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## **Keeping Atoms for Peace from Being Overshadowed by Secrecy: The Case of Nuclear Exports**

Summary: There is increasingly less transparency about nuclear cooperation agreements, export licensing, export controls and the value of exports from the US nuclear industry. There is also less information made available to the public about nuclear proliferation trends. It will become increasingly difficult for policymakers and outside experts to connect the dots between what the US is subsidizing, exporting, and how it is being used or misused by partners and competitors alike to reduce or exacerbate proliferation. The US Congress and the next administration can make changes to return to or increase transparency and thereby vastly improve policymaking capabilities.

### **Introduction**

In the age of endless tweeting and instantaneous posting of sensitive information, not to mention inadvertent releases of information, it is hard to imagine any area of public life that is experiencing a decline in transparency. The nuclear power sector has historically and consistently opted for the “glass half full” perspective, projecting far more optimistic outcomes than it has been able to deliver.<sup>1</sup>

Recent decisions by the US government have further decreased the amount of reliable information available to the public and to Congress. The impetus to restrict information springs from the desire to promote nuclear exports at the expense of critical reviews. That desire is aided, quite consciously, by the promotion of the commercial nuclear industry as essential to national security.<sup>2</sup> This has had the counter-intuitive effect of streamlining export licensing and reviews of nuclear cooperation agreements.

In April 2020, the Department of Energy released the “Restoring America’s Competitive Nuclear Energy Advantage,” a report produced by the White

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<sup>1</sup> From early U.S. projections of nuclear electricity being “too cheap to meter” to IAEA rosy growth scenarios, to individual countries’ unrealistic targets for growth, it is the exceptional forecast that is accurate. Some of the early enthusiasm in the United States can be attributed to unfamiliarity with the challenges of scaling up nuclear power. As those challenges became more apparent over time, enthusiasm shifted to protect the nuclear industry from criticism and to bolster negative public opinion.

<sup>2</sup> The argument suggests that if the nuclear weapons enterprise depends on a vibrant commercial nuclear industry and that commercial industry depends on exports because the US itself is not building many new nuclear power plants, then national security requires us to export new nuclear reactors overseas.

House's Nuclear Fuel Working Group. The strategy explicitly claimed (on the cover) to assure U.S. national security through nuclear energy and listed eight national security reasons underpinning the strategy:

1. Uranium is a critical mineral (a departure from precedent)
2. Importance of nuclear energy for resilient electricity/critical infrastructure
3. DoD needs nuclear power for forward operating installations (also new)
4. Dependence on global nonproliferation and safety, which the US champions
5. Importance of foreign policy relationships (cemented by nuclear cooperation)
6. LEU for tritium production for nuclear weapons and HEU for naval reactors (previously reliant upon hundreds of tons of stockpiled HEU)
7. Assured uranium supplies (also new)
8. Civilian workforce base.

The strategy has four objectives: provide immediate financial support/subsidies to U.S. uranium mining and the front end of the fuel cycle; decrease permitting and regulatory burdens on industry in the front end; support advanced technology and empower U.S. export competitiveness.<sup>3</sup> In this last category of empowering US exports, there were eight individual tasks, several of which are relevant to this discussion. One was to “increase efficiencies in the export processes and adoption of 123 agreements to open new markets for exports of U.S. civil nuclear energy”; a second and third focused on opening up investment and financing for exports (under the International Development Finance Corporation, formerly OPIC) and a fourth was to expand civil nuclear international cooperation programs.

For the purposes of this paper, the big impact of these policies has been to push nuclear cooperation to the sidelines of 123 agreements, with the following impacts:

- more secrecy about Part 810 authorizations, designed to protect firms, not US nonproliferation interests
- more secrecy about 123 agreements and less information to Congress
- more secrecy about nuclear exports and their value

### **Part 810s**

With respect to increased efficiencies relative to 123 agreements, the strategy declared that “Consistent with the process improvement achieved in 2019 for Part 810 applications, the USG will ensure that high standards, consistent with U.S. law are maintained while investigating methods to further increase efficiency in the processes for each.”

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<sup>3</sup> Streamlining regulations on the front end amounts to overturning the ban on uranium mining on protected lands, including around the Grand Canyon.

What was the process improvement for Part 810 in 2019? Faster processing of Part 810s, which means looser restrictions around the export of nuclear technology and assistance to countries with which the US may not have a full nuclear cooperation agreement.<sup>4</sup> There are two ways to achieve faster processing: put more countries in the general authorization category or process specific authorization requests more quickly.<sup>5</sup> The first approach is harder – only three countries are on the general authorization list that do not have Section 123 agreements with the United States and all three formerly had agreements that have expired – Chile, Colombia and Mexico.

The second approach, which is to process specific authorizations more quickly, is apparently the one that saw improvement in 2019. According to the annual report to Congress on Transfers of Civil Nuclear Technology (a requirement of Section 3136 (e) of the FY16 NDAA; PL 114-92), the Department of Energy cut its approval time of Part 810 requests in half in 2019. However, the report to Congress gives no information regarding kinds of technology or information, countries, or suppliers.<sup>6</sup> Much of the work is done by DoE, determining whether a recipient country has met 10 requirements, mostly related to whether the US has assurances from and the recipient has honored its nonproliferation commitments and treaty obligations. One factor is whether comparable assistance and technology is available from other sources (and here, the number of nuclear suitors Saudi Arabia has is likely to come into play). The State Department must concur and the NRC must be consulted. There is no current requirement to inform Congress. However, the code of federal regulations states that (10 CFR 810.9 (e)) within a month of granting a specific authorization, a copy of the Secretary of Energy's determination "may be provided to any person requesting it at DoE's Public Reading Room, unless the applicant submits information demonstrating that public disclosure will cause substantial harm to its competitive position.

Between 2017 and 2019, the Secretary of Energy authorized eight technology and information transfers under Part 810 (special authorizations) to Saudi Arabia,

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<sup>4</sup> For an excellent primer on Part 810 authorizations, see Paul Kerr and Marybeth Nikitin, "Nuclear Cooperation: Part 810 authorizations, available at: <https://crsreports.congress.gov/product/pdf/IF/IF11183>

<sup>5</sup> Part 810 of the Code of Federal Regulations (10 CFR 810) controls the export of nuclear technology and assistance in two ways: some activities are "generally authorized" by the Secretary of Energy and thereby require no further authorization under Part 810 by DOE prior to engaging in such activities. For activities and/or destinations that are not generally authorized, Part 810 requires a "specific authorization" by the Secretary. Part 810 also details a process to apply for specific authorization from the Secretary and specifies the reporting requirements for generally and specifically authorized activities subject to Part 810. Violations of section 57 b. of the AEA and Part 810 may result in revocation, suspension, or modification of authorizations, pursuant to [10 CFR 810.10](#), as well as criminal penalties, pursuant to [10 CFR 810.15](#).

<sup>6</sup> See Department of Energy, Transfers of Civil Nuclear Technology, Report to Congress, April 2020, available at: <https://www.energy.gov/sites/prod/files/2020/04/f74/Final%20-%20EXEC-2019-000810%20Transfers%20of%20Civil%20Nuclear%20Technology%20Report.pdf>

reportedly to facilitate negotiations regarding a nuclear cooperation agreement. Unlike previous Part 810 authorizations, which DoE made available to read at its headquarters, these were kept secret. Congressman Brad Sherman requested Secretary of State Pompeo to release the company names, but there is no public record of this. Several of these transfers occurred after the murder of Jamal Kashoggi and after Crown Prince Mohamed Bin Salman told CBS News in 2018 that the kingdom would develop nuclear weapons if its rival Iran did.

According to NNSA, companies requested that the authorizations were kept secret to protect proprietary information.<sup>7</sup> According to the NRC, the dates of the requests from DoE to review the special authorizations were: 2017 (Nov 3); 2018 (Jan 5, 9; Feb 12; May 18; June 20; Oct 23) and 2019 (January 22).<sup>8</sup> Given the extraordinary comments from Saudi officials regarding their intentions to meet Iranian proliferation with their own proliferation, their recently exposed activities regarding uranium mining and conversion reportedly with Chinese help, and their steadfast refusal to bring their safeguards agreement up to current, accepted standards, DoE's interpretation of the law to protect proprietary interests over nonproliferation is inimical to U.S. interests.

### **Section 123 agreements**

Over decades, the executive branch has acted to minimize scrutiny of nuclear cooperation agreements in the following ways:

- a. Consultation comes at the end of the negotiating process, with a final copy of the signed agreement to approve. This was not the intent of the Atomic Energy Act.
- b. The nonproliferation assessments required by law have become increasingly *pro forma*, with some even failing to mention former nuclear weapons programs in recipient countries.
- c. The adoption of rolling extensions and unlimited duration treaties without any requirement for periodic review.<sup>9</sup>

The text of many U.S. nuclear cooperation agreements had been available prior to the Trump administration on the DoE website. This is no longer the case. The DoE/NE website now shows a map of countries that have Section 123

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<sup>7</sup> Timothy Gardner, "US approved secret nuclear power work for Saudi Arabia," Reuters, March 27, 2019, available at: <https://www.reuters.com/article/us-usa-saudi-nuclear/u-s-approved-secret-nuclear-power-work-for-saudi-arabia-idUSKCN1R82MG>

<sup>8</sup> NCR responses to request from Senator Chris Van Hollen on NRC approval of DoE Part 810 authorizations to Saudi Arabia, available on <https://www.nrc.gov/docs/ML1910/ML19108A014.pdf>

<sup>9</sup> Sharon Squassoni, "Civilian Nuclear Cooperation Agreements: Enhancing Our Nonproliferation Standards," Testimony before the Senate Committee on Foreign Relations, 20 January 2014  
"Nuclear Cooperation and Nonproliferation: Reconciling Commerce and Security," Testimony before House Foreign Affairs Committee, September 24, 2010.

agreements with the US and there is a list of those countries with the expiration dates of the agreements (not updated).<sup>10</sup>

Not being able to compare the texts of 123 agreements makes it more difficult for anyone to question or criticize US policy. For example, the US executive branch has stated it would seek restrictions on enrichment and reprocessing (the two technologies used to create fissile material for peaceful nuclear fuel or for a nuclear weapons) on a case-by-case basis. Without having access to U.S. agreements with countries in the Middle East (e.g., the UAE and Egypt) or, in fact, all US agreements, it would be difficult to know that the US has a specific policy to ensure that states in the Middle East rely on the international market for fuel, rather than developing their own enrichment or reprocessing capabilities (regardless of whether the US cooperates in such). The texts of 123 agreements can be found in the Congressional Record, but this is hardly a user-friendly option.

More importantly, in early 2019, the U.S. State Department announced a new strategic approach to nuclear cooperation agreements. It was not clear whether the Nuclear Cooperation MOUs are meant to supplant Section 123 agreements or merely pave the way for easier negotiations. According to Assistant Secretary of State Chris Ford, the MOUs should build strategic ties with the US, its experts, industry and cutting-edge researchers about how best to tailor future opportunities to its specific needs. Ford told a Hudson Institute audience that “We would use these ties to help states build their own infrastructure for the responsible use of nuclear energy and technology and adopt best practices in nuclear safety, security, and nonproliferation, including regulatory oversight.”

Apparently, the solution to cumbersome 123 negotiations is ad-hoc nuclear cooperation MOUs to get a foot in the door and the US public and Congress will have no idea which companies or countries this is occurring in.

In addition, one of the traditional routes for keeping an eye on foreign nuclear technology development – international nuclear cooperation through DoE – appears to be, from budget documents, severely cut back in the FY21 budget. The DoE Office of Nuclear Energy website shows updates as recent as October 14, 2020 regarding funding for advanced reactor projects, but here’s what hasn’t been updated:

- *The website of the Office of International Nuclear Energy and Cooperation has not been updated to reflect the halt in cooperation with Russia or China (although the FY21 budget reflects a cut of \$3M for international nuclear energy cooperation)*

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<sup>10</sup> Comically, the International Trade Administration (Department of Commerce) guide for exports has an entire section devoted civil nuclear exports (<https://www.export.gov/industries/civil-nuclear>) that redirects the user to PM/Director of Defense Trade Controls website for 123 agreements, despite the fact that PM has no jurisdiction over 123 agreements.

- *International Nuclear Energy Research Initiative (I-NERI) under the Nuclear Energy division of the Department of Energy stopped publishing annual reports on the website in 2015*

### **Value of nuclear exports/jobs**

The U.S. nuclear industry often markets itself as a source of high-paying, skilled jobs, whether in promoting nuclear power in domestic markets or to promote foreign exports. The Nuclear Energy Institute (lobbyist for nuclear energy industry with some foreign firms) contends on its website that a single nuclear power plant generates more jobs than any other type of electricity generation station.<sup>11</sup> To support that statement, NEI claims that each plant employs 500 to 1000 workers; construction at peak requires 3500 workers; salaries are 20% higher than for other electricity generating plants; and each plant creates \$40M in labor income each year.

These numbers are hard to reconcile with the US. Bureau of Labor Statistics data from 2017, which claim a total of 6,010 nuclear power operator jobs in the United States. In 2019, there were 35,500 power plant operators and 5300 nuclear power plant operators, which suggests that npp operators occupied 12% of power plant operator workforce while they generated 20% of US electricity. From a labor-saving perspective, this is impressive, but that is the opposite view industry would like to portray. (Solar and wind probably use even fewer laborers). It is true that nuclear power reactor operators earn more (median annual wage in 2019 was \$100,530) than other power plant operators (\$81,990), probably because they need more than a high school education and must be licensed by the NRC, typically after working in the plant in an apprenticeship capacity. A 20% premium seems actually modest, considering the requirement for scheduled updates in training and certifications.

The value of nuclear exports (and the contribution of new nuclear cooperation agreements) is similarly murky. NEI estimated years ago that the nuclear export market could bring 185,000 US jobs and \$125 billion in revenue from 2014 to 2024. It's hard to know how "revenue" is calculated. A CRS memo, quoted in a memo released by Senator Ed Markey's office in 2014, suggested that fuel exports constituted about \$1.9 billion/year while other nuclear reactor technology (at least from 2009 to 2012) constituted about \$350 million/year.

That said, the International Trade Administration's Top Markets report for 2017 ranked the following export markets for the US nuclear industry as promising:

- For new build: UK, China, India, UAE, Mexico and Poland
- For services to existing plants: China, UK, France, Canada and India
- For decommissioning work: UK, Japan, Sweden, Taiwan and Switzerland

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<sup>11</sup> There's no explanation for how this is calculated (whether over the lifetime of the plant or whether by comparable level of electricity generation). NPPs in the US generate large amounts of electricity because smaller sized plants are comparatively less economic (both are uneconomic in the United States, but small plants especially).

Obviously, the UK's exit from the EU and EURATOM in January 2020 has required negotiation of a new 123 agreement with the UK, which was previously covered under the US-EURATOM treaty. A 123 agreement was submitted to Congress in May 2018 but it is not clear what its status is. However, the UK is unlikely to be a huge importer of US nuclear power plants. Chinese exports have been halted as a matter of policy in October 2019 and no exports to India have materialized since the US-India nuclear deal was inked in 2005, for a variety of reasons. The US still has a decent foothold in nuclear fuel sales, but some of the more recent steps by the US government to promote uneconomic but domestically sourced uranium could threaten that cost-effectiveness, whether the fuel is used at home in our nuclear power plants or for overseas sales.

### **Recommendations**

1. On Part 810s: there is no reason why there should be any secrecy about what is being provided under general or specific authorizations. Making these available in the DoE Reading Room is hardly publishing the information in the Federal Register.
2. On Section 123s: Congress should be specific about the information it requires in order to make timely, informed decisions about these agreements. The use of infinite duration is bad for nonproliferation and period reviews should be implemented.
3. On nuclear exports: The US government should have good data in order to be able to assess the true economic value of U.S. nuclear exports, rather than wrapping them in the national security flag.

### LINKS TO RECOMMENDED READINGS

Blundering Toward Nuclear Chaos – chapter on Making Nuclear Energy Great Again – [www.globalzero.org/blundering-toward-nuclear-chaos-2020/](http://www.globalzero.org/blundering-toward-nuclear-chaos-2020/)

Testimony on uranium as critical mineral

<https://naturalresources.house.gov/imo/media/doc/4.%20Testimony%20-%20Sharon%20Squassoni%20-%20EMR%20Leg%20Hrg%2006.25.19.pdf>

Testimony on 123 agreements (January 20, 2014)

<https://www.foreign.senate.gov/hearings/section-123-civilian-nuclear-cooperation-agreements>

CRS report on Part 810s <https://crsreports.congress.gov/product/pdf/IF/IF11183>