Nuclear Innovation Alliance Response to U.S. Department of Energy Request for Information on Reducing Regulation and Controlling Regulatory Costs

July 14, 2017

The Nuclear Innovation Alliance (NIA) appreciates the opportunity to comment on the Department of Energy's regulations and where they could be improved. NIA's mission is to lead advanced nuclear energy innovation. The NIA assembles companies, investors, experts, and stakeholders to advance nuclear energy innovation and enable innovative reactor commercialization through favorable energy policy and funding. The NIA researches, develops and advocates policies that enable the efficient licensing and timely early-stage demonstration of advanced reactor technologies.

The International Energy Agency (IEA)[1] and U.S. Energy Information Administration (EIA)[2] project that countries outside of the United States are expected to deploy hundreds of gigawatts of new nuclear power capacity over the next three decades in order to meet energy demands while at the same time avoiding air pollution and greenhouse gas emissions. Both EIA and IEA project essentially no growth for total nuclear energy capacity in OECD countries, such as the United States.

For that reason, NIA views export control reform as essential to promoting nuclear innovation by providing efficient access to emerging markets for nuclear power consistent with U.S. nonproliferation practices. NIA is currently working on a report that examines DOE's export controls for nuclear technology and assistance. Much of the underlying legislation for current U.S. nuclear energy export controls was put in place during the 1950s and 1970s, when the United States occupied a much more dominant position in the global marketplace than it does today. While the U.S. largely stopped ordering and building new nuclear reactors in the 1980s and 1990s, several other supplier nations (e.g., Russia, China, and Korea) have been successfully building reactors in the intervening years. Those nations are the ones winning the contracts today to build nuclear power plants in countries such as the UAE.

[1] https://www.iea.org/publications/freepublications/publication/technology-roadmap-nuclear-energy-2015-.html
[2] U.S. EIA International Energy Outlook 2016.

In the past 25 years, the Nuclear Suppliers Group[3] (NSG) has set higher international nonproliferation standards for the supply of nuclear material, equipment, and technology. In 1992, the NSG adopted a policy that required non-nuclear weapon states to have International Atomic Energy Agency (IAEA) safeguards on all of their source and special fissionable materials as a condition of supply for Trigger List items[4] (otherwise known as "full-scope safeguards"). In 1995, the NSG made the technology associated with all Trigger List items subject to the same guidelines that govern the export of materials and equipment[5] (these changes in 1995 are the most relevant for the 10 CFR Part 810 regulations discussed below). In 2011, the NSG set very stringent nonproliferation conditions[6] for the transfer for enrichment, reprocessing and heavy water facilities and technologies.

As the major suppliers of nuclear reactors (e.g., Russia, France, Japan, Korea, and China[7]) are all members of the NSG, they have the same supplier obligations as the United States. The rules for supplying nuclear reactor technology make it relatively clear what conditions will qualify countries for the transfer of nuclear reactor technology. For example, when the UAE released a policy statement in 2008 regarding its plans for a nuclear power program[8], it had already acceded to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in 1995 and had a comprehensive safeguards agreement with the IAEA in place since 2003. In the same policy statement, the UAE announced its intention to adopt the IAEA's Additional Protocol which ultimately came into force in 2010. The UAE thus met the major condition in paragraph 4 (a) of the NSG Trigger List Guidelines for the supply of power reactor materials, equipment and technology, and had announced the intention to provide even more transparency into its nuclear program with an Additional Protocol. Following the 2008 policy statement, the UAE entertained power reactor bids from major suppliers, and ultimately selected the Republic of Korea to build four reactors (totaling 5.6 GWe) at a cost of $20B[9]. The UAE would evidently

[3] The NSG maintains two control lists with associated guidelines that govern their supply. For the Part 810 regulations, the Trigger List Guidelines (otherwise known as "Part One Guidelines") are the relevant ones, as they apply to technology associated with nuclear-specific items such as reactors, enrichment, reprocessing, fuel fabrication, and conversion. The guidelines can be found at: http://www.nuclearsuppliersgroup.org/en/guidelines

[4] Paragraph 4 (a) of the NSG Trigger List Guidelines

[5] The phrase "or related technology" was added in multiple places, but the most relevant additions were in paragraphs 2, 4, 9, and 10.

[6] Paragraphs 6 and 7 of the Trigger List Guidelines delineate the criteria that must be met for a country to qualify for the transfer of enrichment, reprocessing, and heavy water technology.

[7] These countries together have the full suite of nuclear technologies several times over: conversion, enrichment, fuel fabrication, reactors, and reprocessing. The United States does not have a monopoly in any area in the civil nuclear energy realm.

[8] http://www.uae-embassy.org/sites/default/files/UAE_Policy_Peaceful_Nuclear_Energy_English.pdf

[9] http://www.world-nuclear.org/information-library/country-profiles/countries-t-z/united-arab-emirates.aspx

have had access to reactor technology from multiple supplier nations outside of the United States, even if the United States itself had ultimately decided not to do business with the UAE.

The 10 CFR Part 810 Regulations

The Department of Energy regulates the export of U.S. nuclear technology and other assistance to foreign nuclear programs under the 10 CFR Part 810 regulations. DOE recently updated the 10 CFR Part 810 regulations in 2015[10], after a notice of public rulemaking in 2011[11] and a supplementary notice of public rulemaking in 2013[12]. As DOE noted in its Federal Register postings, the time taken by the U.S Government (USG) to process specific authorization applications under Part 810 has been a concern[13]. This was also reflected in industry comments during the rulemaking[14]. DOE indicated in the same Federal Register notices that it would initiate a process improvement plan to address this issue[15]. Congress requested a report on these process improvements to Part 810 in House Report 114-91.

To a large degree, activities regulated under Part 810 can be divided into two categories: those activities that are generally authorized (in other words, a U.S. company may only need to submit a report to DOE afterwards describing the activities that were undertaken) and those that require specific authorization from the Secretary of Energy. The transfer of power reactor

[10] 80 Federal Register 9359, Final Notice of Proposed Rulemaking (FNOPR).
[11] 76 Federal Register 55278, Notice of Proposed Rulemaking (NOPR).
[12] 78 Federal Register 46829, Supplemental Notice of Proposed Rulemaking (SNOPR) and Public Meetings.
[13] From the SNOPR: "The Department acknowledges commenters' concerns that the time frame for issuance of specific authorizations can impose business risks for companies seeking to make nuclear exports requiring specific authorization." From the FNOPR: "As noted in the SNOPR, many NOPR commenters were concerned that the part 810 specific authorization process is unduly protracted, and that processing delays put U.S. suppliers at a competitive disadvantage with companies in other countries."

[14] From 2011 NEI Comments on NOPR: "Currently, the DOE consumes anywhere from six months to well over one year to process a typical specific authorization. In some cases, application reviews have approached two years."

[15] From SNOPR: "DOE is initiating a process quality improvement program to make the processing of part 810 applications more orderly, expeditious, effective, and transparent." From FNOPR: "Anticipated improvements in the processing time of part 810 applications that may come from the PIP [process improvement program] include these recommended actions from commenters: …• Reduce application processing time—This effort will begin by DOE analyzing the authorization case database to determine causes of processing time variation and undue delay. The PIP team will conduct benchmark studies to identify best practices and methods to improve efficiency. The team will work with the DOS to find ways to request and secure foreign governments' nonproliferation assurances more promptly, and make internal DOE and interagency reviews of part 810 specific authorization applications more efficient by reducing unnecessary reviews and approvals."

technology, for example, is generally authorized to the countries listed in Appendix A of the Part 810 regulations. On the other hand, the transfer of power reactor technology to countries not listed in Appendix A requires specific authorization from the Secretary of Energy, as does the transfer of enrichment, reprocessing, and heavy water technology to any country (whether they are listed in Appendix A or not).

For activities that require specific authorization, the Secretary of Energy is required by Section 57b of the Atomic Energy Act of 1954, as amended (hereafter referred to as "the Atomic Energy Act"), to determine that a specific activity will not be inimical to the interests of the United States. DOE keeps a historical record of these secretarial determinations in its public reading room. While it does not include all secretarial determinations made over the past three decades, the records on file do illustrate the wide variety of activities that have been regulated under Part 810, as well as historical trends. For example, multiple U.S. companies received authorization to transfer light water reactor technology to the UAE as part of the reactor bid competition. U.S. companies also received authorization to hire foreign nationals from countries not listed in Appendix A, which are types of authorizations known as "deemed exports".

Paragraphs 2 and 9 of the NSG Trigger List Guidelines describe assurances that suppliers should obtain before transferring Trigger List items and – relevant to this report – "related technology" for Trigger List items. Accordingly, paragraph 2 of the NSG Trigger List Guidelines requires "formal government assurances from recipients explicitly excluding uses which would result in any nuclear explosive device" for transfers of technology associated with Trigger List items (for example, nuclear reactors). Likewise, paragraph 9 of the NSG Trigger List Guidelines describes the assurances that suppliers should obtain related to the retransfer of nuclear technology after it has been supplied to a recipient country. USG policy since the mid-1990s has been that when an application for specific authorization is received, the Department of State typically requests these two types of assurances from the relevant foreign government. The public records show that specific language used in secretarial determinations changed around 2005-2006. The phrasing in secretarial determinations previous to 2005 stated that they were "subject to U.S. Government receipt" of foreign government assurances. After 2006, however, secretarial determinations referred to assurances "already given" or "that were provided" to the USG.

The language implies a qualitative change to the nature of secretarial determinations: in the 1990s, even after a secretarial determination had been signed, a company might still have to wait for the assurances to be received before starting work. Today, companies can begin their work immediately after a determination is signed, as the assurances have already been delivered to the USG. Figure 1 depicts the implied change in how Part 810 applications are processed.

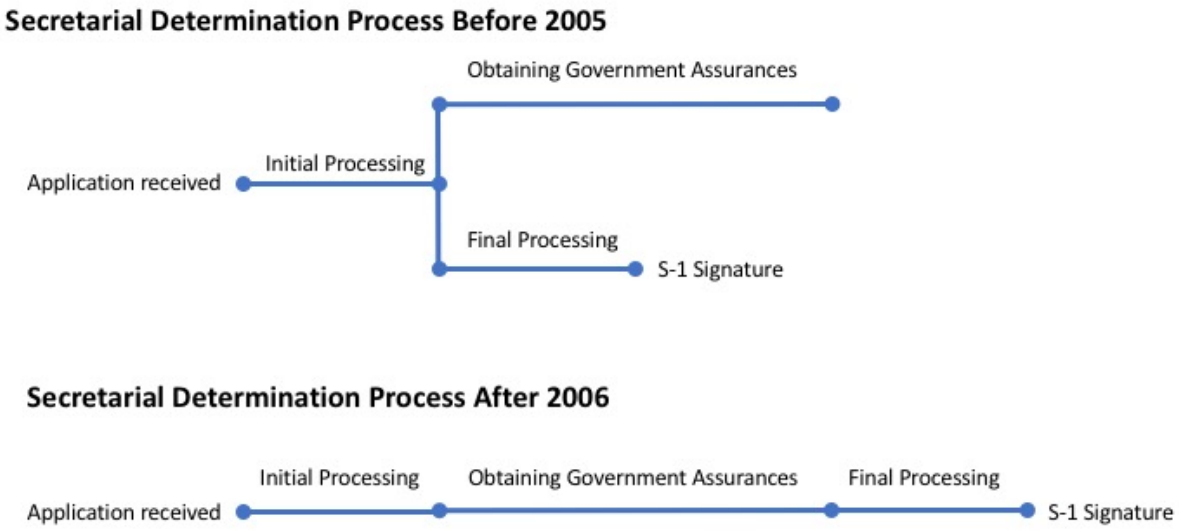

Figure 1 Depiction of Secretarial Determination process before 2005 and after 2006.

This change from a parallel processing structure to a serial one appears to be a contributing factor in the rise of processing times for specific authorization applications. Figure 2 shows the processing times for specific authorization applications from 1990-2014 averaged over five year periods. The processing times are defined to be the number of days between when an application is submitted and when the secretarial determination is signed. There is some ambiguity in this analysis, as some applications refer to amendments to applications, as well as resubmittals. For consistency, the earliest application date mentioned is used, though in some specific cases this will exaggerate the time taken for processing. In addition, for this analysis, each signature by the Secretary of Energy is counted as one determination, even if it involves multiple countries and multiple activities.

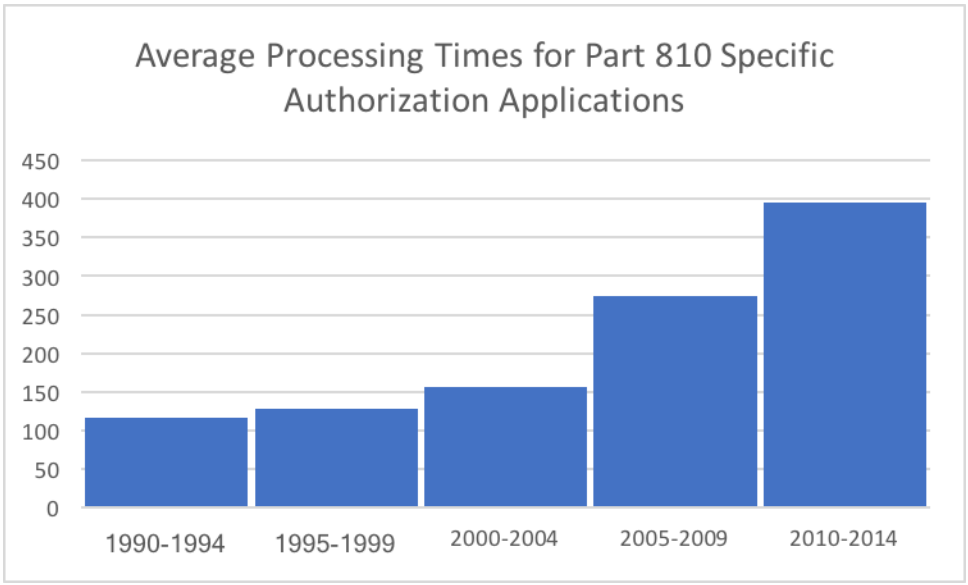

Figure 2 Average processing time for specific authorization applications. Data from DOE public reading room.

A second challenge for U.S. companies working within the Part 810 regulations is the uncertainty in how long the application process may take before the company knows whether the application has been approved or not. Figure 3 shows the variation in processing times for the years 2005-2014, albeit with limited statistical precision.

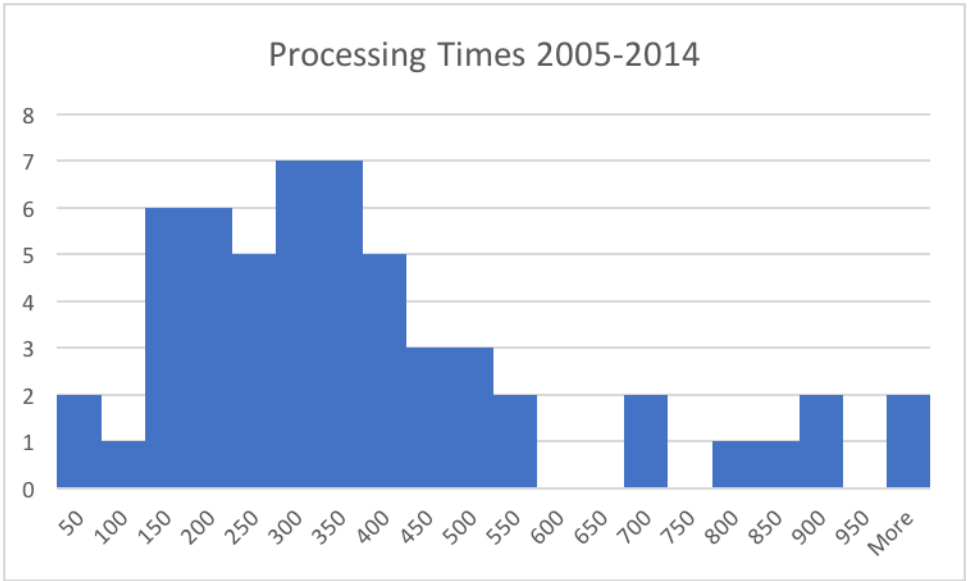

Figure 3 Processing times for specific authorization applications from 2005-2014. Data from DOE public reading room.

The 2014 GAO Report

GAO produced a report[16] in 2014 on the Part 810 process in response to a request from Congress. GAO described the Part 810 process as composed of three stages:

1) Initial review, with initial analysis and recommendations from DOE staff before the application and recommendations are sent to the interagency for review;
2) Interagency review, during which the State Department may obtain written nonproliferation assurances from host governments and then provide its concurrence or non-concurrence, while the Department of Commerce, the Nuclear Regulatory Commission, and Department of Defense provide consultations; and
3) Final review, during which the NNSA Office of Nonproliferation and Arms Control drafts authorization approval recommendation which is reviewed by NNSA staff, Office of General Counsel staff, and Office of Nuclear Energy staff before it goes to the Secretary of Energy's desk for signature.

GAO was provided with data from NNSA on time intervals for each processing period and produced the following figure to estimate how long each stage takes.

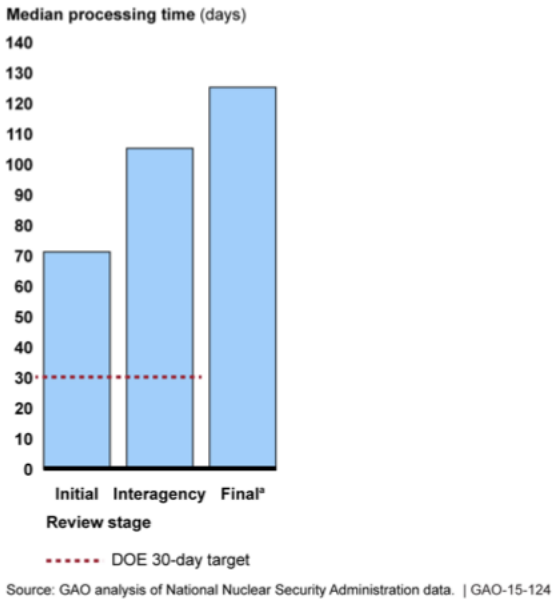

Figure 4 Median processing times per stage of specific authorization review. Figure from GAO, 2014.

As Figure 4 indicates, the Department of Energy takes around 70 days (GAO used medians for its estimates) for initial review, in addition to the roughly 100 days for interagency review and obtaining government to government assurances. After interagency review, the Department

[16] GAO, 2014. "Additional Actions Needed to Improve DOE's Export Control Process". Available at: http://www.gao.gov/assets/670/666494.pdf

of Energy takes another 120 days to approve the authorization. GAO further broke the specific authorization data into two categories – deemed exports and non-deemed exports – as shown in Figure 5.

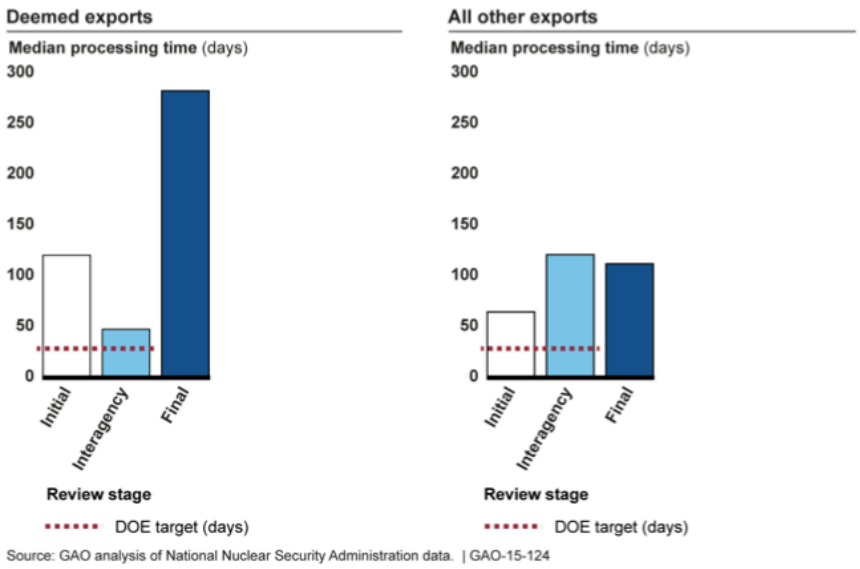

Figure 5 Deemed exports and other exports. Figure from GAO, 2014.

As deemed exports do not require the obtaining of government to government assurances, the interagency processing time for them is shorter than for other exports, as one would expect. Less clear is why the initial and final review times for deemed export applications are so much greater than for non-deemed export applications.

The GAO report noted that the State Department takes the longest to respond of the agencies involved. This is not surprisingly given that the State Department is the only agency providing concurrence or non-concurrence under the Atomic Energy Act and the only agency obtaining government to government assurances. GAO calculated that the State Department median review time was 86 days, and noted that the review time depended to some degree on foreign government's timeliness in providing assurances. One specific example cited in the report was a case of technology transfer to China in which the Chinese government took nearly 2 years to provide the requested assurances.

Recommendations

NIA recommends that DOE focus on 1) reducing the total amount of time taken to process applications for specific authorization under Part 810 and 2) reducing the uncertainty over application processing time. The overriding issue is not approving license applications that were previously rejected, but rather providing an answer to U.S. companies – yes or no – in a shorter and more predictable amount of time. Reducing processing times will mitigate the impact of the 10 CFR Part 810 regulations on U.S. reactor companies doing business in countries not listed in Appendix A.

The NSG Guidelines have already set high nonproliferation standards for the supply of nuclear technology that all major suppliers of nuclear technology have committed to. Countries that are beginning nuclear power programs or expanding existing ones have multiple supplier countries to do business with and do not need approval or assistance from the United States to have successful, growing enterprises. The growth in processing times for Part 810 specific authorizations is not serving any U.S. interests.

With that in mind, NIA has several recommendations for DOE to improve the efficiency of the Part 810 process.

Recommendation 1: *The Department of Energy should re-examine the legal interpretation of Section 161n of the Atomic Energy Act that is currently thought to prohibit delegation of authority by the Secretary of Energy for activities under Section 57b. If DOE determines that delegation is prohibited, it should request that Congress amend Section 161n of the Atomic Energy Act to recognize the very different global context today.*

Current practice at DOE is to require that the Secretary of Energy sign off on every part 810 specific authorization, no matter how minor, as well as every amendment and extension to existing authorizations. This adds weeks, if not months, to the processing of specific authorization applications with no obvious benefit. It is difficult to see why the Secretary of Energy's attention is needed or useful in any way for approving the hiring of foreign nationals, minor amendments to existing authorizations, renewals of authorizations, or other relatively technical or small-scale activities, such as operational consultations to existing light water reactors under IAEA safeguards.

In 1954, prohibiting delegation by the Atomic Energy Commission may have made sense: a determination to transfer nuclear technology from the United States could mean that a country might have a nuclear energy program much more quickly. But that was during a time when the United States was the predominant supplier of nuclear technology and an aspiring country had few alternatives for assistance, if any. Today, the United States has had a comparatively weak role in new nuclear builds over the past several decades, and other supplier countries are already in a better position to provide some of the services that are licensed under Part 810.

The long processing times for specific authorizations only serve to make it harder for U.S. companies to win competitive bids.

Recommendation 2: *DOE should issue a new rulemaking that establishes two fast track authorization pathways for less significant activities in a specified group of countries. The first fast track authorization should be for applications that do not require government to government assurances, such as deemed exports. The second fast track authorization pathway should be for activities that require government to government assurances, such as the transfer of a reactor design. In both cases, DOE should establish the types of activities that qualify for fast track approval and the list of countries that are eligible for consideration.*

The Part 810 regulations contain one list of countries that are generally authorized destinations (Appendix A). Other Federal regulations have multiple country lists. The NRC's 10 CFR Part 110 regulations, for example, have country lists for embargoed destinations (110.28) and restricted destinations (110.29), as well as the lists in 110.26 and 110.30 that allow for expedited approval of minor exports. The list in 110.30 is comprised of members of the Nuclear Suppliers Group, and Part 110 provides general licenses to export, for example, small amounts of plutonium-236 and plutonium-238 sources to those countries. The country list in 110.26 appears to have been determined based on the nonproliferation credentials of the countries listed, and provides general licenses for the export of minor reactor components for use in light and heavy water moderated reactors. There is no reason why the Part 810 regulations could not contain either type of list: restricted destinations and destinations for expedited approval.

The Part 810 regulations already have in place a type of fast track authorization for operational safety activities at 810.6c(2). This section provides authorization for furnishing "operation safety information or assistance to existing safeguarded civilian nuclear reactors outside the United States in countries with safeguards agreements with the IAEA or an equivalent voluntary offer, provided DOE is notified in writing and approves the activity in writing within 45 days of the notice". Given the type of activity (operation safety assistance to IAEA safeguarded reactors) and the type of destination (countries with safeguards agreements with the IAEA or an equivalent voluntary offer) the expectation is that a given application will be approved, though the process still affords the USG an opportunity to review and potentially reject the application.

The first fast track authorization pathway that NIA recommends be established is modeled on 810.6c(2) where the identified activities and destinations would not need government-to-government assurances. Following the model in 810.c(2), the new pathway would allow companies to notify DOE that they are intending to pursue specific activities and if they do not hear from DOE after a specified amount of time, e.g., 45 days, the activity is deemed to be approved. NIA proposes two types of activities as candidates for this fast track approval: deemed exports and consulting services for light water reactors and thermal spectrum gas-cooled reactors under IAEA safeguards with appropriate retransfer provisions. NIA further proposes the following criteria to consider in identifying fast track destination countries: Non-

nuclear weapon states (NNWS) under the NPT with Additional Protocols in place. In determining which countries should qualify for fast track approval, DOE should also consider previous indications of U.S. intent to cooperate with countries, in the form of prior and existing project supply agreements, prior nuclear cooperation agreements, prior Part 810 authorizations, memorandums of understanding for peaceful nuclear energy cooperation, and other federal government agency assessments (e.g., the country list in 10 CFR Part 110.26).

The second fast track authorization pathway should be for activities where country-to-country assurances are needed. For specific technologies (e.g., light water reactor and high temperature gas reactor technologies) DOE should establish an authorization pathway where applications are immediately sent to the State Department to begin the process of seeking assurances, again with the expectation of approval given the bounded set of activities and destinations. As in the first pathway, if objections by the USG are not raised within a set amount of time (e.g., 45 days) the activity is deemed to be approved upon receipt of the government to government assurances. The destination criteria should be similar to the country criteria described in the first fast track pathway above.

Recommendation 3: *For specific authorization applications under 810.7, DOE should go back to the pre-2005 formulation of signing determinations subject to the receipt of assurances. At a minimum, it should continue to process Part 810 packages while the interagency review process is ongoing and move them up to the Secretary's office while assurances are being sought by the State Department so that they are ready to be signed immediately afterwards. This will help to ensure the smallest amount of time between when the assurances are received and when the determination is signed, and reduce the time taken in the final review stage.*

As Figure 4 shows, there is a significant amount of processing that takes place at DOE after the interagency review is concluded and assurances are provided. There is no reason, however, that the processing at DOE needs to be delayed until the interagency review stage is finished. The various offices in DOE do not need to see the government to government assurances themselves to sign off on Part 810 packages headed to the Secretary's desk for signature – it should already be understood that the activity will not take place without assurances being provided. This would save potentially months of processing time and give U.S. companies a decision sooner.

Returning to the model of the Secretary signing determinations subject to the receipt of assurances would be an even greater step forward and provide U.S. companies a more timely notification that the US government has approved the activity, pending the receipt of foreign government assurances. This would reduce uncertainty for U.S. businesses without any reduction in nonproliferation controls.

Recommendation 4: *DOE should work with the White House to ensure that the consulting agencies (DOC, NRC, and DOD) provide their statutory consultations in a timely manner during the interagency stage of review. After a reasonable amount of time (e.g., 30 days) reviewing the application, silence from the consulting agencies should not hold up the process.*

Section 57b of the Atomic Energy Act requires the Department of Commerce, the Nuclear Regulatory Commission, and the Department of Defense provide consultations to the Secretary of Energy as part of his or her determination regarding the inimicality of a given activity. To help shorten the processing time for the middle stage of the specific authorization process, the interagency should be expected to provide its views on part 810 applications in a timely manner – for example, 30 days. As a model for enforcing timely licensing decisions, DOE should look to U.S. government licensing of dual-use nuclear goods.

The Department of Commerce (DOC) Bureau of Industry and Security (BIS) says in its Annual Report for Fiscal Year 2016[17] that it processed 33,615 export license applications. BIS approved 28,761 license applications (85.6 percent), returned 4,552 applications without action (13.5 percent), and denied 302 applications (.9 percent). In FY 2016, BIS's average processing time to review a license application was 22.4 days. This includes time for reviews by other agencies.

The numbers above are for all of licenses processed by DOC. Looking specifically at the export or re-export of items controlled for nuclear nonproliferation reasons, in FY 2016, BIS approved 2,009 applications, valued at $1.6 billion. In addition, BIS rejected 11 applications valued at $4.6 million and returned without action 92 applications valued at $144.2 million.

The timely issuance of dual-use item export licenses is aided by Executive Order 12981, which established timelines for responses and procedures for resolving disagreements. If an agency does not respond within a given time period, its silence is taken for assent and the licensing process is not delayed. If agreement is still not reached after 90 days, a licensing decision goes to the President[18]. One obvious difference with Part 810 is that for dual-use licensing, all of the agencies involved have an equal vote in dual-use licensing, whereas only the State Department has an equal (concurrence) role along with DOE in Part 810 licensing.

[17] U.S. Department of Commerce, Bureau of Industry and Security, Annual Report to Congress for Fiscal Year 2016
[18] Slide 25: https://www.bis.doc.gov/index.php/documents/compliance-training/export-administration-regulations-training/597-nuclear-technology-policy/file