	
3	If you indicated that your organization does not plan to renew a permit, describe the factors that have influenced those decisions below.	
4	Does your organization have any suggestions that would help improve the permitting process?	

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

6: Financials

Provide the following financial line items for your organization's nuclear power generation-related U.S. operations below for the 2014 to 2018 period.

		Income Statement (Select Line Items)	Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
			2014	2015	2016	2017	2018
1	A.	Net Sales (and other revenue)					
	B.	Cost of Goods Sold					
	C.	Total Operating Income (Loss)					
	D.	Earnings Before Interest and Taxes					
	E.	Net Income					

		Balance Sheet (Select Line Items)	Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
			2014	2015	2016	2017	2018
2	A.	Cash					
	B.	Inventories					
	C.	Total Current Assets					
	D.	Total Assets					
	E.	Total Current Liabilities					
	F.	Total Liabilities					
	G.	Retained Earnings					
	H.	Total Owner's Equity					

Note: Total Assets must equal Total Liabilities plus Total Owner's Equity

		2014	2015	2016	2017	2018
3	Total Revenue per MWh					
	Total Operating Costs per MWh					

		2014	2015	2016	2017	2018
4	Federal Taxes Paid					
	State Taxes Paid					
	Local Taxes Paid					

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page Next Page

7: Capital Expenditures

Record your organization's nuclear power generation-related capital expenditures corresponding to the select categories below for the 2014 to 2018 period.

	Capital Expenditure Activity Type	Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
A	Total Capital Expenditures					
1	Machinery, Equipment, and Vehicles [as a % of A]					
2	IT, Computers, Software [as a % of A]					
3	Land, Buildings, and Leasehold Improvements [as a % of A]					
4	Fuel [as a % of A]					
5	Other (Specify) [as a % of A]					
6	Other (Specify) [as a % of A]					
Lines 1 through 5 must total 100%						

B

For the below categories, indicate whether your organization experienced significant changes (increases, decreases, or both), in uranium and/or nuclear fuel capital expenditures over the past ten years (2009-2018). Explain what factors have been affecting changes in your organization's capital expenditures from 2009 to 2018, including, but not limited to, U.S. Government or state government policies or regulations, domestic and foreign competition, and declining uranium prices.

		Yes/No	If Yes, Type of Change	Explain
1	Machinery, Equipment, and Vehicles			
2	IT, Computers, Software			
3	Land, Buildings, and Leasehold Improvements			
4	Fuel			
5	Other (Specify)			
6	Other (Specify)			

Comments:

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

8: Research & Development

A.	Has your organization conducted nuclear power generation-related research and development (R&D) in the past ten years?	If no, proceed to Section 9.

Record your organization's total R&D dollar expenditures and type of R&D expenditure for the 2014 to 2018 period.

B.

		Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
1	Total R&D Expenditures					
2	Basic Research [as a % of B1]					
3	Applied Research [as a % of B1]					
4	Product/Process Development [as a % of B1]					
5	Total of 2 - 4 [must equal 100%]	0%	0%	0%	0%	0%

Identify your organization's R&D funding sources, by percent total of R&D dollars sourced.

C.

		Record $ in Thousands, e.g. $12,000.00 = survey input of $12				
		2014	2015	2016	2017	2018
1	Total R&D Funding Sources					
2	Internal/Self-Funded/IRAD [as a % of C1]					
3	Total Federal Government [as a % of C1]					
4	Total State and Local Government [as a % of C1]					
5	Universities - Public and Private [as a % of C1]					
6	U.S. Industry, Venture Capital, Non-Profit [as a % of C1]					
7	Non-U.S. Investors [as a % of C1]					
8	Other (specify)					
9	Total of 2 - 8 [must equal 100%]	0%	0%	0%	0%	0%

D.	1	For 2014 to 2018, did your organization experience constraints (for example, inadequate revenue) on U.S. R&D activities?		If yes, explain and identify additional R&D activities that would occur absent those constraints.

E	Is your organization currently working with any foreign partners with respect to R&D activities?					If yes, answer the following questions.	
		Partner Company	Company Headquarters	Partnership Start Date	Goal of Partnership	Reason for choosing Partner	Percent of R&D Expenditures
	1						
	2						
	3						
	4						
	5						

Comments:	

BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act

Previous Page

9. Deliveries, 2014-2018

Identify all purchases of uranium products or contracts for fuel cycle services made by your organization with delivery dates between 2014-2018. Additionally, identify all contract fulfillments for fuel cycle services anticipated for the 2014-2018 period. For the Deliveries as Percentages of Fuel Capital Budget columns- if a given contract did not cover one of the years in the 2014-2018 period, enter NA in the applicable column(s). (e.g. If a contract only had deliveries for 2014 through 2016, but none in 2017 or 2018, enter NA in the 2017 and 2018 columns. "Open Origin" contracts are defined as contracts which permit uranium supplied under the contract to be sourced from any country.

Uranium Ore (Pounds)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
4								Other (Explain in Comments)																	
A 5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
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16																									
17																									
18																									
19																									
20																									

Comments

Uranium Concentrate (Pounds U3O8)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
4								Other (Explain in Comments)																	
B 5																									
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18																									
19																									
20																									

Comments

Uranium Metal (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
4								Other (Explain in Comments)																	
5																									
C 6																									
7																									
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18																									
19																									
20																									

Comments

Natural Uranium – Not Compounds (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
4								Other (Explain in Comments)																	
5																									
G 6																									
7																									
8																									
9																									
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14																									
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16																									
17																									
18																									
19																									
20																									

Comments

Uranium Compounds - Oxide (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
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Uranium Compounds - Hexafluoride (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Uranium Compounds - Other (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Depleted Uranium- Oxides (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Depleted Uranium- Flourides (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Depleted Uranium- Other (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Depleted Uranium- Metal (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
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Enriched Uranium Oxide (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enriched Uranium Hexafluoride (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enriched Uranium - Other (Pounds U3O8 Equivalent)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
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Conversion Services

If your organization did not receive any fulfillments from contracts for conversion services in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enrichment Services

If your organization did not receive any fulfillments from contracts for enrichment services in the 2014-2018 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds U3O8 Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
3							Other	Fixed Plus Market																	
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Finished Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

If your organization did not receive any deliveries of this product in the 2014-2018 period, please choose "Not Applicable" in the space provided.

Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of USOB Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Percentages of Fuel Capital Budget									
																Percentage of 2014 Fuel Capital Budget (Pounds USOB Equivalent)	Percentage of 2014 Fuel Capital Budget (Thousands USD)	Percentage of 2015 Fuel Capital Budget (Pounds USOB Equivalent)	Percentage of 2015 Fuel Capital Budget (Thousands USD)	Percentage of 2016 Fuel Capital Budget (Pounds USOB Equivalent)	Percentage of 2016 Fuel Capital Budget (Thousands USD)	Percentage of 2017 Fuel Capital Budget (Pounds USOB Equivalent)	Percentage of 2017 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2018 Fuel Capital Budget (Pounds USOB Equivalent)	Estimated Percentage of 2018 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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10. Future Deliveries, 2019-2023

Identify all purchases of uranium products or contracts for fuel cycle services made by your organization with delivery dates between 2019 and 2023. Additionally, identify all contract fulfillments for fuel cycle services anticipated for the 2019-2023 period. For the Deliveries as Estimated Percentages of Fuel Capital Budget columns- if a given contract did not cover one of the years in the 2019-2023 period, eneter NA in the applicable column(s). (e.g. if a contract only had deliveries for 2019 through 2021, but none in 2022 and 2023, eneter NA in the 2022 and 2023 columns.) "Open Origin" contracts are defined as contracts which permit uranium supplied under the contract to be sourced from any country.

Uranium Ore (Pounds)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Comments

Uranium Concentrate (Pounds U3O8)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Comments

Uranium Metal (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Natural Uranium - Not Compounds (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Uranium Compounds - Oxide (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Uranium Compounds - Hexafluoride (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
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Uranium Compounds - Other (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
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Depleted Uranium- Oxides (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
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1					Short-Term		Price	Fixed	Yes		Yes														
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Depleted Uranium- Flourides (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
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Depleted Uranium- Other (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Comments

Depleted Uranium- Metal (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enriched Uranium Oxide (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enriched Uranium Hexafluoride (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
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1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Enriched Uranium - Other (Pounds U3O8 Equivalent)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
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1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Conversion Services

If your organization does not anticipate receiving any fulfillments from contracts for conversion services in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
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2					Long-Term		Shutdown	Market	No		No														
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Enrichment Services

If your organization does not anticipate receiving any fulfillments from contracts for enrichment services in the 2019-2023 period, please choose "Not Applicable" in the space provided. Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
1					Short-Term		Price	Fixed	Yes		Yes														
2					Long-Term		Shutdown	Market	No		No														
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Finished Fuel Assemblies (PWR, BWR, or Other) (Finished Units)

If your organization does not anticipate any deliveries of this product in the 2019-2023 period, please choose "Not Applicable" in the space provided.

Not Applicable

	Seller Name	Country of Seller Headquarters	Delivery Date	Date of Contract Signature	Type of Contract	Date of Contract Renegotiation (If Applicable)	Reason for Contract Renegotiation (If Applicable)	Pricing Mechanism	Contract Completed?	Years Remaining on Contract (If Applicable)	Open Origin	Country of U3O8 Origin	Price Per Unit (USD)	Quantity Delivered	Value of Quantity Delivered (thousands USD)	Deliveries as Estimated Percentages of Fuel Capital Budget									
																Estimated Percentage of 2019 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2019 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2020 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2020 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2021 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2021 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2022 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2022 Fuel Capital Budget (Thousands USD)	Estimated Percentage of 2023 Fuel Capital Budget (Pounds U3O8 Equivalent)	Estimated Percentage of 2023 Fuel Capital Budget (Thousands USD)
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2					Long-Term		Shutdown	Market	No		No														
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11: Projected Shipments to Enrichment Services Providers and Unfilled Uranium Requirements, 2019-2028

Answer the following questions about projected shipments to enrichment services providers and unfilled uranium requirements.

	Projected Shipments to Enrichment Services Providers (Pounds U308 Equivalent)									
A	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028

	Unfilled Uranium Requirements (Pounds U308 Equivalent)									
B	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028

C	Has your organization changed its timeframe for filling uranium requirements? (e.g., if your organization previously filled requirements five years in advance but now only fills three years in advance) Explain.	Yes

Comments:	

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12: Logistics

Answer the following questions about transportation of your imported uranium products. For this question, initial port of export is defined as the first port through which a uranium product leaves a foreign country after your organization has acquired title to the product.

E	Uranium Products		
	Top Ten Initial Ports of Export (Ranked by Volume of Pounds U3O8 equivalent)	Carriers Serving Port	Percentage of Total Imports of Uranium Products
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

If any of the ports listed above were to be closed, what ports would your organization use to export uranium?	
Describe any difficulties your organization has encountered in complying with the Foreign Corrupt Practices Act as pertains to the transportation and export of uranium products.	
Comments:	

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13: Employment

Record the total number of full time equivalent (FTE) employees and contractors for 2009, and again for the 2014 to 2018 period.

		2009	2014	2015	2016	2017	2018
A	FTE Employees						
	FTE Contractors						

Answer the following questions about employment difficulties, workforce age, educational requirements, vacancies, and changes in employment.

	Occupation		Difficulty	Explanation for Difficulty, if Applicable	FTEs Impacted (2014-2018)		Current Average Age of Worker (2019)	Educational Requirements (Formal and On-The-Job)	On-The-Job Training Requirements (OJT)	Current Number of Vacancies (2019)	Average Weeks Vacant	Explanation
					If FTEs were impacted due to changes in facility operations, indicate which types of employees were impacted	Type of Employment Impact						
B	Engineering (Civil, Electrical, Mechanical, Chemical, Other)		Hiring					No Formal Educational Credential	No OJT Required			
	Engineering (Nuclear)		Retaining					High School Diploma or Equivalent	Less Than A Month Of OJT Required			
	Nuclear-Related Administrative Professions (Nuclear Planning, Nuclear Oversight)		Both					Associate's Degree	Between 1 Month And 6 Months Of OJT Required			
	Non-Nuclear Administrative Professions (Accountants, Financial, Lawyers)		None					Bachelor's Degree	Between 6 Months To 1 Year Of OJT Required			
	Nuclear Technicians & Radiation Workers (Radiation Protection Specialists, Reactor Operators, Control Room Personnel)							Master's Degree	Between 1 And 2 Years Of OJT Required			
	Non-Nuclear Technicans (Heavy Equipment Operators, Mechanics, Electricians)							Doctoral or Professional Degree	Over 2 Years Of OJT Required			
	Security Personnel (Guards, Emergency Management)											
	Skilled Trades (Carpenters, Masons, Pipefitters, Sheet metal workers, Welders)											
	Other	(specify here)										

C. Does the industry experience any amount of workforce cross-over between commercial and government nuclear power generation activities? Explain.

Yes

D. Are the skills associated with the workforce in your organization transferable to other industries? Explain.

Yes

E. Does the geographic location of your organization's facilities play any role in the challenges in hiring, retaining, and rehiring employees? Explain.

Yes

F. If one of your facilities were idled, how long do you reasonably anticipate being able to rehire workers laid off due to the idling?

G. If your organization utilizes or provides consulting services that assist in optimizing core business processes relating to your organization's role in the nuclear fuel cycle, describe the types of firms you work with, and the substance of the consulting work.

Comments:

14a: Market Trends

A

From your organization's perspective, explain political support and public perception within United States and outside of the United States of nuclear power has changed from 2009 to 2018. Explain any trends and describe the principal factors that have affected these changes in perception.

Market	Overall Change	Explanation and Factors
Within the United States		
Outside the United States		

B.

From 2009 to 2018, indicate whether uranium import competition has affected your U.S. operations, sales, employment, planned expansions, investments, etc. with respect to the production nuclear power. Explain your answers.

	Item	Yes/No	Explain
1	Manufacturing Operations	Yes	
2	Sales	Yes	
3	Employment	Yes	
4	Planned Expansions	Yes	
5	Other (specify)	Yes	

From 2009 to 2018, has your organization experienced any negative effects on its return on investment or its growth, investment, ability to raise capital, existing development and production efforts, or the scale of capital investments as a result of imports of any type of uranium or nuclear fuel assemblies into the United States? Indicate Yes/No to the right and explain below.

Yes

1	Return on Investment	Yes	
2	Investments	Yes	
3	Ability to Raise Capital	Yes	
4	Existing Development/ Production Efforts	Yes	
5	Scale of Capital Investments	Yes	
6	Other (specify)	Yes	

	Does your organization anticipate any negative effects on its business due to future imports of any type of uranium or nuclear fuel assemblies into the United States, particularly from countries with state-owned enterprises such as Russia, Kazakhstan, Uzbekistan, and China? Indicate Yes/No to the right and explain below.		Yes	
	1	Russia	Yes	
	2	Kazakhstan	Yes	
	3	Uzbekistan	Yes	
	4	China	Yes	
	5	Other (Specify)	Yes	

C	Describe the top 5 most significant challenges to the competitive position of your organization's U.S. nuclear operations in the U.S. energy market.	
	1	
	2	
	3	
	4	
	5	
	Describe the top 5 most significant challenges to the competitive position of your organization's non-U.S. nuclear operations in the non-U.S. energy market.	
	1	
	2	
	3	
	4	
	5	

D	Are there proposed regulatory or legislative initiatives at the federal or state level that would improve the financial viability of your organization's nuclear power generation facilities? Explain below.	Yes

Comments:	

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Previous Page Next Page

14b: Competitive Hardships

Please answer the following questions, then provide explanations for your answers.

		Prices and Practices	-Yes/No-	Explain
A	1	Has your organization engaged in any cost-cutting measures in order to compete in the current energy market? Explain.	Yes	
	2	Has your organization made significant operational or strategic changes in order to better compete in the energy market? Explain.	Yes	
	3	Does your organization incorporate national security considerations in its assessment of reliability and risk as pertains to selection of uranium suppliers?	Yes	

		Operational Practices	-Yes/No-	Explain
B	1	Do your organization's nuclear power facilities provide baseload generation capacity?	Yes	
	2	Have any of your facilities had to reduce electrical output due to market or other conditions? If yes, what factors contributed to this?	Yes	
	3	Is your organization considering a change in any of your facilities' operating flexibility to respond to market conditions? Describe.	Yes	
	4	In the event of a disruption in fuel delivery to any of your facilities, would your organization need to decrease output at that facility? If yes, how long could that facility operate at full capacity without refueling?	Yes	

		Regulatory Factors and Competition	-Yes/No-	Explain
C	1	Has your organization experienced difficulties selling energy due to competition from solar and wind producers, particularly those who sell energy at zero or negative cost?	Yes	
	2	Have state Renewable Portfolio Standards had an impact on your facilities' viability?	Yes	
	3	Have federal or state regulatory frameworks affected your organization's ability to economically operate your power generation facilities?	Yes	
	4	Does your organization perceive that current energy pricing does not reflect the value of nuclear energy?	Yes	
	5	Has low cost natural gas affected your organization's competitiveness? Explain.	Yes	
	6	Does your organization receive any state or federal subsidies for facilities involved in the generation of nuclear power? Explain.	Yes	
	7	Has the U.S. Department of Energy's program of selling off natural uranium and LEU stocks affected your organization? Explain.	Yes	
	8	Excluding license extensions, has your organization performed mandated regulatory upgrades since 1999? If so, does your organization believe that these upgrades were warranted?	Yes	
	9	Does your organization believe that regulatory costs are more burdensome than fuel costs?	Yes	

		International Operations and Factors	-Yes/No-	Explain
D	1	Excluding direct government subsidies, do you believe that foreign uranium producers operate at lower costs than U.S. producers? Explain.	Yes	
	2	Does your organization consider environmental, health, safety, and labor standards in foreign countries when considering business with foreign suppliers?	Yes	
	3	Does your organization purchase uranium products from Russia, China, Kazakhstan, and Uzbekistan? If so, describe what factors your organization considers in its risk analysis reports for these countries.	Yes	
	4	Will China's increasing presence in the nuclear fuel sector affect your organization? Explain.	Yes	
	5	Has the 2011 Fukushima disaster impacted your organization's nuclear power operations? Explain.	Yes	
	6	Have foreign suppliers offered to offset any potential costs imposed by a potential remedy under Section 232? If so, explain.	Yes	
	7	Do nuclear power generators face challenges in complying with the Foreign Corrupt Practices Act (FCPA) when purchasing imported uranium products from foreign countries? Identify any specific countries where these practices, as defined in the FCPA, are prevalent.	Yes	
	8	Do uranium producers operating in foreign market economies (e.g. Canada, Australia) have competitive advantages (e.g. geology, business practices, logistics chain) over U.S. producers?		
	9	Do regulatory or legislative frameworks give operators in foreign market economies (e.g. Canada, Australia) advantages over U.S. producers?		
	10	Has your organization dealt with any supply disruptions from foreign sources in the past five years? Explain.	Yes	
		Russian Presence on the Global Uranium Market	-Yes/No-	Explain
E	1	How have restrictions on imports of Russian uranium affected your organization?	Yes	
	2	How would your organization's posture be affected by an increased Russian presence in the U.S. market?	Yes	
	3	Would your organization plan to purchase more Russian-origin uranium if the suspension agreement ends in 2020?	Yes	

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Previous Page

15: Certification

The undersigned certifies that the information herein supplied in response to this questionnaire is complete and correct to the best of his/her knowledge. It is a criminal offense to willfully make a false statement or representation to any department or agency of the United States Government as to any matter within its jurisdiction (18 U.S.C. 1001 (1984 & SUPP. 1197)).

Once your organization has completed this survey, save a copy and submit it via email to Uranium232@bis.doc.gov. Be sure to retain your survey for your records and to facilitate any necessary edits or clarifications.

BIS Survey Website https://www.bis.doc.gov/nuclearoperator

Organization Name	
Organization's Internet Address	
Name of Authorizing Official	
Title of Authorizing Official	
E-mail Address	
Phone Number and Extension	
Date Certified	

In the box below, provide any additional comments or any other information you wish to include regarding this survey assessment.

How many hours did it take to complete this survey?	

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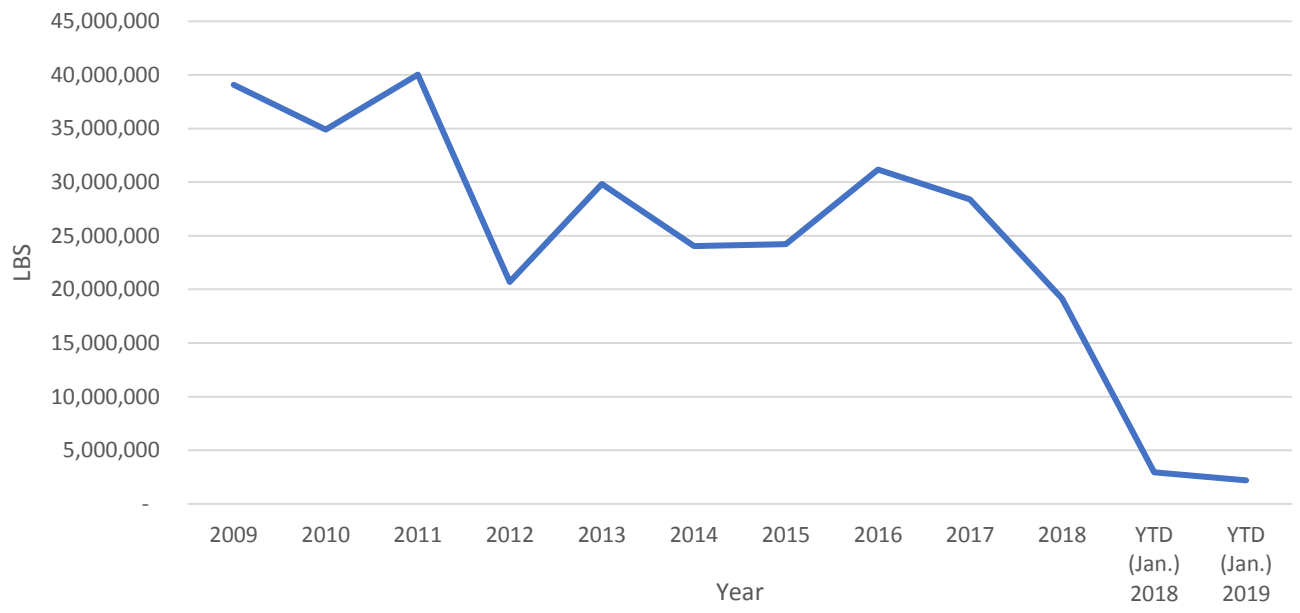
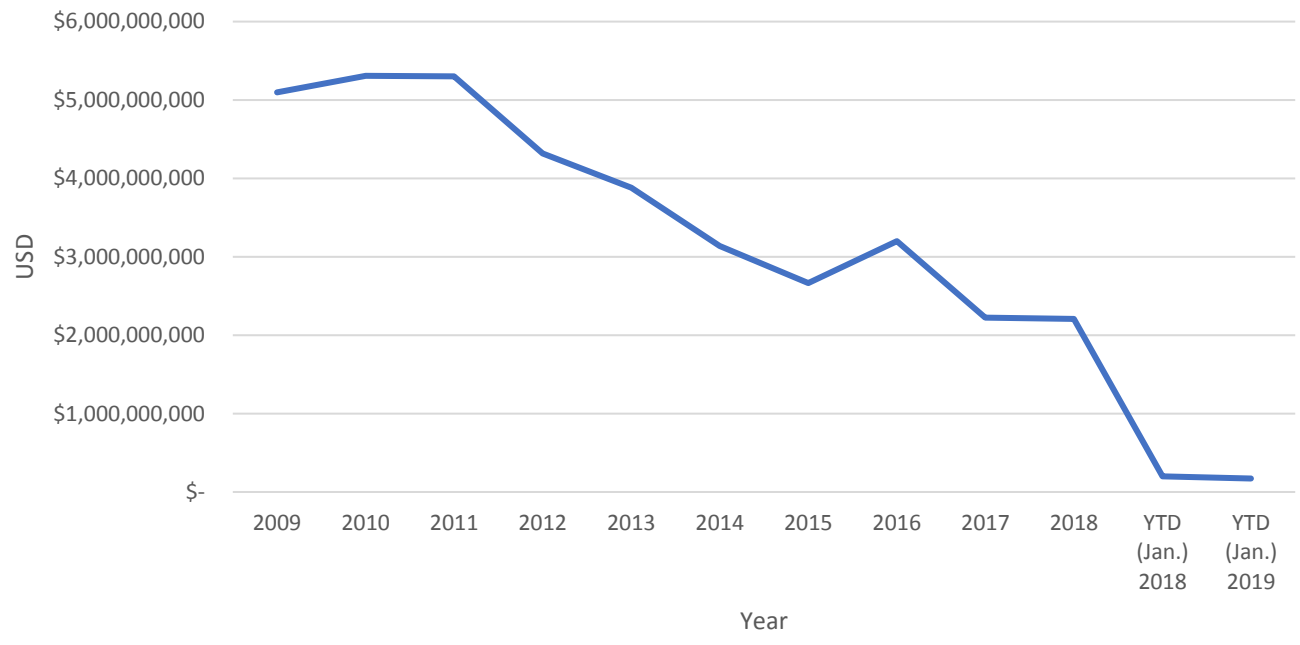
Appendix F

U.S. Imports of All Uranium Products (Pounds)
2009 – YTD January 2019



Source: USITC Data Web, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20, 2844.30.50.

U.S. Imports of All Uranium Products (USD)
2009 – YTD January 2019



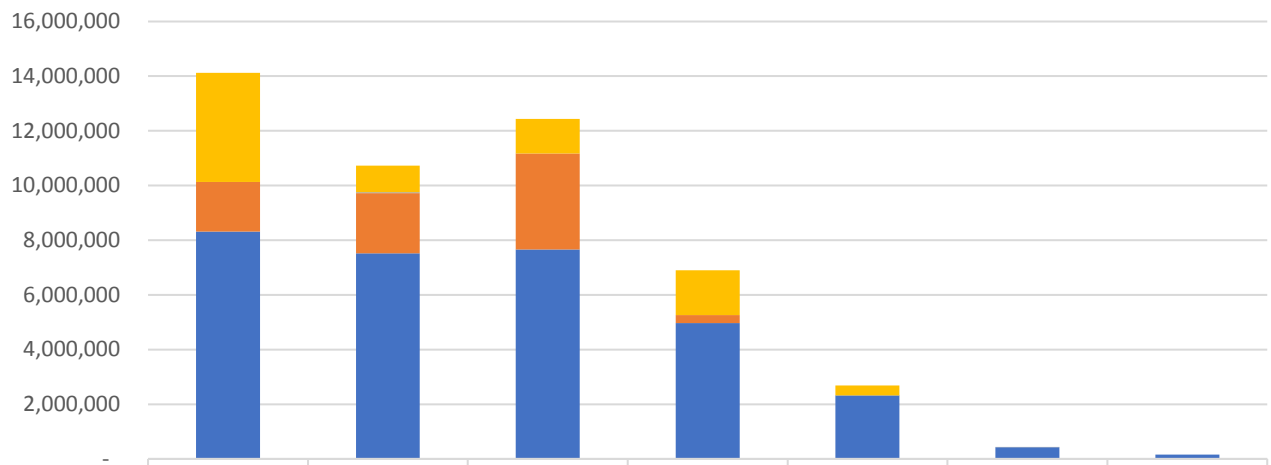
Source: USITC Data Web, HTS Codes: 2612.10.00, 2844.10.20, 2844.20.00, 2844.10.10, 2844.10.50, 2844.30.20, 2844.30.50.

U.S. Imports of Uranium Ore and Concentrate from the World (Pounds)
2009 – YTD January 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (LBS)	21,506,568	15,351,361	12,303,551	9,627,516	11,372,914	14,117,012	10,726,071	12,442,482	6,896,754	2,687,821	426,621	154,588

Source: USITC Data Web, HTS Code: 2612.10.00

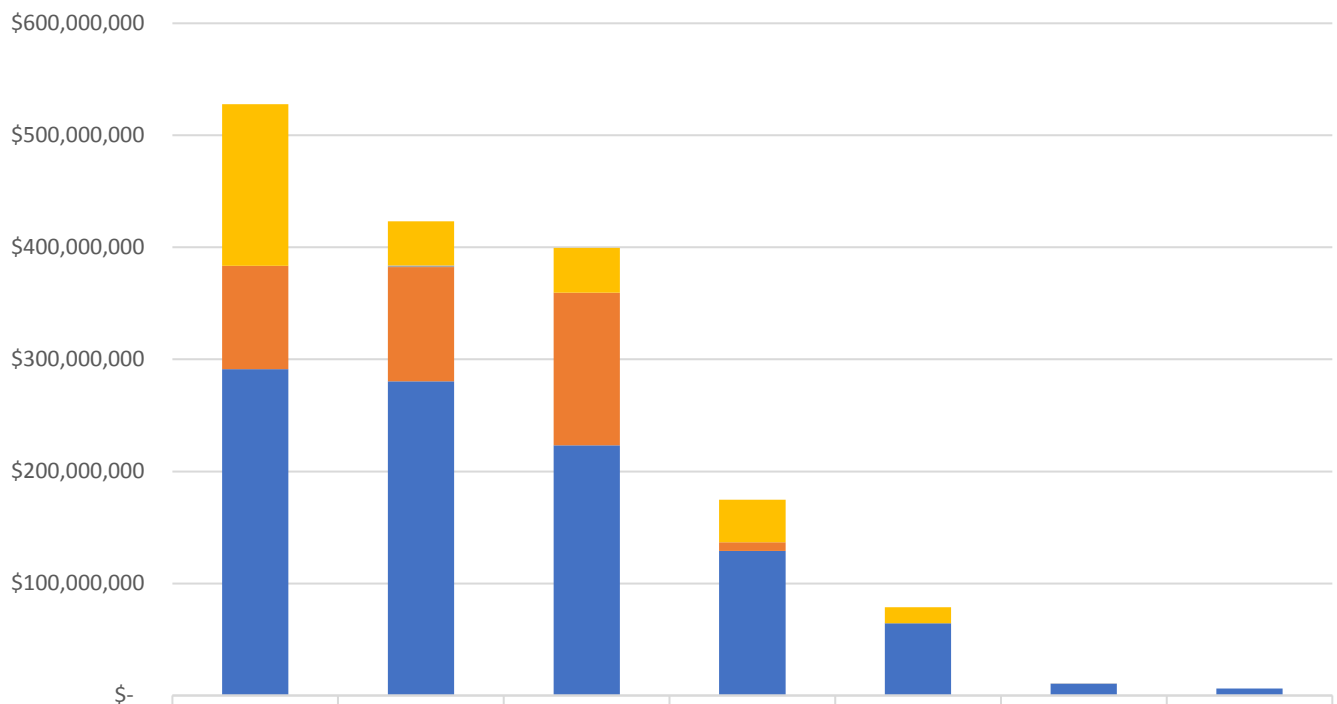
U.S. Imports of Uranium Ore and Concentrates (Pounds)
2009 – YTD January 2019



	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Namibia	3,986,035	970,316	1,270,423	1,629,564	366,095	-	-
Canada	0	40,305	0	0	9	9	
Kazakhstan	1,809,142	2,195,798	3,512,253	300,785	-	-	-
Australia	8,321,835	7,519,653	7,659,807	4,966,404	2,321,717	426,612	154,588

Source: USITC Data Web, HTS Code: 2612.10.00

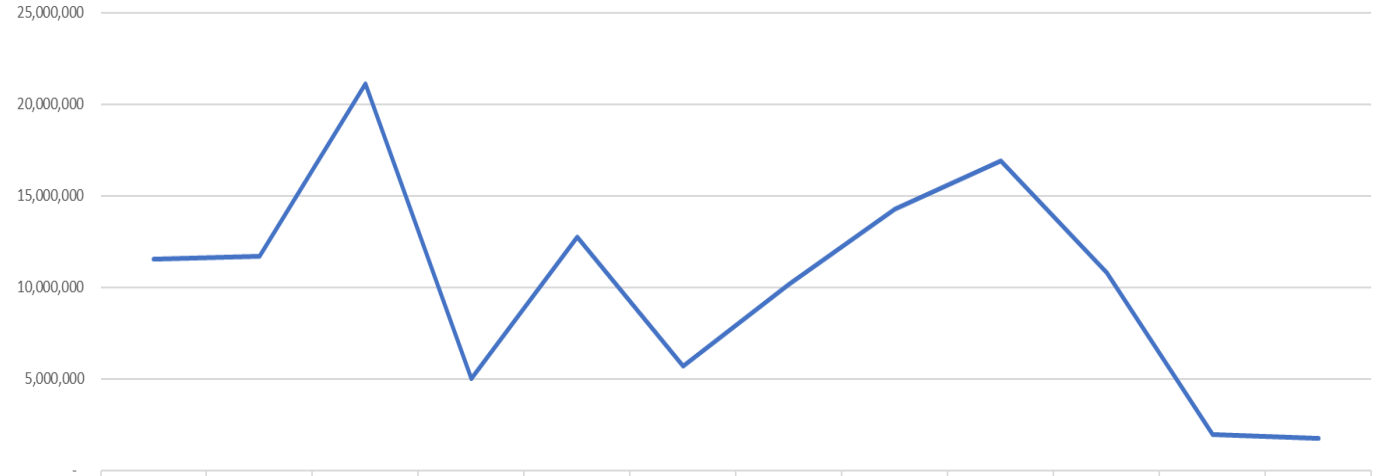
U.S. Imports of Uranium Ore and Concentrates (USD)
2009 – YTD January 2019



	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Namibia	$144,068,510	$39,394,827	$40,180,204	$38,201,947	$14,267,994	$-	$-
Canada	$-	$1,644,555	$-	$-	$2,159	$2,159	$-
Kazakhstan	$92,171,941	$101,753,633	$136,276,942	$7,647,039		$-	$-
Australia	$291,413,877	$280,535,731	$223,212,309	$129,025,610	$64,470,610	$10,633,210	$6,116,558

Source: USITC Data Web, HTS Code: 2612.10.00

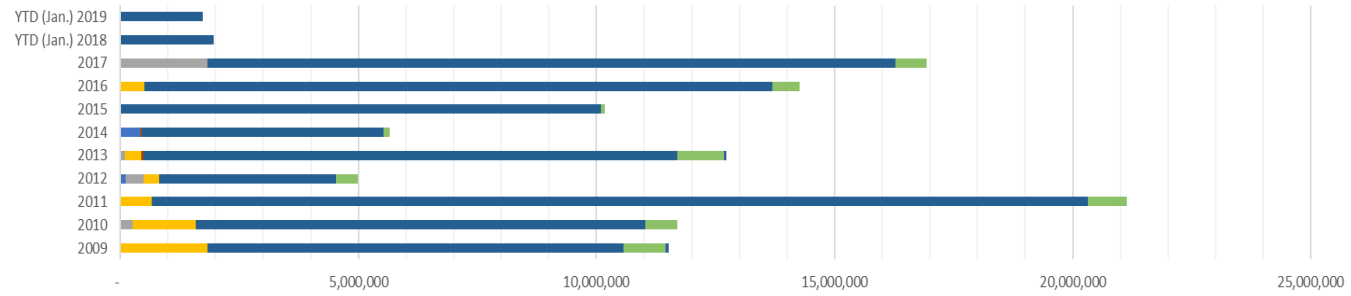
U.S. Imports of Uranium Compounds (Oxide, Hexafluoride, and Other) from the World (Pounds) 2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (LBS)	11,520,421	11,702,787	21,138,614	4,993,234	12,734,379	5,666,669	10,178,754	14,265,943	16,923,391	10,798,858.90	1,962,604	1,739,106

Source: USITC Data Web, HTS Code: 2612.10.20

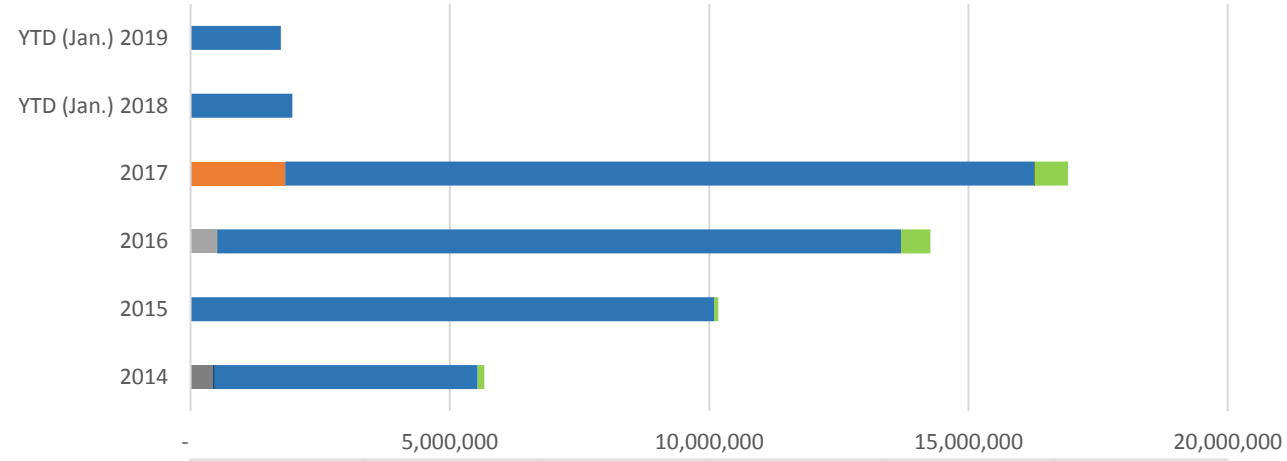
U.S. Imports of Uranium Compounds (Oxide, Hexafluoride, and Other) from the World (Pounds) 2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	-	-	-	122,784	21,676	433,804	-	-	-	-	-
India	11	-	-	-	-	-	-	-	-	-	-
Kazakhstan	-	259,568	-	366,128	78,238	-	-	-	1,834,945	-	-
Uzbekistan	1,828,388	1,327,183	661,387	330,693	345,747	-	-	507,063	-	-	-
France	5,075	5,633	9	-	-	-	-	6,746	448	-	-
Japan	-	950	2,555	-	2,868	-	-	-	265	-	-
Italy	-	-	-	-	-	-	302	-	-	-	-
Russia	-	-	-	-	44,661	21,973	-	-	-	-	-
Belgium	-	-	9	-	-	-	-	-	-	-	-
Germany	-	-	-	4	-	-	115	-	-	-	-
Canada	8,733,767	9,437,747	19,646,933	3,719,851	11,200,352	5,078,553	10,092,485	13,183,813	14,439,233	1,962,604	1,739,106
Korea	-	-	-	44	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	4,696	-	-
Namibia	-	-	-	-	353	-	-	-	-	-	-
Switzerland	-	-	-	-	143	-	-	-	-	-	-
United Kingdom	2	110	77	-	-	-	143	-	2	-	-
China	11	-	-	-	-	-	-	-	-	-	-
South Africa	884,045	671,596	827,644	453,729	990,001	132,339	85,709	568,321	643,803	-	-
Netherlands	69,122	-	-	-	50,340	-	-	-	-	-	-

Source: USITC Data Web, HTS Code: 2612.10.20

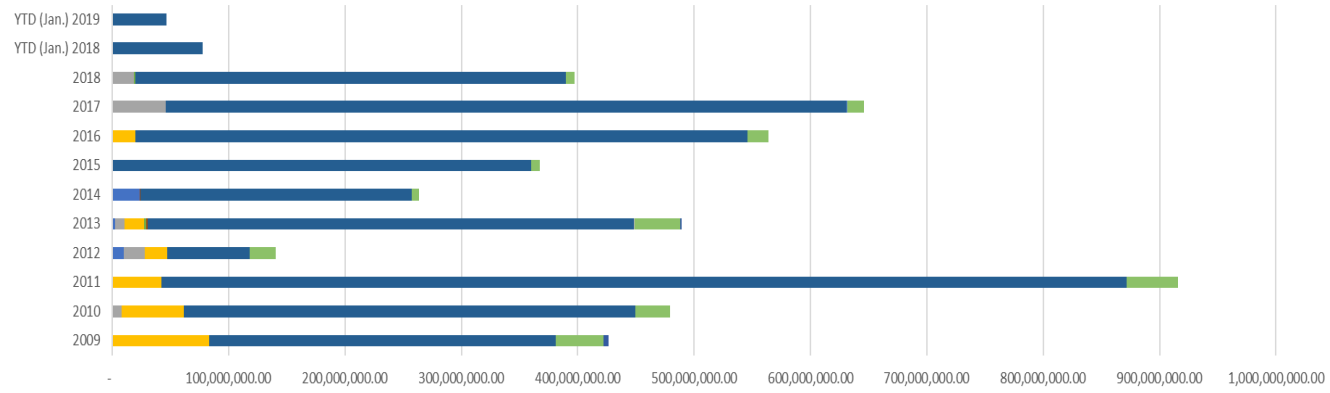
U.S. Imports of Uranium Compounds (Oxide, Hexafluoride, and Other) from the World (Pounds)
2009 – YTD January 2019



	2014	2015	2016	2017	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	433,804	-	-	-	-	-
Kazakhstan	-	-	-	1,834,945	-	-
Uzbekistan	-	-	507,063	-	-	-
France	-	-	6,746	448	-	-
Japan	-	-	-	265	-	-
Italy	-	302	-	-	-	-
Russia	21,973	-	-	-	-	-
Germany	-	115	-	-	-	-
Canada	5,078,553	10,092,485	13,183,813	14,439,233	1,962,604	1,739,106
Sweden	-	-	-	4,696	-	-
United Kingdom	-	143	-	2	-	-
South Africa	132,339	85,709	568,321	643,803	-	-

Source: USITC Data Web, HTS Code: 2612.10.20

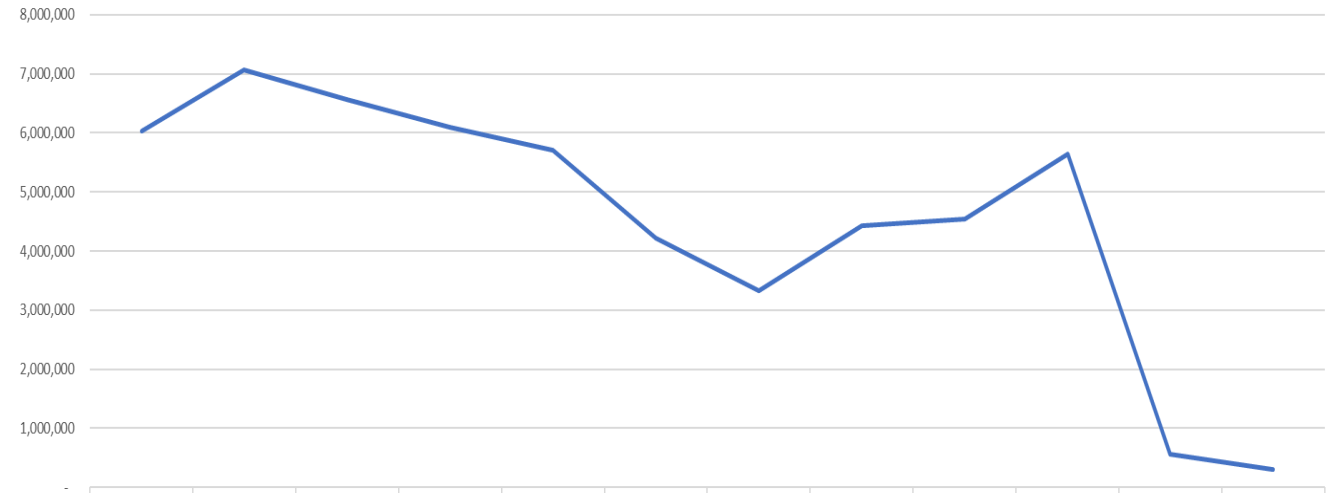
U.S. Imports of Uranium Compounds (Oxide, Hexafluoride, and Other) from the World (USD)
2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	-	-	-	$9,890,285	$2,470,650	$23,364,010	-	-	-			
India	$3,000	-	-	-	-	-	-	-	-			
Kazakhstan	-	$8,004,960	-	$17,944,454	$8,245,414	-	-	-	$46,113,524	$18,863,466.00		
Uzbekistan	$83,121,732	$53,333,994	$42,366,014	$19,197,101	$16,610,390	-	-	$19,769,642	-			
France	$231,393	$364,663	$3,425	-	-	-	-	$230,985	$12,023			
Japan	-	$42,324	$66,552	-	$2,151,834	-	-	-	$4,001	$1,139,615.00		
Italy	-	-	-	-	-	-	$4,729	-	-			
Russia	-	-	-	-	$1,202,105	$591,408	-	-	-			
Belgium	-	-	$4,973	-	-	-	-	-	-			
Germany	-	-	-	$8,864	-	-	$3,101	-	-			
Canada	$297,646,023	$388,031,933	$828,980,765	$71,301,778	$417,851,042	$233,555,939	$359,946,560	$526,074,443	$585,218,122	$369,751,785	$77,875,524	$46,614,660
Korea	-	-	-	$20,000	-	-	-	-	-			
Sweden	-	-	-	-	-	-	-	-	$58,142			
Namibia	-	-	-	-	$3,146	-	-	-	-			
Switzerland	-	-	-	-	$51,047	-	-	-	-			
United Kingdom	$2,802	$6,820	$4,610	-	-	-	$3,846	-	$2,043			
China	$2,890	-	-	-	-	-	-	-	-			
South Africa	$41,395,000	$29,447,566	$44,192,528	$22,197,674	$39,367,381	$5,848,871	$7,762,832	$17,582,718	$14,506,099	$7,669,488.00		
Netherlands	$3,983,602	-	-	-	$1,427,853	-	-	-	-			

Source: USITC Data Web, HTS Code: 2612.10.20

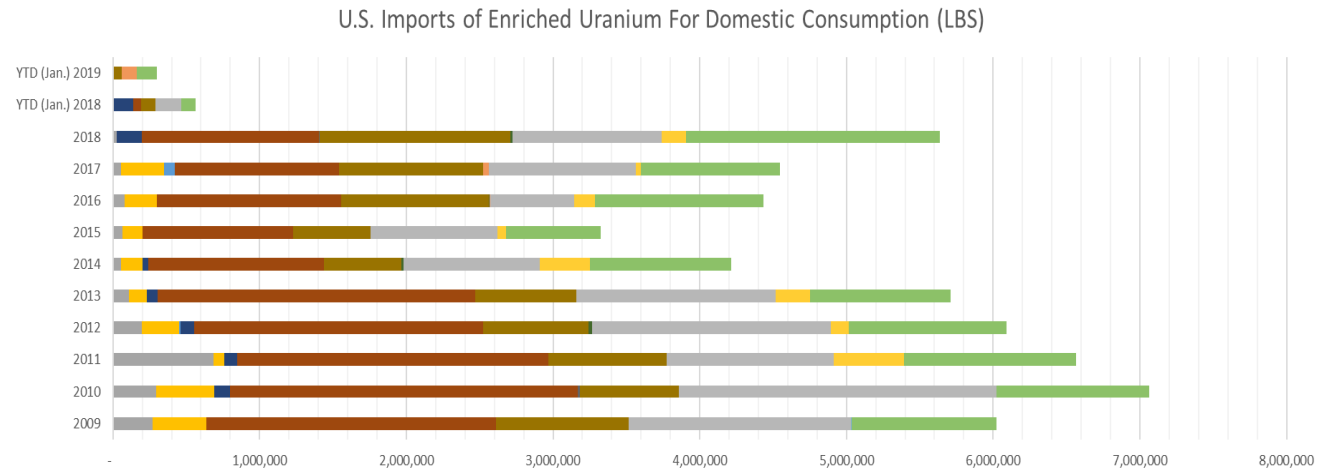
U.S. Imports of Enriched Uranium From the World (Pounds)
2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (LBS)	6,024,197	7,063,401	6,565,611	6,088,782	5,710,764	4,216,786	3,325,016	4,436,594	4,545,586	5639001.379	564,998.48	301,932

Source: USITC Data Web, HTS Code: 2844.20.00

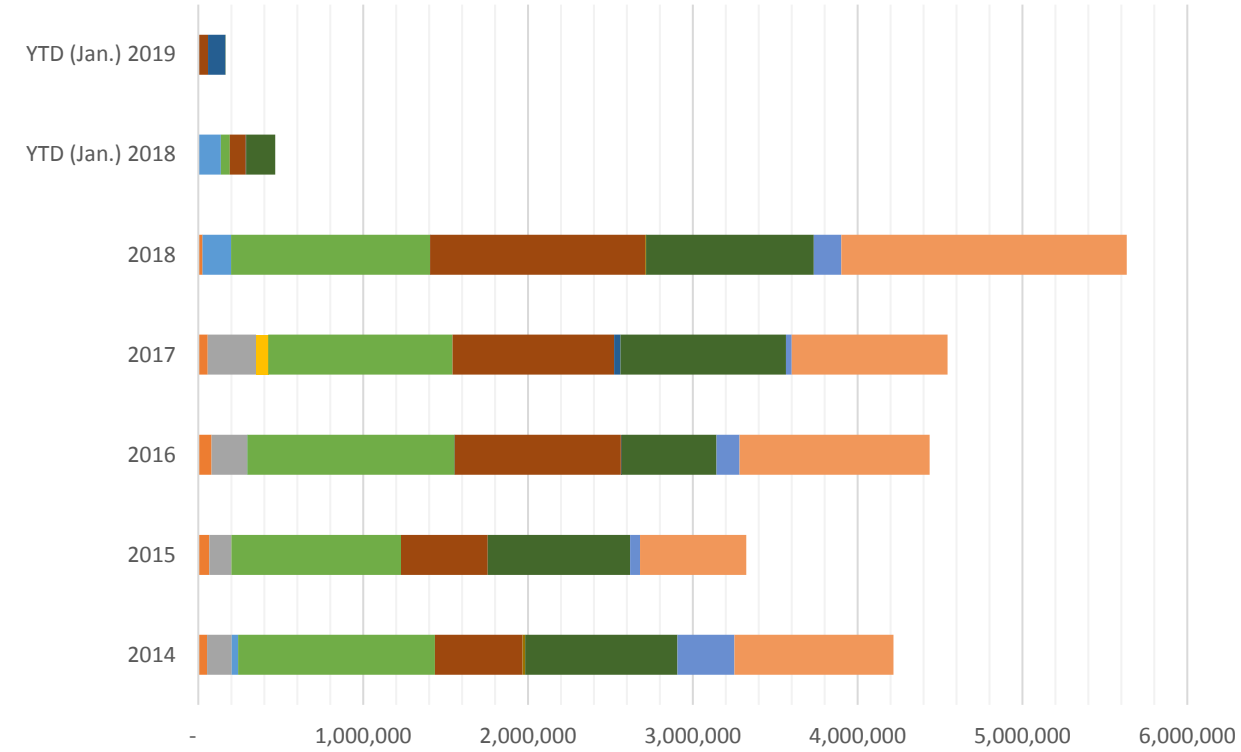
U.S. Imports of Enriched Uranium (Pounds)
2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	-	-	-	-	-	1,041	203	-	1,519	3,102	-	-
India	-	15	49	-	-	-	-	-	-		-	-
Kazakhstan	269,092	296,639	685,748	196,648	110,253	51,685	66,505	79,865	55,892	22,487	-	-
France	365,507	393,865	75,283	256,682	122,072	150,955	134,204	217,997	292,355	344	-	-
Spain	-	-	-	8,212	-	-	-	-	73,372	-	-	-
Taiwan	-	-	-	97	-	-	-	-	-	-	-	-
Japan	-	106,404	85,996	93,231	72,611	37,190	-	419	-	172,234	137,696	-
Russia	1,977,921	2,372,833	2,121,511	1,969,824	2,165,208	1,195,408	1,029,532	1,258,361	1,119,516	1,207,622	52,763	
Belgium	-	13,614	60	-	-	-	-	2	-	1,490		
Germany	900,588	672,154	805,578	716,959	688,823	532,092	525,503	1,007,583	980,704	1,303,170	98,458	59,033
Belarus	-	-	-	-	-	-	-	370	-	-	-	-
Canada	-	-	899	24,727	-	14,174	-	2,976	-	12,181	-	-
Korea	-	-	-	-	22	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	2,264	38,325	1,702	439	104,865
United Kingdom	1,519,474	2,167,120	1,139,700	1,628,720	1,357,686	925,102	864,668	575,049	1,004,210	1,017,259	177,106	2
China	-	-	478,176	120,403	237,394	344,858	58,773	138,964	33,843	166,680	-	-
Argentina	3,252	-	-	-	-	-	-	-	-		-	-
Netherlands	988,425	1,040,758	1,172,612	1,073,279	956,694	964,282	645,628	1,152,742	945,849	1,730,730	98,536	137,965

Source: USITC Data Web, HTS Code: 2844.20.00

U.S. Imports of Enriched Uranium (Pounds)
2009 – YTD January 2019



	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	1,041	203	-	1,519	3,102		
Kazakhstan	51,685	66,505	79,865	55,892	22,487		
France	150,955	134,204	217,997	292,355	344		
Spain	-	-	-	73,372			
Japan	37,190	-	419	-	172,234	137,696	-
Russia	1,195,408	1,029,532	1,258,361	1,119,516	1,207,622	52,763	
Belgium	-	-	2	-	1,490		
Germany	532,092	525,503	1,007,583	980,704	1,303,170	98,458	59,033
Belarus	-	-	370	-			
Canada	14,174	-	2,976	-	5,525		
Sweden	-	-	2,264	38,325	1,702	439	104,865
United Kingdom	925,102	864,668	575,049	1,004,210	1,017,259	177,106	2
China	344,858	58,773	138,964	33,843	166,680	-	-
Netherlands	964,282	645,628	1,152,742	945,849	1,730,730		

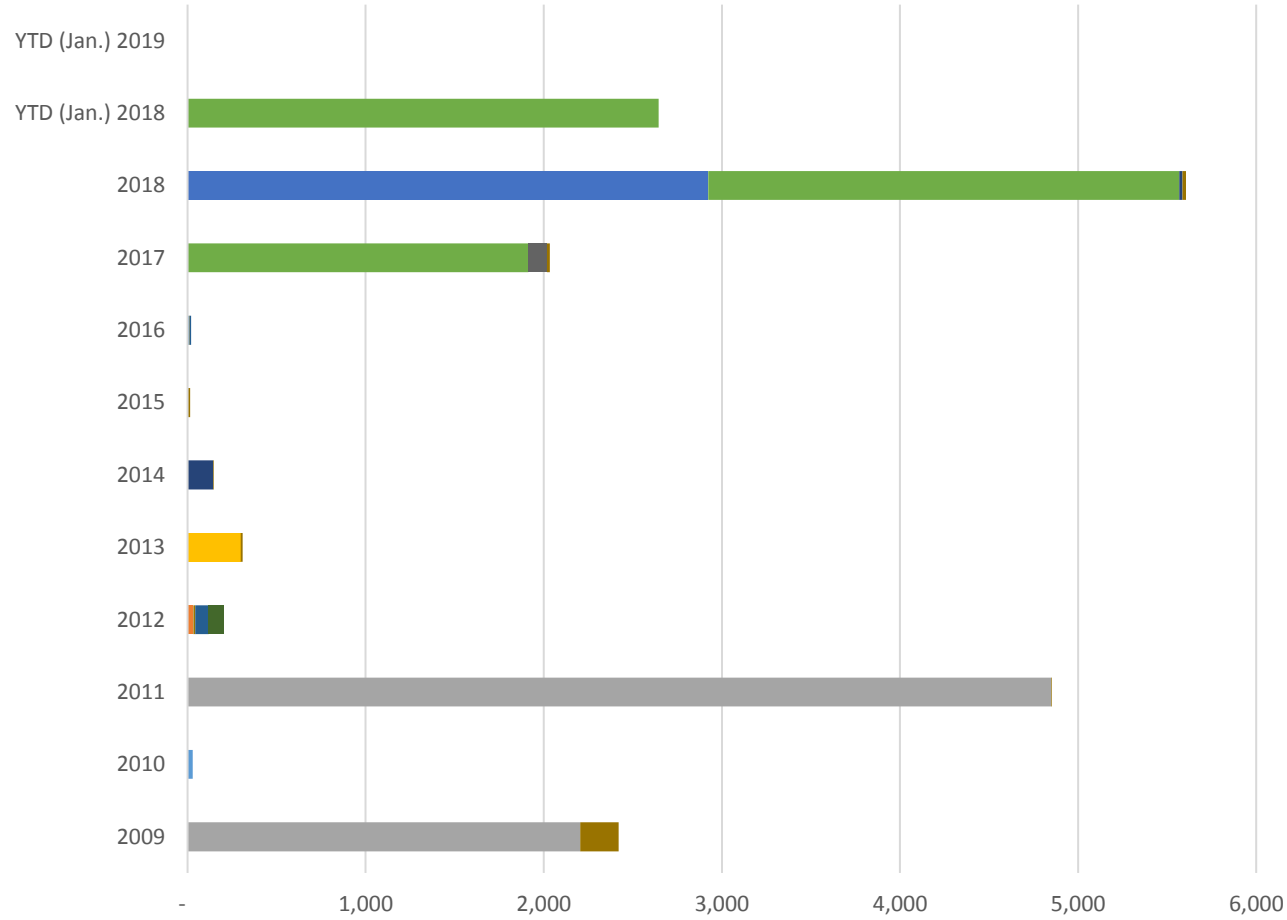
Source: USITC Data Web, HTS Code: 2844.20.00

U.S. Imports of Natural Uranium Metal and Forms of Natural Uranium Other Than Compounds From the World (Pounds)
2009 – YTD January 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (LBS)	2,421	29	4,852	205	309	148	15	20	2,035	5,606	2,646	-

Source: USITC Data Web, HTS Codes: 2844.10.10 and 2844.10.50

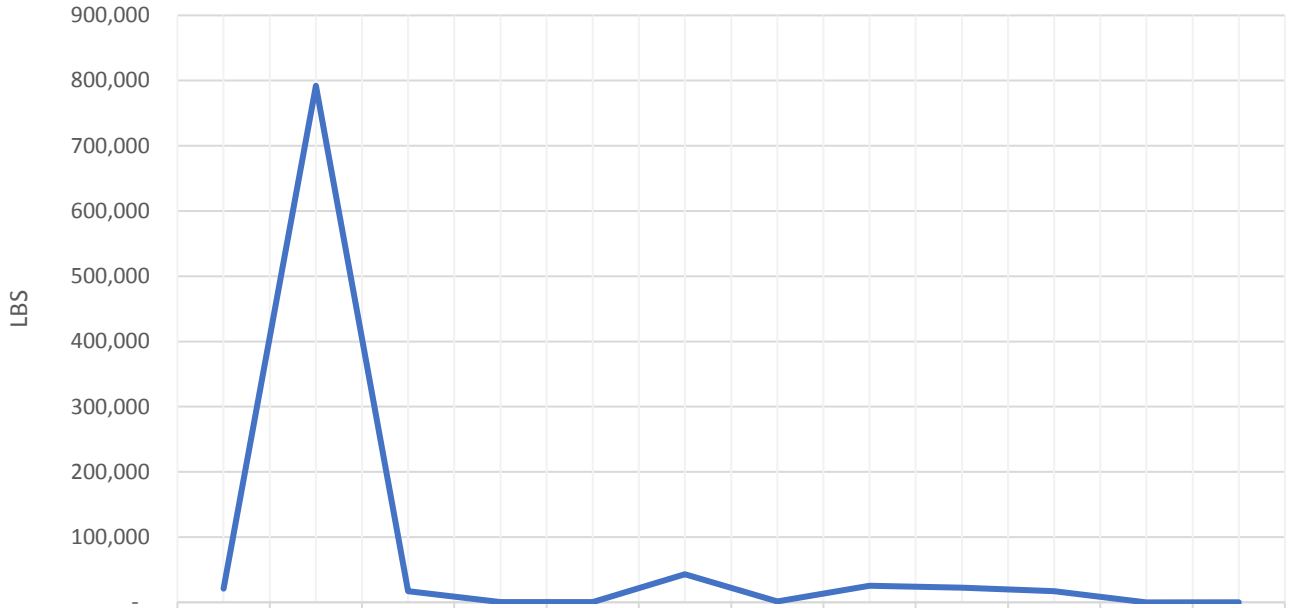
U.S. Imports of Natural Uranium Metal and Forms of Natural Uranium Other Than Compounds (Pounds) 2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
France	-	-	-	-	-	-	-	-	-	2,923	-	-
Japan	-	-	-	33	-	-	-	-	-		-	-
Russia	2,205	2	4,850	-	2	-	-	2	-		-	-
Hong Kong	-	-	-	-	295	-	-	-	-		-	-
Austria	-	26	-	-	-	-	-	4	-		-	-
Canada	-	-	-	-	-	-	-	-	1,914	2,646	2,646	-
Korea	-	-	-	-	-	143	-	-	-	18	-	-
Sweden	-	-	-	-	-	-	2	-	-		-	-
Switzerland	-	-	-	-	-	-	-	-	104		-	-
United Kingdom	216	-	2	11	11	4	13	4	18	20	-	-
China	-	-	-	75	-	-	-	9	-		-	-
Netherlands	-	-	-	86	-	-	-	-	-		-	-

Source: USITC Data Web, HTS Codes: 2844.10.10 and 2844.10.50

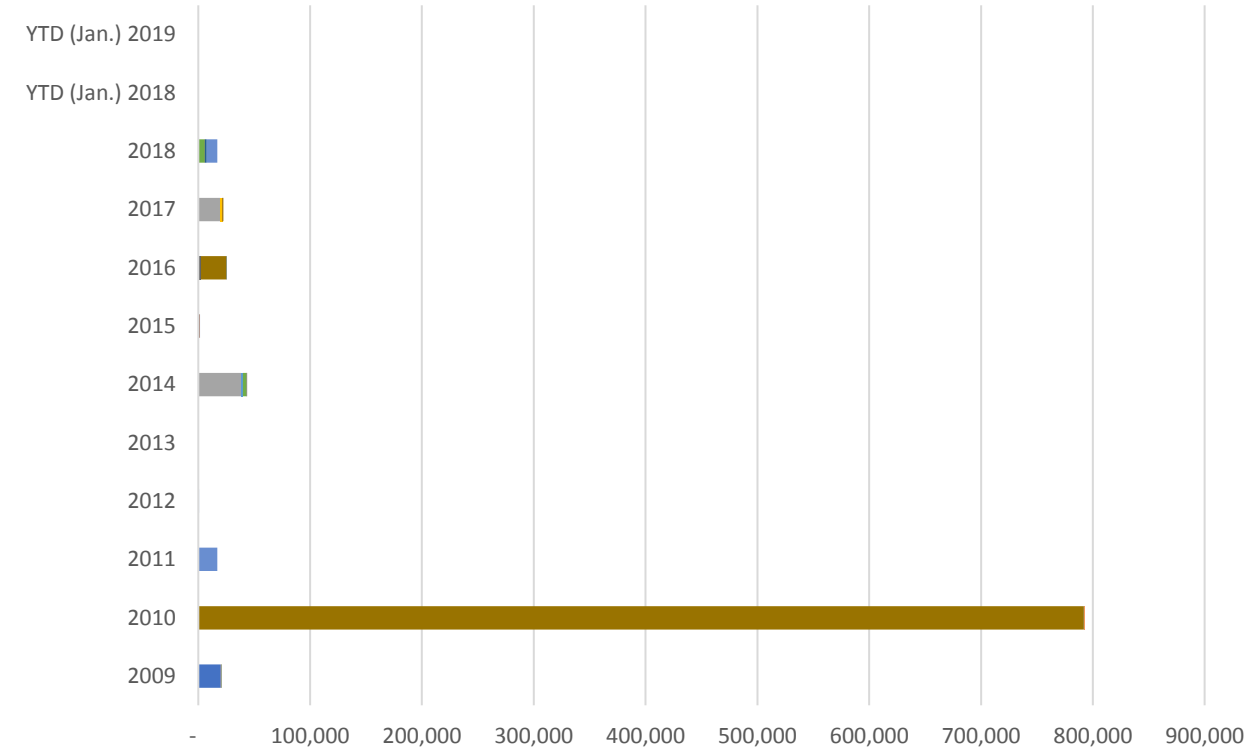
U.S. Imports of Depleted Uranium From the World (Pounds)
2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Quantity (LBS)	20,772	792,10	16,925	509	128	43,268	1,402	25,519	22,551	17,004	2	-

Source: USITC Data Web, HTS Codes: 2844.30.20 and 2844.30.50

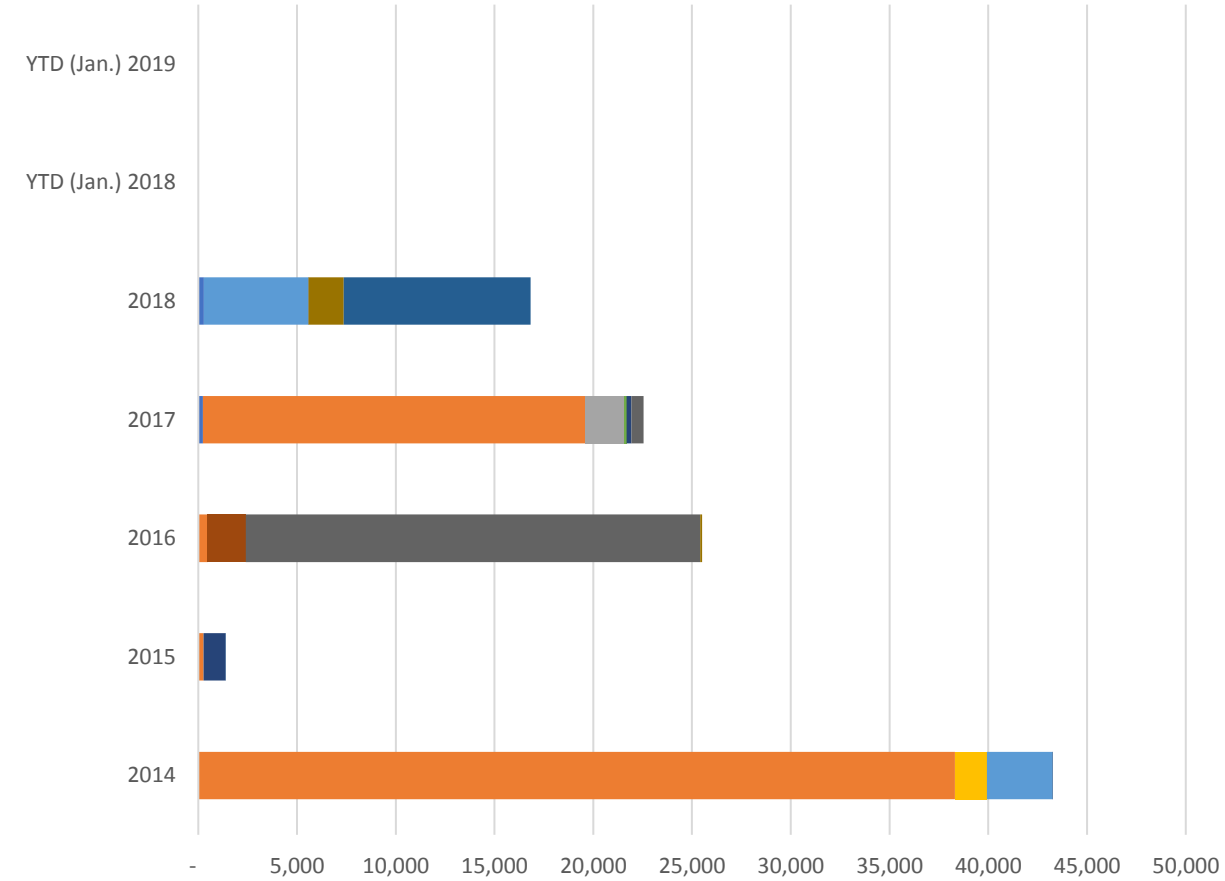
U.S. Imports of Depleted Uranium (Pounds)
2009 – YTD January 2019



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	20,241	-	-	-	-	-	-	33	236	287	-	-
Finland	71	-	-	-	-	-	-	-	-	183	-	-
France	-	-	-	-	-	38,310	260	437	19,341		-	-
Taiwan	-	-	-	-	-	-	-	-	1,984		-	-
Italy	-	-	-	-	-	1,625	-	-	-		-	-
Russia	4	-	-	-	-	3,316	-	-	-	5,287	-	-
Belgium	-	-	-	498	-	-	-	-	119		-	-
Germany	-	4	-	-	77	9	1,124	-	254	9	2	-
Czech Republic	-	-	-	-	-	-	-	1,938	-		-	-
Canada	9	792,015	55	-	37	-	-	23,007	617		-	-
Korea	-	-	-	-	-	-	-	104	-	1,788	-	-
Switzerland	-	-	-	-	4	-	-	-	-		-	-
United Kingdom	448	9	16,870	11	9	9	18	-	-	9,451	-	-
China	-	73	-	-	-	-	-	-	-		-	-

Source: USITC Data Web, HTS Codes: 2844.30.20 and 2844.30.50

U.S. Imports of Depleted Uranium for Domestic Consumption (Pounds) 2014-2018



	2014	2015	2016	2017	2018	YTD (Jan.) 2018	YTD (Jan.) 2019
Australia	-	-	33	236	287	-	-
France	38,310	260	437	19,341		-	-
Taiwan	-	-	-	1,984		-	-
Italy	1,625	-	-	-		-	-
Russia	3,316	-	-	-	5,287	-	-
Belgium	-	-	-	119		-	-
Germany	9	1,124	-	254	9	2	-
Czech Republic	-	-	1,938	-		-	-
Canada	-	-	23,007	617		-	-
Korea	-	-	104	-	1,788	-	-
United Kingdom	9	18	-	-	9,451	-	-

Source: USITC Data Web, HTS Codes: 2844.30.20 and 2844.30.50

Appendix G

Appendix G. Summary of the 1989 Section 232 Uranium Investigation

The Secretary is aware of the historic challenges facing the U.S. uranium industry, and the effects of foreign imports. In February 1989, the Secretary initiated a Section 232 investigation into the effects of uranium imports on the national security at the request of the Secretary of Energy.[1] The Secretary of Energy's request stemmed from a congressionally mandated study of the U.S. uranium mining industry. In the Nuclear Regulatory Commission's 1983 appropriations bill[2], Congress amended the Atomic Energy Act of 1954 to include Section 170b. Section 170b directed the Secretary of Energy to undertake annual studies of the U.S. uranium mining industry for the 1983-1992 period and to make a determination each year concerning the industry's viability.

In Section 170b, Congress outlined factors for the Secretary of Energy to consider in determining the industry's viability. These included:

(1) an assessment of whether executed contracts or options for source material or special nuclear material will result in greater than 37.5 percent of actual or projected domestic uranium requirements for any two-consecutive-year period being supplied by source material or special nuclear material from foreign sources;

(2) projections of uranium requirements and inventories of domestic utilities for a 10-year period;

(3) present and probable future use of the domestic market by foreign imports;

[1] U.S. Department of Commerce, "The Effect of Imports of Uranium on the National Security", September 1989, I-1. (hereafter, 1989 Report)

[2] Public Law 97-415

(4) whether domestic economic reserves can supply all future needs for a future 10-year period;

(5) present and projected domestic uranium exploration expenditures and plans;

(6) present and projected employment and capital investment in the uranium industry;

(7) the level of domestic uranium production capacity sufficient to meet projected domestic nuclear power needs for a 10 year period; and

(8) a projection of domestic uranium production and uranium price levels which will be in effect under various assumptions with respect to imports.[3]

By establishing a threshold of foreign imports as a percentage of U.S. domestic uranium needs, as indicated in factors 1, 3, and 8, Congress concluded that foreign imports had the potential to negatively affect U.S. domestic uranium producers. Congress further expanded on this finding by mandating the Secretary of Energy to evaluate foreign suppliers' interest in the U.S. market as well as their impact on U.S. production and market uranium prices. In including these factors together, Congress made it clear that even if foreign uranium suppliers were not currently threatening the viability of U.S. producers, they nevertheless may do so in the future.

[3] Atomic Energy Act of 1954, Sec. 170 (b)(c)

Should the Secretary of Energy determine that the 37.5 percent import threshold was met or otherwise determine that foreign imports may threaten to impair the national security, the Secretary of Energy was to then request the Department to initiate a Section 232 investigation.[4] In its own investigation, the Department was required to take into account any information obtained during the Department of Energy's own investigations into the U.S. industry's viability.[5]

In his December 1988 letter requesting the investigation, the Secretary of Energy noted that uranium imports far exceeded the 37.5 percent threshold. U.S. utilities imported 43.8 percent of their uranium requirements in 1986 and 51.1 percent in 1987.[6] Consequently, the Secretary requested the 232 investigation.

The Secretary of Energy also concluded in the same letter that the U.S. uranium industry was not viable during calendar year 1987. DOE had issued similar determinations of non-viability in 1984, 1985, and 1986.[7] Although the Secretary of Energy's analysis found that U.S. producers had sufficient reserves to supply civil nuclear power generation needs for the next 10 years, low revenues and poor profitability could be expected in the same period. These factors, due in part to competition from cheap imports, would restrict the

[4] Atomic Energy Act of 1954, Sec 170(b)(e)1
[5] Ibid.
[6] 1989 Report, Tab A.
[7] Supreme Court of the United States, Huffman v. Western Nuclear Inc (1988) No. 87-645, https://caselaw findlaw.com/us-supreme-court/486/663 html

industry's ability to make capital investments needed to ensure future productive capacity.[8] Based on this analysis, the Secretary of Energy therefore requested the Department to initiate the Section 232 investigation.

As with the present investigation, the 1989 investigation was comprehensive and examined both the entire front-end nuclear fuel cycle as well as the state of U.S. nuclear power generators. Many industry trends identified in the current investigation also featured prominently in the 1989 investigation. The 1989 investigation noted that the industry was highly concentrated among a few companies. In 1977, 135 companies engaged in mining; by 1987, only 26 remained.[9] The number of active uranium mills also declined from 17 to six during the same period. Uranium-related landholdings also dropped by 90 percent between 1978 and 1987.[10] Employment also dramatically declined; between 1979 and 1987, uranium industry employment dropped by 91 percent.[11] The industry's decline during this period was due to an anticipated boom in nuclear energy that never materialized. As the uranium industry in recent years was affected by the Fukushima disaster, so too was the industry in the 1980s affected by the Three Mile Island and Chernobyl disasters.

[8] 1989 Report, DOE Determination on Uranium Industry Viability, 2.
[9] 1989 Report, III-2
[10] Ibid.
[11] Ibid, III-10.

U.S. utilities' dependence on foreign uranium source was expected to continue through 2000. In 1987, U.S. utilities imported 51.1 percent of their uranium requirements.[12] According to EIA data, imports were predicted to rise from 52.2 percent of yearly requirements in 1988 to a peak of 70.8 percent in 1992.[13] By 2000, however, additional U.S. capacity was anticipated to reduce foreign sources' market share to 48.4 percent.[14] While foreign import penetration would be mitigated by increased U.S. production, import levels were expected to remain in excess of the 37.5 percent threshold.

The report also observed that U.S. enrichers no longer had a monopoly on the U.S. enriched uranium market; policy changes by DOE allowed U.S. utilities to purchase foreign enriched materials. Increased competition on the U.S. market therefore incentivized expansion of foreign enrichment services. Between 1990 and 2000, the Department predicted that URENCO's enrichment capacity would more than double, and Japan's would increase by 1,200 percent.[15] In contrast, no expansion or increase in U.S. capacity was forecast during the same period. U.S.

[12] 1989 Report, Secretary of Energy to Secretary of Commerce, Letter Requesting 232 Investigation, December 30, 1988

[13] Ibid, III-21.
[14] Ibid.
[15] Ibid.

enrichers' share of the domestic and global markets would also be challenged by "an expanding and aggressive Soviet enterprise".

[redacted][17]

Material changes in the U.S. uranium industry since 1989, however, indicate that the United States no longer possesses sufficient available supplies of uranium to address a national emergency. [redacted][18] In 2018, U.S. uranium production stood at an aggregate of just 1.9 million pounds, with production expected to fall to 532,000 in 2019.

[redacted]

[16] Ibid, VI.
[17] Ibid.
[18] Ibid., V-3.

[redacted]

If U.S. supplies of uranium include significant imports from any nation, regardless of that country's relationship with the United States, the Department cannot conclude that the United States has sufficient supplies of uranium. This interpretation of the statue's requirement to consider the "impact of foreign competition" was also used in the Department's 2018 investigations into imports of steel and aluminum.

The 1989 investigation also determined that defense requirements (e.g. Navy nuclear fuel and weapons) could be met by existing uranium supplies. However, the same conclusion cannot be supported in 2019. In the 1989 investigation, the Office of Naval Reactors expressed its confidence that "ample facilities" existed in the United States for naval nuclear fuel purposes.[19] In 2019, however, these "ample facilities" no longer exist. Most notably, there is no uranium enrichment facility in the United States that can be used to produce new HEU for naval nuclear fuel or any other defense purpose purposes; two such facilities existed at the time of the 1989 investigation.[20] The only currently active U.S.-based enrichment

[19] Ibid, V-2.
[20] Ibid., III-10.

services provider, URENCO's Louisiana Energy Services facility in New Mexico, is forbidden by treaty from producing any enriched uranium for military purposes.[21]

The material factors and analytic framework supporting the Department's determination in the 1989 investigation that imports of uranium did not threaten to impair the national security are not applicable in 2019. A loss of U.S. mining capacity, combined with a complete lack of enrichment capability for national defense uranium needs, make the U.S. more dependent than ever on imports of uranium. Furthermore, the Department's current analysis demonstrates that a dependence on imports from any country, even U.S. allies, is incompatible with Section 232's mandate for the Secretary to consider whether excess imports are "weakening our internal economy".

[21] Article III of the 1992 agreement between the United States and the United Kingdom, Germany, and the Netherlands governing the construction of the URENCO facility in the United States specifies that any material enriched at the facility will be used only for "peaceful, non-explosive purposes."

Appendix H

Appendix H. The National Security Aspect of U.S. Uranium Industry Regulation

Legislation governing the nation's uranium and nuclear power generation industries has consistently acknowledged their national security role. The Atomic Energy Act of 1946, the first legislation governing the production and control of nuclear materials, laid out a national security interest in the development of domestic atomic energy resources:

> "Accordingly, it is hereby declared to be the policy of the people of the United States that, subject at all times to the *paramount objective of assuring the common defense and security*, the development and utilization of atomic energy, shall, so far as practicable, be directed toward improving the public welfare, increasing the standard of living, strengthening free competition in private enterprise, and promoting world peace."[1]

In support of these objectives, the 1946 act established U.S. government control over the "production, ownership, and use of fissionable material to assure the common defense and security"[2] All fissionable material, including enriched uranium, within the United States became property of the newly-established Atomic Energy Commission (AEC).[3] The act also clarified that all source material (e.g. uranium ore) located on public lands was "hereby reserved for the use of the

[1] Atomic Energy Act of 1946, Section 1(a)

[2] Ibid. Section 1(b)(4)

[3] Ibid.

United States."[4] The act also authorized the AEC to contract for uranium deposit exploration and to acquire uranium ore supplies as needed to support U.S. atomic energy initiatives.[5]

As nuclear technology developed, the legislation changed to recognize the potential for commercial development. The Atomic Energy Act of 1954 removed some of the restrictions established in 1946 on private use of fissile material. In particular, the 1954 legislation created a licensing system for private parties to receive enriched uranium material and operate uranium-related production facilities for commercial and research purposes.[6] This step was a significant advance on the 1946 legislation, which did not incorporate clearly defined opportunities for private enterprise. Like the 1946 legislation, the 1954 legislation articulated an explicit national security interest:

> The development, utilization, and control of atomic energy for military and for all other purposes are vital to *the common defense and security*…
>
> The processing and utilization of source, byproduct, and special nuclear material must be regulated in the national interest and in order to provide for *the common defense and security*…
>
> Source and special nuclear material, production facilities, and utilization facilities are affected with the public interest, and regulation by the United

[4] Ibid., Section 5(b)(7)

[5] Ibid., Section 5(b)(6)

[6] Atomic Energy Act of 1954, Secs 53a and 103a.

> States of the production and utilization of atomic energy and of the facilities used in connection therewith is necessary in the national interest to assure *the common defense and security*…[7]

The 1954 legislation contains no less than 100 instances of the phrase "common defense and security". Congress, by including these references, underlined the national security purpose of the uranium and nuclear power industries. This national security purpose is also seen in Section 53, which states all criteria for issuing private licenses for special nuclear materials (e.g., enriched material) is subordinated "degree of importance to the common defense and security". The 1954 legislation thus restates that development of the nation's uranium resources must be done in support of national security objectives.

Subsequent development of commercial nuclear power generation highlighted a problem with the 1954 act. Although it established a licensing mechanism for private use of enriched nuclear materials, the materials remained U.S. government property. This distinction between government ownership and private license complicated the nuclear supply chain and was perceived as restricting industry development. Congress thus passed the Private Ownership of Special Nuclear Materials Act in 1964 to provide for private title of enriched

[7] Ibid. Sec 2a, Sec 2d, Sec 2e.

nuclear materials.[8] This amendment did not, however, otherwise alter the licensing system established in 1954. Congress's 1964 action can be read as modification of the 1954 legislation in the interest of developing commercial nuclear power while preserving the overarching national security objective.

Congress also separately recognized the potential impact of imports of foreign source material for enrichment purposes. When Congress passed the 1964 legislation on private materials ownership, it established limitations on the origin of material that could be enriched in AEC-owned facilities:

> ..the Commission, to the extent necessary to assure the maintenance of a viable domestic uranium industry, shall not offer such [enrichment] services for source or special nuclear materials of foreign origin intended for use in a utilization facility within or under the jurisdiction under the United States.[9]

Under this provision, the AEC could impose limits and constraints on the amount of foreign-sourced uranium products that U.S. utilities could purchase. As the AEC was the sole provider of enrichment services in the non-communist world, it had significant power to influence utilities' purchasing decisions.

The language in Section 161(v) did not create an exemption for materials from U.S.-aligned countries. As Canada and Australia were both significant producers of uranium at the time and were formally allied with the United States;

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[8] Private Ownership of Special Nuclear Materials Act, Sec 3c

[9] Sec. 161(v), Atomic Energy Act of 1954.

Congress could have reasonably exempted imports from these and other U.S. allies. However, Congress's expressed intent was for Section 161(v) restrictions to "assure the maintenance of a viable domestic uranium industry". Congress implicitly acknowledged that a uniquely U.S. uranium industry was needed to support broader objectives of security and economic growth under the Atomic Energy Act, and as such did not believe that large scale use of non-U.S. uranium products by U.S. utilities was compatible with these objectives.[10]

AEC invoked Section 161(v) authority in 1966 and imposed a complete ban on any enrichment of non-U.S. materials for consumption by U.S. utilities.[11] This prohibition on enrichment remained in place until 1977, when it was lifted by regulation. By that time, enrichment facilities were planned or in operation in the United Kingdom, West Germany, Japan, and other non-communist countries. The AEC's monopoly over uranium enrichment was no longer guaranteed, meaning that the AEC could not reasonably restrict U.S. utilities' consumption of foreign-origin uranium.[12]

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[11] U.S. Department of Commerce, "The Effect of Imports of Uranium on the National Security", (September 1989), IV.

[12] Following the lifting of restrictions on enrichment of foreign sourced materials, some U.S. uranium producers expressed concern that DOE was not exercising its powers under Section 161(v). One of these producers, Western Nuclear, sued DOE in an attempt to force it to reimpose restrictions. In *Huffman v. Western Nuclear* (1988), the Supreme Court held that Section 161(v) granted DOE the discretion to determine what level of restrictions were necessary to guarantee U.S. uranium industry viability. While the Court maintained that DOE could decline to implement restrictions if it did not believe they would guarantee viability, it reaffirmed Congress's explicit interest in viability.

Although Congress later privatized U.S. government-owned enrichment facilities, it preserved the national security aspect of their regulation. The Energy Policy Act of 1992, which created the United States Enrichment Corporation (USEC) to manage the nation's enrichment facilities, specified that DOE could only sell supplies of uranium to USEC if such material was deemed "not necessary" to national security needs.[13] Congress further required DOE to establish that sales of material to USEC would not have a "substantial adverse impact" on the domestic uranium mining industry.

In imposing both national security and market analysis requirements on stockpile sales, Congress restated its belief in the importance of the U.S. uranium industry to national security. The same two-part requirement was included in the United States Enrichment Corporation Privatization Act of 1996.[14]

Since 1946, Congress has continually reaffirmed the importance of the uranium and nuclear power generation industries to national security. Congress has expressed its particular belief that the "common defense and security" requires Federal regulation of these industries and, if necessary, action to assist these industries in fulfilling their national security functions.

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[13] Energy Policy Act of 1992, Sec. 1013

[14] United States Enrichment Corporation Privatization Act of 1996, Sec 5(a)4.

Appendix I

Appendix I. The Role of State-Owned Uranium Enterprises in the Global Uranium Market

Russia

All uranium mines in Russia are owned and operated by the Russian state-owned integrated nuclear firm Rosatom. Rosatom operates its mines through Joint Stock Company ARMZ Uranium Holding Company (ARMZ). As of 2015, ARMZ's mines within Russia had an estimated 517,000 metric tonnes of uranium.[1] The Russian government views development of domestic uranium deposits as a top priority, and has directed other state-owned enterprises (SOEs) to assist ARMZ in exploration and development. In April and May 2015, the Russian Federal Council approved several financing packages and tax incentives to facilitate uranium mine development in the Far East[2], and later directed SOE Rosgeologia to conduct exploration in Karelia and Murmansk in northwestern Russia.[3]

In 2016, Russian uranium mines produced 3,005 metric tonnes of uranium; reactor consumption that year was approximately 4,600 metric tonnes.[4] Russia's

[1] World Nuclear Association, "Russia's Nuclear Fuel Cycle", (January 2019), http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-fuel-cycle.aspx

[2] Ibid.

[3] Ibid.

[4] International Atomic Energy Agency, "Uranium 2018: Resources, Production, and Demand" (December 2018), http://www.oecd-nea.org/ndd/pubs/2018/7413-uranium-2018.pdf, 337, 339.

nuclear fuel cycle thus depends on a steady supply of foreign-sourced uranium. To that end, Rosatom has engaged in joint ventures (JVs) with companies in Kazakhstan and Uzbekistan, and Tanzania to develop deposits in those countries. In Kazakhstan alone, Rosatom-owned Uranium One has majority control or substantial interest in mines totaling more than 11,000 metric tonnes of production in 2016. Uranium One also owns the Willow Creek deposit in the United States, and has previously owned assets in Australia and Kenya. Based on ARMZ's 2007 production plan including current and future deposits, both inside and outside Russia, ARMZ will likely produce more than 20,000 metric tonnes of uranium per year by 2025.[5]

Russia's uranium industry benefits from strong domestic demand and aggressive international marketing of its fuel products and nuclear reactor designs. As of 2018, Rosatom had a 10-year portfolio of overseas projects valued at more than $133 billion, spread out over 40 different countries.[6] Rosatom's customers are diverse and are not just limited to traditional Russian customers in China, India, Iran, and Belarus. The company is currently building reactors in Turkey and

[5] Ibid.

[6] Rauf Mammadov and Theodore Karasik, "Rosatom as a Tactic in Russia's Foreign Policy", *International Policy Digest* (July 19, 2018). https://intpolicydigest.org/2018/07/19/rosatom-as-a-tactic-in-russia-s-foreign-policy/

Bangladesh, and is contracted to build reactors in Finland, Slovakia, Egypt, and Uzbekistan.

In 2013, it provided 36 percent of EU members' enriched uranium and is an exclusive fuel supplier for existing reactors in Bulgaria, the Czech Republic, Hungary, and Slovakia.[7] With this diverse portfolio, Russian involvement in the global nuclear fuel cycle is not just a business choice; fundamentally, it is another means of exerting political influence.

State Subsidies and Anti-Competitive Practices

None of Rosatom's activities would be possible without robust state support. Russian government contributions constitute a significant percentage of Rosatom's operating budget. In the 2017-2019 state budget, Rosatom was allocated an average of $329 million per year, approximately 30-40 percent of Rosatom's annual capital expenditure.[8] State support has also enabled Rosatom to thrive even in the face of U.S. and European Union sanctions. In October 2017, Rosatom Director-General Alexey Likhachev observed that sanctions have not

[7] European Commission, "Commission Staff Working Document: In-depth study of European Energy Security" (July 2, 2014), https://ec.europa.eu/energy/sites/ener/files/documents/20140528_energy_security_study_0.pdf, 76.

[8] "Rosatom Secures New State Funding", *Energo CEE/FSU Power* (October 20, 2016), https://newsbase.com/topstories/rosatom-secures-new-state-funding

stopped Rosatom's foreign order book from exceeding $300 billion.[9] In a subsequent January 2019 interview, Likhachev anticipated that Rosatom would be able to maintain a 60 percent share of the global nuclear power plant construction market through the end of the 2020s.[10] Rosatom cannot maintain this market share without significant infusions of Russian state funds. Extensive state support also allows Rosatom to develop and deploy new technologies at a faster rate than similar market producers. Rosatom has constructed "Generation III" reactors, which offer longer service lives and significant safety enhancements over older reactors, at the Novovorenzh and Leningrad Nuclear Power Plants.[11] The company has also constructed the *Akademik Lomonosov,* the lead ship in a class of floating nuclear power generators with a capacity of 70 meagwatts, the *Akademik Lomonosov* will replace aging nuclear power plants in the Russian Far East.

[9] World Nuclear Association, "Rosatom chief sees no impact from sanctions", *World Nuclear News*, (October 23, 2017), http://www.world-nuclear-news.org/C-Rosatom-chief-sees-no-impact-from-sanctions-23101702 html

[10] "Rosatom plans to retain its leading role in global NPP construction in the coming decade", *TASS Russian News Agency* (January 13, 2018), http://tass.com/economy/1039633

[11] World Nuclear Association, "Advanced Nuclear Power Reactors", (October 2018), http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/advanced-nuclear-power-reactors.aspx; World Nuclear Asssociation "Leningrad II-1 starts pilot operation", *World Nuclear News* (March 9, 2018) http://www.world-nuclear-news.org/NN-Leningrad-II-1-starts-pilot-operation-09031801.html

Rosatom also anticipates that developing nations will be interested in similar floating plants as a means of providing low-cost electricity. [12]

State support, as well as Rosatom's control of the fuel cycle, allow the company to engage in non-market business practices. For example, Rosatom's fuel division TVEL purchases uranium from ARMZ at below market rate fixed-price contracts. [13] In 2007 alone, had TVEL purchased uranium at the average global spot price in 2007, it would have incurred $474 million in extra costs, a figure exceeding TVEL's net profits that year.[14] TVEL also sells enriched uranium product (EUP) to foreign customers at a rate that includes the cost of uranium hexafluoride conversion, giving it another edge over market producers. This is particularly detrimental to ConverDyn, the sole U.S. uranium converter. State support allows TVEL to sell uranium hexafluoride at "low/no cost" to customers, thus undermining market producers such as ConverDyn.

[12] World Nuclear Association, "Floating plant arrives at Murmansk for fueling", *World Nuclear News* (May 21, 2018), http://www.world-nuclear-news.org/NN-Floating-plant-arrives-at-Murmansk-for-fueling-2105184.html

[13] In 2005, ARMZ sold uranium concentrate at approximately $16.50 per pound. At the time, global spot price averaged $28.50 per pound. For more, consult Leonid Andreev, "The Economics of the Russian Nuclear Power Industry", Bellona Foundation (2011), https://network.bellona.org/content/uploads/sites/3/fil_Economics-of-the-Russian-Nuclear-Power-Industry-English.pdf, 27.

[14] Ibid., 30

Finally, Rosatom is also able to undercut competitors through large scale re-enrichment of deplete uranium tailings, or tails.[15] Low-cost power and legacy enrichment capacity from the Soviet era make it economically feasible for Rosatom to re-enrich and sell these tails on the market as another source of enriched uranium.[16] Through its sales arm Tenex, Rosatom offers foreign utility customers enriched uranium product without the need to separately procure uranium oxide compounds and subsequent conversion and enrichment services.

Rosatom as Geopolitical Tool: Ukraine

The Russian government also uses other assets to assist Rosatom in undercutting global competition and advancing Russia's geopolitical objectives. This is particularly true in Ukraine, where U.S.-based Westinghouse has had agreements with Ukrainian state nuclear operator Energoatom to provide fuel assemblies for the country's Russian-designed reactors since 2008. Although early test operations in 2005 were successful, deployment of Westinghouse assemblies for large-scale refueling in 2009 and 2010 were deemed to be a failure.[17]

[15] Depleted uranium tailings are a by-product of the enrichment process. These can be re-enriched to produce enriched uranium.

[16] U.S. International Trade Commission, "Uranium from Russia – Investigation No. 731-TA-539-C" (September 2017), https://www.usitc.gov/publications/701_731/pub4727.pdf, I-39.

[17] World Nuclear Association, "More Westinghouse fuel for Ukraine", *World Nuclear News* (April 11, 2014), http://www.world-nuclear-news.org/ENF-More-Westinghouse-fuel-for-Ukraine-1104144.html

Ukrainian nuclear inspectors claimed that the assemblies were scratched and could not be safely installed in the reactors. However, based on press reports, the chief inspector overseeing the test likely had connections to Russian agents operating within Energoatom; the inspector's reports detailing the Westinghouse assemblies' failures were rejected as technically inaccurate.[18]

Russian intelligence services have also targeted Westinghouse's industrial operations. In July 2018, the Department of Justice indicted a Russian intelligence officer for hacking into the accounts of several Westinghouse employee. The officer in question obtained login information for two employees with direct access to sensitive information about Westinghouse's reactor designs.[19]

To assist in its ongoing campaign against Westinghouse, Russia has also employed media disinformation tactics. From October to December 2018, Russian state-connected media outlets ran no less than 15 different articles alleging gross misconduct on the part of Westinghouse and the U.S. government.

[18] Sara Lynn McPhee, "The Competition for the Ukrainian Nuclear Fuel Cycle: Rosatom, Westinghouse, and Implications for Nuclear Energy in the Near Abroad", (2015), 38.

[19] United States District Court for the Western District of Pennsylvania, *United States v. Morenets, Serebriakov, Yermakov, Malyshev, Badin, Sotnikov, and Minin*, (October 3, 2018), https://www.justice.gov/opa/page/file/1098481/download, 12.

According to these articles, Westinghouse's fuel assemblies are unsafe and could potentially cause a meltdown on the scale of the Chernobyl disaster.[20]

[redacted][21]

U.S. Response to Russian Actions in the Nuclear Fuel Trade

Over the 2014-2018 period, Rosatom provided U.S. utilities with approximately 19 percent of their enrichment services and approximately 10 percent of their conversion services. Rosatom's presence on the U.S. market is currently restricted by the Russian Suspension Agreement. However, Rosatom is hopeful that future policy changes will enable it to supply 30-35 percent of U.S. enriched uranium needs after 2020, when the agreement is due to expire.[22]

The United States recognizes that Rosatom is heavily subsidized by the Russian government. The USTR's 2016 and 2017 National Trade Estimate Reports on Foreign Trade Barriers expressed concerns that government subsidies

[20] Examples of this include "How US Creates Safety Risks for Nuclear Power Plants in Europe", *Sputnik News* (May 21, 2016), https://sputniknews.com/business/201605211040019677-us-nuclear-fuel-europe/, and Kenneth Rapoza, "How Washington is Fighting for Russia's Old Europe Energy Market", *Forbes* (May 17, 2016), http://www.forbes.com/sites/kenrapoza/2016/05/17/washingtons-european-energy-security-boondoggle/#4f8ebb2762ef. Rapoza is a contributor to Russia Insider, which is itself connected to state owned media outlets within Russia.

[21] [redacted]

[22] "Russia plans to increase US uranium market presence by 25-35% by 2020", *Sightline U3O8* (June 22, 2017), https://sightlineu3o8.com/2017/06/russia-plans-to-increase-us-uranium-market-presence-from-25-35-by-2020/

allow Rosatom to expand capacity despite a global supply glut.[23] In its 2017 review of Russian uranium imports, the United States International Trade Commission found that Rosatom's activities are oriented towards export and that an increased Rosatom presence on the U.S. market would be detrimental to U.S. producers.[24] Rosatom's global activities, subsidized by the Russian state, are also undercutting U.S. producers and hinder their ability to compete on the world market.

Rosatom will also expand its presence on the U.S. nuclear fuels market by offering fuel assemblies to U.S. utilities. In May 2016, Rosatom subsidiary TVEL announced a JV with General Electric (GE)/Global Nuclear Fuels Americas to manufacture Russian-designed fuel assemblies for U.S.-designed pressurized water reactors (PWRs) at GE's plant in Wilmington, North Carolina.[25]

TVEL has a particular business interest in selling Russian-designed fuel assemblies to U.S. nuclear power generators. Although any TVEL-designed

[23] Office of the United States Trade Representative, "2017 National Trade Estimate Report on Foreign Trade Barriers", (2017), https://ustr.gov/sites/default/files/files/reports/2017/NTE/2017%20NTE.pdf, 378; "2016 National Trade Estimate Report on Foreign Trade Barriers", (2016), https://ustr.gov/sites/default/files/2016-NTE-Report-FINAL.pdf, 374.

[24] U.S. International Trade Commission, "Uranium from Russia – Investigation No. 731-TA-539-C", 1.

[25] "Global Nuclear Fuel and TVEL Sign Agreement to Fuel U.S. Pressurized Water Reactors", *GE* Newsroom, (May 24, 2016), https://www.genewsroom.com/press-releases/global-nuclear-fuel-and-tvel-sign-agreement-fuel-us-pressurized-water-reactors-282966

assemblies for PWRs would be manufactured in the United States and considered as United States material under nuclear safeguards, the underlying technology and design is Russian. In theory, this would allow a U.S. utility to purchase the entirety of its fuel cycle needs- uranium ore, conversion services, enrichment, and fuel fabrication- from Russia, import it to the United States, and then assemble the Russian-designed fuel assembly in the United States to avoid duties on finished fuel assemblies. This poses a significant risk not simply to free-market producers who are not state subsidized, but also to broader U.S. nuclear security. Kazakhstan

Since the International Trade Administration lifted restrictions on the importation of Kazakh uranium in 1999, Kazakhstan's share of the U.S. uranium market has steadily increased.

[redacted][26]

Most uranium production in Kazakhstan is controlled by SOE Kazatomprom.[27] Kazatomprom wholly owns five mines and it owns a controlling

[26] [redacted]

[27] Although Kazatomprom maintains that it is a not an SOE, Kazatomprom is principally owned by the Samruk-Kazyna sovereign wealth fund. This fund is, in turn, owned exclusively by the Republic of Kazakhstan. World

interest in another 12 through JVs with foreign companies.[28] These JVs include agreements with Russia's Uranium One and ARMZ, Canada's Cameco, France's Areva, China's China National Nuclear Corporation, Japan's Sumitomo, and others. Foreign interest in Kazakh uranium stems in part from the country's sheer share of global production. Kazakh production of uranium increased 487 percent from 3,712 metric tonnes of uranium in 2004 to 21,800 in 2017.[29] Kazakhstan also increased its overall share of the world uranium market from 28 percent in 2014 to 39% in 2015 and 2016.[30]

State support and favorable geologic conditions underpin Kazakhstan's success on the global uranium market. While market producers have cut expenditures on exploration and development, Kazatomprom has instead increased spending. As Vladimir Shkolnik, Kazatomprom Chairman, explained: "For each ton of mined uranium, we will add at least 2 to 3 tons to our proven resources."[31]

Nuclear Association, "Uranium and Nuclear Power in Kazakhstan", (February 2019), http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/kazakhstan.aspx

[28] Global Business Reports, "Mining in Kazakhstan: Key Minerals, Companies, and Projects", *Engineering and Mining Journal* (September 2015), https://search.proquest.com/abicomplete/docview/1720425097/fulltextPDF/, 80.

[29] World Nuclear Association, "Uranium and Nuclear Power in Kazakhstan"

[30] Ibid.

[31] Vladislav Vorotnikov, "Taking it to the Next Level", *Engineering and Mining Journal* (August 2014), https://search.proquest.com/business/docview/1553540727/fulltextPDF/, 66.

Geologic factors have also promoted global interest in Kazakh deposits. The uranium ore contained in the Chu-Syrdara region, home to most of the country's deposits, has a low carbonate content as well as favorable ore body thickness; making in-situ recovery (ISR) methods both cheap and productive.[32]

Kazakhstan's government has adopted several active policy measures to spur Kazatomprom's success. Volkovgeology JSC, another SOE integrated into the Kazatomprom family, provides the company with low cost geological surveying and exploration services. The Kazakh government also heavily invests in job-related training for Kazatomprom employees, and has also assisted the company in building hospitals and sanitary units near the mines. Additionally, the Kazakh government pursued devaluations of the tenge in 2014 and 2015. These devaluations, which took place alongside similar devaluations of the Russian ruble and the Chinese yuan, helped lower the price of Kazakh uranium exports and increased local profits.[33]

Kazatomprom also benefits from comparatively lower environmental and labor standards compared to free-market producers. Although Kazakhstan has

[32] G.V. Fyodorov, "Uranium production and the environment in Kazakhstan", *International Atomic Energy Agency https*://pdfs.semanticscholar.org/1018/15c7962ca71348871fdb144939da33d7f1c8.pdf, 196.

[33] Henry Lazenby, "As Kazakh market discipline points to price trough, uranium developers focus on lower costs", *Creamer Media's Mining Weekly* (January 13, 2017), http://www miningweekly.com/article/as-kazakh-market-discipline-points-to-price-trough-developers-focus-on-lower-costs-2017-01-13/rep_id:3650

detailed laws pertaining to environmental remediation and insurance against possible contamination, these are generally poorly enforced.[34] Safety standards in Kazakhstan also generally lag behind those in developed countries. Indeed, most industrial safety initiatives are taken at the behest of privately-owned foreign companies; the Kazakh government has done little to mandate or implement new standards.

Kazakh Cooperation with Russia and China

Although Kazatomprom maintains that it is a publicly traded company and not subject to political pressures, many of the company's business decisions reflect Kazakhstan's political, economic, and military ties to Russia. Russian and Kazakh energy markets are heavily integrated. Russian exports account for nearly half of all of Kazakhstan's electricity; in return, Kazakhstan exports nearly 100 percent of its natural gas to Russia.[35] Uranium is no exception to this integrated market; Russia is the primary destination of Kazakh uranium exports.[36] Furthermore, even if the ultimate destination is outside of Russia, all Kazakh uranium exports are exported through Russia.

[34] Global Business Reports, "Kazakhstan's mining industry: Steppe by Steppe", (September 2015), https://www.gbreports.com/wp-content/uploads/2015/09/Kazakhstan_Mining2015.pdf, 78.

[35] Igbal A. Guliyev, Elnur T. Mekhdiev, "The Role of Fuel and Energy Sector in the Eurasian Economic Community Integration Process", *International Journal of Energy Economics and Policym* (2017), https://search.proquest.com/abicomplete/docview/1895146899/fulltextPDF/3C09DCBB7BAC4A3EPQ/9?accountid=37012, 73.

[36] Ibid., 74.

China is also a burgeoning partner for the Kazakh uranium industry. China General Nuclear Power Corporation (CGN) has entered into several agreements with the company to explore and develop new uranium deposits within Kazakhstan. In October 2017, the Kazakh Ministry of Energy announced an agreement between CGN and Kazatomprom to build a fuel fabrication facility in Kazakhstan. Once complete in 2019, this facility will produce more than 200 tons of fuel assemblies per year for CGN.[37] Such agreements with Chinese companies will integrate Kazakhstan into China's nuclear supply chain.

Kazakhstan's longstanding nuclear cooperation with both Russia and China makes U.S. reliance on Kazakh imports problematic. As Kazakhstan develops its own enrichment and fuel fabrication capacity, it is likely that these subsidized products will put further pressure on U.S. market producers just as artificially low-cost uranium concentrate exports do currently. Furthermore, given Russia and China's separate ambitions for dominance in the nuclear sphere, it follows that their increased presence in Kazakhstan could raise questions about U.S. utilities' future access to Kazakh uranium.

[37] Dmitry Bokarev, "Uranium Brings Together Kazakhstan and China", *New Eastern Outlook* (January 2, 2018), https://journal-neo.org/2018/01/02/uranium-brings-together-kazakhstan-and-china/

China

Unlike Kazakhstan and Russia, China is not yet a significant producer of uranium. Chinese uranium production in 2017 was an estimated 1,885 metric tonnes, less than half of total Russian production and just 8 percent of Kazakhstan's.[38] Nevertheless, China is embarking on an aggressive strategy to develop its nuclear industry and developing Chinese-controlled nuclear supplies. Through its SOE China National Nuclear Corporation (CNNC), China has opened two new domestic mines since 2007 and is exploring other deposits within the country. Chinese government estimates in 2016 suggest that there are 366,000 metric tonnes of uranium in recoverable deposits across the country, most of which have yet to be developed.

But increased domestic production will not be able to completely satisfy the country's growing nuclear fuel needs. The 13th Five-Year Plan envisions a total nuclear generation capacity of 58 gigawatts by 2020.[39] To support this goal, China has begun construction of 13 new reactors and has another 43 slated to begin construction within the next five years.[40] Approximately six to eight reactors will

[38] World Nuclear Association, "World Uranium Mining Production", (March 2019), http://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

[39] World Nuclear Association, "Nuclear Power in China", (March 2019), http://world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-power.aspx

[40] Ibid.

be commissioned each year through 2020, increasing to ten per year thereafter. These new reactors will increase China's fuel needs to a projected 11,000 metric tonnes of uranium per year by 2020 and 24,000 metric tonnes by 2030.

As domestic production alone will not be able to sustain these mines, China has adopted an official policy of "one-thirds" for its uranium acquisition. One-third will be produced domestically, one-third purchased on the open market, and the final third purchased through Chinese equity in foreign mines.[41] This final third represents a concrete threat to the viability of U.S. and other free-market uranium producers. Through CGN's subsidiary China Guangdong Nuclear Uranium Resources Co Ltd (CGN-URC) and CNNC's subsidiary China National Uranium Corporation Limited (CNUC), China has acquired an active stake in many foreign uranium mines. CGN-URC owns 90 pecent of the Huasab mine in Namibia, and also has significant shares at mines in Kazakhstan, Uzbekistan, and Canada. SinoU also has mining interests in Kazakhstan, Niger, and Namibia. In January 2019, CNNC also announced a joint venture with Shenghe Resources Holding Company Limited to exploit rare earth deposits in Greenland;

[41] World Nuclear Association, "China's Nuclear Fuel Cycle", (January 2019), http://world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-fuel-cycle.aspx

these deposits are estimated to contain nearly 20,000 metric tonnes of uranium.[42] Together, these mines dramatically increase the production capabilities of Chinese SOEs, and will allow them to produce from them without reference to price considerations at the detriment of free market producers.

China also intends to become self-sufficient in fuel fabrication and production. Although current Chinese fuel fabrication capacity consists of technologies transferred from Western firms as well as Russia, CNNC's long term goal is to develop domestic fuel technologies. To that end, CNNC announced the opening of a new research and development center in November 2018 that will "organize the overall planning for scientific innovations in the area of nuclear fuels and materials".[43] As China develops indigenous fuel designs in the future, it can be expected that that CNNC will move to compete on the global nuclear fuels market in a similar vein to Rosatom.

Although domestic needs are the main driver behind expansion of Chinese fuel cycle capabilities, CNNC intends to use surplus capacity to become a major player on the enriched uranium market. As a senior CNNC manager explained in

[42] World Nuclear Association, "New Chinese JV for rare earth minerals from Greenland", *World Nuclear News,* (January 23, 2019), http://www.world-nuclear-news.org/Articles/New-Chinese-JV-for-rare-earth-minerals-from

[43] World Nuclear Association, "CNNC launches R&D centre for fuels and materials", *World Nuclear News* (December 3, 2018), http://www.world-nuclear-news.org/Articles/CNNC-launches-R-D-centre-for-fuels-and-materials

June 2013, "On the basis of securing its domestic supply [of separative work units (SWU)], CNNC will gradually expand its foreign markets, and make China's nuclear fuel industry internationally competitive."[44] Even with its current enrichment capacity, China exported up to an estimated 1 million SWU in 2014.[45] As China's enrichment capacity increases, it can reasonably expected that its exports of enriched uranium and other uranium products will increase.

Between 2014 and 2018, U.S. utilities purchased approximately 2.6 million pounds U3O8 equivalent of uranium concentrate and uranium hexafluoride.

[redacted][46]

Increased Chinese enrichment capacity, combined with extensive government support, will further pressure free-market uranium producers and incentivize U.S. utilities to purchase Chinese uranium products. U.S. utilities have expressed broadly positive attitudes about China's entry into the nuclear fuels

[44] Hui Zhang, "China's Uranium Enrichment Capacity: Rapid Expansion to Meet Commercial Needs", *Belfer Center for Science and International Affairs*, https://www.belfercenter.org/sites/default/files /legacy/files/chinasuraniumenrichmentcapacity.pdf, 10.

[45] World Nuclear Association, "China's Nuclear Fuel Cycle"

[46] [redacted]

market, believing that it will make "small but helpful" contributions to global supply and add another source of production.

New enrichment capacity will offer China the opportunity to market fuels to Chinese-designed reactors being built in several countries. China has launched a major global marketing campaign promoting its French technology-derived Hualong One reactor as a cost-competitive option for countries looking to expand their nuclear power capacity.[47] CGN and CNNC have signed agreements with Pakistan[48] and Argentina[49] for construction of Hualong One reactors, and are currently looking to certify the design for use in the United Kingdom.[50] In January 2019, CGN reaffirmed its intent to deploy a UK-licensed Hualong One at the future Bradwell B nuclear plant in the United Kingdom.[51] Separately, CGN in 2015 concluded a joint venture with Romanian state operator Nuclearelectrica to

[47] World Nuclear Association, "Chinese firms join forces to market Hualong One abroad", *World Nuclear News* (December 31, 2015) http://www.world-nuclear-news.org/C-Chinese-fir ms-join-forces-to-market-Hualong-One-abroad-31121502.html

[48] Zafar Bhutta, "Govt to kick off work on 1,100 MW nuclear power plant", *The Express Tribune* (June 7, 2013), https://tribune.com.pk/story/559885/govt-to-kick-off-work-on-1100mw-nuclear-power-plant/

[49] World Nuclear Association, "Argentina and China sign contract for two reactors", *World Nuclear News* (May 18, 2017), http://www.world-nuclear-news.org/Articles/Argentina-and-China-sign-contract-for-two-reactors

[50] World Nuclear Association, "UK HPR1000 moves to next design stage assessment", *World Nuclear News* (November 15, 2018) http://www.world-nuclear-news.org/Articles/UK-HPR1000-moves-to-next-step-of-design-assessment

[51] Susann Twidale, "China to help plug UK nuclear power gap as Japanese plans falter", *Reuters,* (January 17, 2019), https://www reuters.com/article/us-hitachi-nuclear-china/china-to-help-plug-uk-nuclear-power-gap-as-japanese-plans-falter-idUSKCN1PB1GY

build two Canadian-designed reactors at the Cernavoda plant.[52] Chinese firms have also signed memoranda of understanding with Uganda and Kenya to explore potential nuclear deployments in the future.

Uzbekistan

Although a smaller producer than Russia, Kazakhstan, or China; Uzbekistan is another example of where an SOE can expand operations despite unfavorable market conditions. All uranium mining in Uzbekistan is conducted by by Navoi, itself wholly owned by the Uzbek SOE Kyzylkumredmetzoloto.

As of 2016, Navoi's mines produced approximately 2,405 metric tonnes of uranium, making Uzbekistan the world's fifth largest producer.[53]

With potential resources as high as 185,000 metric tonnes, the Uzbek government has made further development of these deposits a top priority.[54] In 2013 alone, Navoi spent $125 million on six new mines, meant to support Navoi's goal of exporting 4,200 metric tonnes per year by 2030.[55]

[52] World Nuclear Association, "UK HPR1000 moves to next design stage assessment"

[53] World Nuclear Association, "Uranium in Uzbekistan", (December 2018), http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/uzbekistan.aspx

[54] Ibid.

[55] Paul Moore, "Uzbekistan already fifth uranium producer with expansion of in-situ leaching", *International Mining* (May 10, 2016), https://im-mining.com/2016/05/10/uzbekistan-already-fifth-uranium-producer-with-expansion-of-in-situ-leaching/

As Uzbekistan has no domestic nuclear generation capacity, all Uzbek production is intended for the export market. The primary customers of Uzbek uranium are the United States, Russia, South Korea, Japan, and, most recently, China. While a depressed market and difficult extraction has dissuaded investment by many free-market producers, high costs and low prices have not deterred Chinese interest. In August 2009, CGN-URC partnered with Uzbek SOE Goskomgeo to create the JV Sino-Uz Uranium Resources Co. Ltd. This JV was to be given rights to develop black shale uranium deposits in the Central Kyzylkum desert, where there are an estimated 5,500 metric tonnes of recoverable uranium. Under the terms of the JV, CGN-URC will have primary purchase rights over the uranium produced from these deposits.[56] CGN-URC has committed to develop mining technology specific to uranium recovery from black shale, and as of 2014, work was still in progress.

Uzbekistan has also deepened existing ties with Russia. In December 2017, Uzbekistan signed an agreement with Rosatom for the construction of the

[56] Hui Zhang and Yunsheng Bai, "China's Access to Uranium Resources", *Belfer Center for Science and International Affairs*, https://www.belfercenter.org/sites/default/files/files/publication/chinasaccesstouraniumresources.pdf, 39.

country's first commercial nuclear plant and several research reactors.[57] This involvement in the Uzbek uranium industry is of concern for U.S. interests. Due to increased geopolitical tensions with Russia, many U.S. utilities have looked to Uzbekistan as an alternative source for uranium. In September 2017, Uzbek Minister of Foreign Trade Eleira Ganiev announced a $300 million contract to supply U.S. utilities with uranium concentrate via the broker Nukem.[58] This contract continues a trend of consistent U.S. imports from Uzbekistan. Between 2014 and 2018, U.S. utilities purchased approximately 5.5 percent of their uranium concentrate from Uzbekistan.[59]

Uzbekistan's increasing diplomatic and military ties with Russia also raise concerns about the independence of the Uzbek nuclear industry. Following President Shavkat Mirziyoyev's election in 2016, Uzbekistan has indicated an interest in increasing defense ties with Russia. In October 2017, Russia and

[57] Dmitry Bokarev, "Nuclear Power is a New Sphere of Cooperation between Russia and Uzbekistan", *New Eastern Outlook* (July 6, 2018), https://journal-neo.org/2018/07/06/nuclear-power-is-a-new-sphere-of-cooperation-between-russia-and-uzbekistan/

[58] Polina Trifonova and Alexey Nikolsky, "U.S. will buy uranium in Uzbekistan for seven years", *Vedomosti* (September 29, 2017), https://www.vedomosti ru/business/articles/2017/09/29/735853-ssha-uran-uzbekistane#galleries%2F140737493571633%2Fnormal%2F1

[59] U.S. Department of Commerce, Bureau of Industry and Security, Nuclear Power Generation Survey, Q9

Uzbekistan held their first joint military exercises since 2005.[60] Uzbekistan may also be considering rejoining the Russian-led Collective Security Treaty Organization, of which it had been a member of between 2006 and 2012.[61] Given these deepening relations, it is uncertain that Uzbekistan will remain a reliable, neutral supplier for U.S. utilities.

[60] "Russia, Uzbekistan team up for military drills at Uzbek Forish ground", *TASS Russian News Agency* (October 3, 2017), http://tass.com/defense/968574

[61] Samuel Ramani, "Russia and Uzbekistan's Renewed Security Partnership", *The Diplomat*, (July 11, 2017), https://thediplomat.com/2017/07/russia-and-uzbekistans-renewed-security-partnership/

Appendix J

Appendix J: U.S. Naval and Nuclear Weapons Uses of Uranium

Defense Requirements for U.S.-Origin Uranium-Based Products			
Submarines – HEU Fuel (Total = 70)		**Nuclear-Powered Aircraft Carriers – HEU Fuel** (Total = 11)	**HEU/Tritium - Nuclear Weapons**
USS Seawolf (SSN 21)	USS Scranton (SSN 756)	USS Nimitz (CVN 68)	3,800 +/- *
USS Connecticut (SSN 22)	USS Alexandria (SSN 757)	USS Dwight D. Eisenhower (CVN 69)	
USS Jimmy Carter (SSN 23)	USS Asheville (SSN 758)	USS Carl Vinson (CVN 70)	
USS Buffalo (SSN 715)	USS Jefferson City (SSN 759)	USS Theodore Roosevelt (CVN 71)	
USS Olympia (SSN 717)	USS Annapolis (SSN 760)	USS Abraham Lincoln (CVN 72)	
USS Providence (SSN 719)	USS Springfield (SSN 761)	USS George Washington (CVN 73)	
USS Pittsburgh (SSN 720)	USS Columbus (SSN 762)	USS John C. Stennis (CVN 74)	
USS Chicago (SSN 721)	USS Santa Fe (SSN 763)	USS Harry S. Truman (CVN 75)	
USS Key West (SSN 722)	USS Boise (SSN 764)	USS Ronald Reagan (CVN 76)	
USS Oklahoma City (SSN 723)	USS Montpelier (SSN 765)	USS George H.W. Bush (CVN 77)	
USS Louisville (SSN 724)	USS Charlotte (SSN 766)	USS Gerald R. Ford (CVN 78)	
USS Helena (SSN 725)	USS Hampton (SSN 767)		
USS Ohio (SSGN 726)	USS Hartford (SSN 768)		
USS Michigan (SSGN 727)	USS Toledo (SSN 769)		
USS Florida (SSGN 728)	USS Tucson (SSN 770)		
USS Georgia (SSGN 729)	USS Columbia (SSN 771)		
USS Henry M. Jackson (SSBN 730)	USS Greeneville (SSN 772)		
USS Alabama (SSBN 731)	USS Cheyenne (SSN 773)		
USS Alaska (SSBN 732)	USS Virginia (SSN 774)		
USS Nevada (SSBN 733)	USS Texas (SSN 775)		
USS Tennessee (SSBN 734)	USS Hawaii (SSN 776)		
USS Pennsylvania (SSBN 735)	USS North Carolina (SSN 777)		
USS West Virginia (SSBN 736)	USS New Hamp. (SSN 778)		
USS Kentucky (SSBN 737)	USS New Mexico (SSN 779)		
USS Maryland (SSBN 738)	USS Missouri (SSN 780)		
USS Nebraska (SSBN 739)	USS California (SSN 781)		
USS Rhode Island (SSBN 740)	USS Mississippi (SSN 782)		
USS Maine (SSBN 741)	USS Minnesota (SSN 783)		
USS Wyoming (SSBN 742)	USS North Dakota (SSN 784)		
USS Louisiana (SSBN 743)	USS John Warner (SSN 785)		
USS Newport News (SSN 750)	USS Illinois (SSN 786)		
USS San Juan (SSN 751)	Washington (SSN 787)		
USS Pasadena (SSN 752)	Colorado (SSN 788)		
USS Albany (SSN 753)	USS Indiana (SSN 789)		
USS Topeka (SSN 754)	South Dakota (SSN 790)		

*Includes 1,700 warhead on missiles and strategic bombers; 2,100 warheads in reserve; 150 war heads in Europe. An additional 2,500 warheads are slated for dismantlement.

Sources: U.S. Navy, International Panel on Fissile Materials (www.fissilematerials.org)

Appendix K

Glossary - 1	
Base load:	That part of electricity demand which is continuous, and does not vary over a 24-hour period. Approximately equivalent to the minimum daily load.
Boiling Water Reactor (BWR):	A common type of light water reactor (LWR), where water is allowed to boil in the core thus generating steam directly in the reactor vessel. (cf PWR)
Conversion:	Chemical process turning U3O8 into UF6 preparatory to enrichment
Deconversion:	The chemical process of turning UF6 into uranium oxide. Typically depleted UF6 may be processed for long-term storage in a more stable chemical form. HF is a by-product
Depleted Uranium:	Uranium having less than the natural 0.7% U-235. As a by-product of enrichment in the fuel cycle it generally has 0.25-0.30% U-235, the rest being U-238. Can be blended with highly-enriched uranium (e.g. from weapons) to make reactor fuel.
Enrichment:	Physical process of increasing the proportion of U-235 to U-238.
Enriched uranium:	Uranium in which the proportion of U-235 (to U-238) has been increased above the natural 0.7%. Reactor-grade uranium is usually enriched to about 3.5% U-235, weapons-grade uranium is more than 90% U-235.
Enriched Uranium Product (EUP)	Uranium in which the percent composition of uranium-235 has been increased through the process of isotope separation. Natural uranium is 99.284% U-238 with U-235 only constituting about 0.711% of its mass.
Fuel Assembly:	Structured collection of fuel rods or elements, the unit of fuel in a reactor.
Fuel Fabrication:	Making reactor fuel assemblies, usually from sintered UO2 pellets which are inserted into zircalloy tubes, comprising the fuel rods or elements.
Half-life:	The period required for half of the atoms of a particular radioactive isotope to decay and become an isotope of another element
High Assay Low-Enriched Uranium	Fuel for these reactors may be enriched to levels approaching 20 percent U-235 content.
High-Enriched Uranium (HEU):	Uranium enriched to 20% U-235 or more. (That in weapons is about 90% U-235.)
Isotope:	An atomic form of an element having a particular number of neutrons. Different isotopes of an element have the same number of protons but different numbers of neutrons and hence different atomic masses, e.g. U-235, U-238. Some isotopes are unstable and decay (qv) to form isotopes of other elements.
Light Water Reactor (LWR):	A common nuclear reactor cooled and usually moderated by ordinary water. It is s generic designation including BWR and PWR types.
Low-Enriched Uranium (LEU):	Uranium enriched to less than 20% U-235. (That in power reactors is usually 3.5 - 5.0% U-235.)
Megawatt (MW):	A unit of power, one million or 106 watts. MWe refers to electric output from a generator, MWt to thermal output from a reactor or heat source (e.g. the gross heat output of a reactor itself, typically around three times the MWe figure).
Milling:	Process by which minerals are extracted from ore, usually at the mine site, to produce a mineral concentrate for sale, e.g. U3O8.
	Continued Next Page

Glossary - 2	
Natural Uranium:	Uranium with an isotopic composition as found in nature, containing 99.3% U-238, 0.7% U-235 and a trace of U-234. It can be used as fuel in heavy water-moderated or graphite-moderated reactors.
Neutron:	An uncharged elementary particle found in the nucleus of every atom except hydrogen. Solitary mobile neutrons travelling at various speeds originate from fission reactions. Slow (thermal) neutrons can in turn readily cause fission in nuclei of "fissile" isotopes, e.g. U-235, Pu-239, U-233; and fast neutrons can cause fission in nuclei of "fertile" isotopes such as U-238, Pu-239. Sometimes atomic nuclei simply capture neutrons.
Nuclear Reactor:	A device in which a nuclear fission chain reaction occurs under controlled conditions so that the heat yield can be harnessed or the neutron beams utilized. All commercial reactors are thermal reactors, using a moderator to slow down the neutrons.
Plutonium:	A transuranic element, formed in a nuclear reactor by neutron capture. It has several isotopes, some of which are fissile and some of which undergo spontaneous fission, releasing neutrons. Weapons-grade plutonium is produced in special reactors to give >90% Pu-239, reactor-grade plutonium contains about 30% non-fissile isotopes. About one third of the energy in a light water reactor comes from the fission of Pu-239, and this is the main isotope of value recovered from reprocessing used fuel.
Pressurized Water Reactor (PWR):	The most common type of light water reactor (LWR), it uses water at very high pressure in a primary circuit and steam is formed in a secondary circuit.
Reprocessing:	Chemical treatment of used reactor fuel to separate uranium and plutonium and possibly transuranic elements from the small quantity of fission products, leaving a much reduced quantity of high-level waste.
Separative Work Unit (SWU):	This is a complex unit which is a function of the amount of uranium processed and the degree to which it is enriched, i.e. the extent of increase in the concentration of the U-235 isotope relative to the remainder. The unit is strictly: Kilogram Separative Work Unit, and it measures the quantity of separative work (indicative of energy used in enrichment) when feed and product quantities are expressed in kilograms. e.g., to produce one kilogram of uranium enriched to 3.5% U-235 requires 4.3 SWU if the plant is operated at a tails assay 0.30%, or 4.8 SWU if the tails assay is 0.25% (thereby requiring only 7.0 kg instead of 7.8 kg of natural U feed). About 100-120,000 SWU is required to enrich the annual fuel loading for a typical 1000 MWe light water reactor. Enrichment costs are related to electrical energy used. The gaseous diffusion process consumes some 2400 kWh per SWU, while gas centrifuge plants require only about 60 kWh/SWU.
Stable:	Incapable of spontaneous radioactive decay.
Uranium (U):	A mildly radioactive element with two isotopes which are fissile (U-235 and U-233) and two which are fertile (U-238 and U-234). Uranium is the basic fuel of nuclear energy.
	Continued Next Page

Glossary - 3	
Uranium Hexafluoride (UF6):	A compound of uranium which is a gas above 56°C and is thus a suitable form in which to enrich the uranium. Uranium concentrate (yellow cake) that has been reacted with fluorine, hydrofluoric acid, hydrogen and uranyl fluoride to form material suitable for enrichment.
Uranium Concentrate (Triuranium Octoxide)	Partially processed uranium that is a form of "yellow cake." It is stable and can be shipped between uranium milling facilities and refineries. Used primarily for power reactor fuel, this material is largely supplied by foreign producers. The mixture of uranium oxides produced after milling uranium ore from a mine. Uranium is normally sold in this form.
Uranium Oxide	Produced by converting depleted uranium in the form of UF6 into uranium oxide, a stable material.
Uranium Dioxide (UO2)	A powder product formed by chemically processing hexafluoride (UF6) for manufacturing pellets for fuel rods used in reactor fuel assemblies.
Uranium-235	An isotope of uranium with 0.72% of natural uranium content. It can enable a fission chain reaction.
Uranium-238	The most common isotope of uranium found occurring in nature. It can be transformed into fissionable plutonium in a nuclear reactor.
Uranium-239	An isotope formed from irradiated U238 in a reactor; the precursor to Pu-238.
Plutonium-238	A radioactive isotope of plutonium that has a half-life of 87.7 years
Plutonium-239	Pu-239 is created in nuclear reactors by transmutation of individual atoms of an isotopes of uranium present in the fuel rods.
Yellowcake:	Ammonium diuranate, the penultimate uranium compound in U3O8 production, but the form in which mine product was sold until about 1970.
Sources: U.S. Department of Energy, Energy Information Administration, World Nuclear Association	