

Statement before the U.S. House Committee on Foreign Affairs

"NUCLEAR COOPERATION WITH CHINA: STRONG RULES BUILD STRONG PARTNERS"

A Statement by

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Mr. Chairman, Mr. Ranking Member, Members of the Committee, I thank you for this opportunity to appear before the House Committee on Foreign Affairs Joint Subcommittee to discuss the proposed U.S. agreement for peaceful nuclear cooperation with the People's Republic of China, including China's record on proliferation of weapons of mass-destruction-related materials and technologies.

Nuclear cooperation agreements, like nuclear energy, carry inherent risks. As vehicles for transferring technology, material and equipment that can serve both peaceful and military uses, they must balance competing objectives: to facilitate engagement but limit the proliferation potential of that engagement. Their use in cementing strategic relationships can often come into conflict with their basic purpose of delineating the substance and methods of collaboration. The more important the relationship is in terms of commercial, political and security needs, the greater the pressure is to adjust the balance of obligations towards facilitating engagement. This has been demonstrated many times over, most recently in the case of the agreement with South Korea.¹ This testimony will focus on commercial and nonproliferation considerations, as well as offer some ways to strengthen congressional oversight in this important area.

Background

The United States signs the majority of its peaceful nuclear cooperation agreements (known as 123 agreements after the relevant section in the Atomic Energy Act of 1954, as amended, hereafter AEA) with non-nuclear-weapon states. This is for obvious reasons – thankfully, there are not that many "legitimate" nuclear weapon states and our laws (and good sense) prohibit us from cooperating with states that have not taken on nonproliferation obligations under or akin to the Nuclear Nonproliferation Treaty (NPT). This agreement with China is one of four that the United States has signed with nuclear weapon states: Euratom in 1995 (which includes the UK and France), with India in 2006 (a special case) and with Russia in 2008. One might conclude that agreements with nuclear weapon states do not pose the same risks as those with

¹ The ROK agreement, which was extended for two years because of difficult negotiations, was signed by President Obama in June 16, 2015. South Korea's demands for advance consent for enrichment and reprocessing, which U.S. policy has long rejected for countries that do not currently have enrichment or reprocessing, were repeatedly framed by Korean senior officials in the context of the strategic ROK-US alliance. The compromise included a firstever High Level Bilateral Commission (HLBC) within the agreement "to facilitate peaceful nuclear and strategic cooperation between the parties and ongoing dialogue regarding areas of mutual interest in civil nuclear energy, including the civil nuclear fuel cycle." Regarding sensitive nuclear technology, the agreement allows (per amendment of the agreement or by "a separate agreement between the Parties" transfer of SNT and technology that is not in the public domain concerning fabrication of nuclear fuel containing plutonium. While it does not grant advance consent for reprocessing, it states that uranium enrichment up to 20% U-235 is permissible if the Parties agree in writing on an arrangement to do so, following HLBC consultations and consistent with the Parties' applicable treaties, national laws, regulations, and license requirements.

non-nuclear weapon states, but U.S. law treats them virtually the same. Only two of the nine criteria contained in Section 123 of the AEA, as amended, differentiate between nuclear-weapon-state and non-nuclear-weapon-state agreements: non-nuclear weapon states are required to have full-scope safeguards (rather than just safeguards on materials and equipment subject to the agreement) and in such agreements, the U.S. has the right of return if the country detonates a nuclear explosive device or abrogates its safeguards agreement. In the case of Euratom, the agreement does contain provisions for termination in the case of abrogation of safeguards or a nuclear weapons test, yet in the case of the agreement with India, neither abrogation of safeguards nor nuclear testing was explicitly cited as grounds for termination. Instead, provisions regarding termination and right of return in the India agreement contained unique clauses designed to dissuade the parties from such actions.²

The ostensible reason for treating all agreements similarly is that although small, there is still a risk even in cooperating with nuclear weapon states that materials, technology, and equipment could be diverted to military uses. U.S. export policy acknowledges these risks by requiring specific authorization for Part 810 transfers (nuclear technology) to China, Russia and India. In most cases, countries with 123 agreements qualify for general authorization of transfers, but these are the exceptions. In explaining the proposed rulemaking regarding 10 CFR 810 that became effective in March 2015, the Department of Energy's National Nuclear Security Agency (NNSA) stated that "China and Russia are nuclear weapon states that have not provided the level of transparency regarding the division between their respective civilian and military nuclear programs to warrant general authorization of transfers of technology and assistance for peaceful use." ³ In other words, increased scrutiny is needed.

In the time that the United States has been actively engaged in nuclear trade with China, there have been significant improvements in China's nonproliferation behavior but also persistent opacity in certain areas, and poor enforcement in others, especially export controls. At the same time, China's astounding appetite for energy has merely been whetted by the biggest nuclear new build program in thirty years. While it is tempting to favor commercial considerations above others, particularly since nuclear power construction has been flagging in

² Section 129 (a) (1) (A) of the Atomic Energy Act of 1954, as amended, contains the relevant provision under law that would call for termination of nuclear exports if a non-nuclear weapon state detonated a nuclear explosive device or terminated or abrogated IAEA safeguards. In many (if not most) U.S. agreements, this clause is explicitly included in 123 agreements but it was not included in the India agreement for obvious political reasons.

³ 6450-01-P, Department of Energy, 10 CFR Part 810, RIN 1994-AA02, Assistance to Foreign Atomic Energy Activities, p. 27. Available at: <u>http://nnsa.energy.gov/sites/default/files/nnsa/07-13-inlinefiles/2013-07-31%20SNOPR.pdf</u>

the United States, the current debate over Iran points to the importance of ensuring that peaceful nuclear energy remains just that.

China as a nuclear energy partner

On the commercial side of the ledger, the reasons for continued engagement in nuclear trade with China are compelling. China reportedly will be spending about \$11B per year in the next decade on nuclear power plant construction (China has 27 operational reactors, is building 24 reactors and double that number by 2030) at home.⁴ What's more, it is one of the few U.S. partners actually buying U.S. commercial nuclear power reactors, which was not true in the case of recent agreements with Russia, India or South Korea. Cutting off existing nuclear cooperation would affect ongoing projects as well as future plans for more Westinghouse-designed AP-1000s to be deployed in China's interior.

If China were merely content to buy U.S. reactors indefinitely, the commercial incentives might in fact be overwhelming for the U.S. nuclear industry. However, in addition to developing its own indigenous reactors based on the first 300 MWe reactor at Qinshan, China has avidly sought foreign technology with the goal of indigenizing it. The first French reactors at Daya Bay had 1% indigenous content (Framatome design based on Combustion Engineering) while those coming on-line ten years later at Lingao had 64% indigenous content (also Framatome).⁵ Ten years later (2013), the CPR-1000 reactors at Yangjiang contain 85% domestic Chinese supply.

Westinghouse itself has done much to facilitate technology transfer since its cooperation with China began over a decade ago. On its website, Westinghouse boasts that "Our technology is the basis for nearly 50% of the world's operating commercial nuclear power plants...A leader in technology transfer, Westinghouse has successfully transferred design and manufacturing capabilities to many countries, including France, Japan and Korea." To this list it should add China. Westinghouse's 2006 technology transfer agreement with the Chinese for the AP-1000

⁴ China expects to have 88 GWe of nuclear power capacity operating and under construction by 2020. The previous target for 2020 was 70 GWe operational. By 2030, the target was revised downwards from 200 GWe to 150 GWe of capacity. The 2050 target goal is 400 GWe of nuclear power plant capacity, which would constitute about 16% of China's anticipated electricity generation. By comparison, the United States has about 99 GWe of operating reactor capacity at present. See Chinese Academy of Engineering (CAE) report entitled "Energy Development Strategy of China in Mid- and Long-terms (2030, 2050)," published in February 2011.

⁵ S. Lau, CGNPC, "CPR1000 Design, Safety Performance and Operability," July 5, 2011 presentation to IAEA Advanced Nuclear Reactor Technology meeting. For Lingao 1 and 2, this can be further broken down: 11% of the nuclear island, 23% of the conventional island supply and 50% of the balance of plant were indigenous content. For Lingao 3 and 4, Dongfang was the equipment supplier, while for Lingao 1 and 2, Framatome and Alstom were still suppliers. CGNPCS's equipment localization for Lingao I was 30%; for Lingao II 60%; for Hongyanhe 70-80%; for Ningde 75-85%; and for Fangchenggang up to 90% for units 5 and 6. See

https://www.iaea.org/NuclearPower/Downloads/Technology/meetings/2011-Jul-4-8-ANRT-WS/1 CHINA CPR1000 CGNPC S.Lau.pdf

is well-known but in 2008 and 2009, Westinghouse also signed agreements with China's State Nuclear Power Technology Corporation (SNPTC) to develop the CAP-1400. This reactor will be China's version of the AP-1000 for deployment at home and for export.

This first-of-a-kind reactor is being built at the HTR-10 Shidaowan site with Shanghai Nuclear Engineering R&D Institute. According to the World Nuclear Association, SNPTC will own the intellectual property rights for reactors above 1350 MWe; a larger variant at 1700 MWe reportedly is also planned.⁶ One of 16 so-called "Key National Projects" in China, the CAP-1400 could take the place of the AP-1000s earmarked for inland sites, but could also wind up competing with Westinghouse's AP-1000 in other markets in Asia and beyond.

If there were any doubts about government support for Chinese nuclear exports, the Chinese government announced new financing incentives for industry exports, including for nuclear power and railways in January 2015.⁷ China could focus on marketing its own designs, like the Hualong One (ACP-1000, which is a scaled-up version of the Chinese 300MWe reactor at Qinshan), or partner with vendors like Westinghouse or do both. Chinese nuclear firms reportedly are pursuing two Hualong units for a site in Karachi, Pakistan, but China's SNPTC is also reported to be marketing four nuclear power plants (2 AP-1000s and 2 CAP-1400s) with Westinghouse in Turkey. Other rumored deals involve Argentina, Romania, and financial interests in the UK's Hinkley Point C plant (under construction and in trouble) and in Slovakia's nuclear power plants.⁸ Moreover, there are signs that China is positioning itself to compete with Russia as a major nuclear fuel. Either of these two developments could significantly hurt U.S., South Korean, Japanese and French nuclear vendors. In that case, any financial windfall from renewing the nuclear cooperation agreement with China may not materialize as expected.

China as a nonproliferation partner

The unclassified Nuclear Proliferation Assessment Statement, or NPAS, that accompanied the proposed 123 agreement with China, describes a country that has come a long way in improving its nonproliferation credentials, but has further to go. While it stopped short of calling China a nonproliferation partner, it stated that China plays an important role in U.S. efforts to denuclearize the Korean peninsula and in addressing concerns about Iran's nuclear program. The argument for cooperating with China is reminiscent of the one used in favor of

 ⁶ See <u>http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/China--Nuclear-Power/</u>
⁷ ibid.

⁸ "China's CNNC: may bid for Enel's Slovak power firm stake but no decision yet," Reuters, June 28, 2015, available at: <u>http://www.reuters.com/article/2015/06/29/enel-equity-slovakia-cnnc-idUSL4N0ZF03Y20150629</u>

cooperation with India: this agreement is important for incentivizing the recipient state to do better on nonproliferation. Examples of improvement in nonproliferation behavior and policies help support the claim that its behavior is "good enough" to merit cooperation in the first place. For example:

- China, once a purveyor of nuclear weapons plans and material (HEU and designs to Pakistan), became a member of the NPT (1992) with a voluntary safeguards agreement and Additional Protocol (2002), a member of the Nuclear Suppliers Group (NSG, 2004), and a member of other proliferation-relevant treaties (BWC, CWC, CTBT). This evolution occurred over the last 25 years – largely <u>after</u> the first 123 agreement was signed in 1985.
- China has historically taken a skeptical view of export controls as cartel-driven efforts. However, a little over a decade ago, China began putting in place significant export control structures (legislation, processes).

The key issue is China's weak implementation of national export controls, and this may be one of the reasons why members of the Missile Technology Control Regime (MTCR), Australia Group, and Wassenaar Arrangement have been skittish about Chinese membership. China's lax enforcement of domestic export control policies and regulations targeting proliferation – which have been documented for close to 20 years – still results in "concerns about China's nonproliferation record."

- Three areas that could improve Chinese enforcement are a) criminalization of violations (vice imposition of civilian penalties); b) more and better trained personnel to track implementation; and c) more intelligence assets targeted on smuggling. Even in instances (for example, against Zibo Chemet dual-use chemical equipment transfers) where the Chinese government has taken punitive actions, repeated transfers suggest that penalties are insufficient to deter future transfers.
- For many years, the bulk of U.S. sanctions on Chinese entities have been for missile- and chemical-related transfers. In the last five years, Chinese entities have appeared 23 times on the State Department's list of nonproliferation sanctions. A small handful of entities are repeat offenders (like Karl Lee and his front company LIMMT aka Dalian Sunny Industries), earning them the sobriquet of "serial proliferators." In all, ten entities were sanctioned, all in the missile and chemical areas.

At this juncture in time, Congress needs to ask the following questions:

a) Does this new agreement provide adequate nonproliferation assurances?

b) Will this agreement help to improve China's export control behavior?

c) Are there conditions that could improve the robustness of non-proliferation collaboration and reduce proliferation risks?

Does the agreement provide adequate nonproliferation assurances?

The Nuclear Proliferation Assessment Statement has two objectives: to analyze the consistency of the agreement with the requirements of the Atomic Energy Act, and particularly the nine nonproliferation requirements in Section 123 a of the AEA, and to analyze the adequacy of safeguards and other control mechanisms and peaceful use assurances to ensure that any assistance will not be used to further any military or nuclear explosive purpose.

This committee is doubtlessly well aware of why nuclear exports under the 1985 agreement took 13 years to authorize. Significant concerns about China's proliferation record, particularly with respect to nuclear weapons-related transfers to Pakistan, prompted Congress to pass a joint resolution of approval (P.L. 99-183) that conditioned licenses for exports. These related to effective exchanges of information and visits to nuclear sites because the original agreement did not require International Atomic Energy Agency (IAEA) safeguards (because China is a nuclear weapon state under the NPT); certifications to the effect that China was not engaged in sensitive technology exchanges with Pakistan; and that language in the agreement calling for favorable consideration of consent for enrichment or reprocessing did not prejudice U.S. decisions to approve or disapprove of a Chinese request to enrich or reprocess U.S.-origin material.

Compared to the 1985 agreement, the proposed agreement is an improvement in terms of its meeting the requirements of the AEA and China provided assurances prior to 1998 that it halted sensitive technology exchanges with Pakistan. The issues today are somewhat different in terms of nonproliferation assurances.

The first category of nonproliferation assurances is whether or not China's civilian nuclear enterprise is adequately separated from its military nuclear weapons program. As in other nuclear weapon states, Chinese military nuclear weapons programs predated civilian uses of nuclear energy. Historically, China sought to convert military facilities to civilian purposes as a cost-saving measure. China National Nuclear Corporation (CNNC), one of the two major nuclear entities in China, is responsible for the development of both the military and civilian nuclear programs. This duality is evident at sites like the Jiuquan Atomic Energy Complex, where decommissioned military production facilities are co-located with civilian production facilities, and at the Lanzhou uranium enrichment plant. Because China voluntarily places facilities under IAEA safeguards, facilities co-located with military assets are unlikely to be placed on the eligible facilities list. Neither the pilot reprocessing plant at Jiuquan nor the Lanzhou centrifuge plant, built with Russian technology for commercial purposes, is safeguarded because of their co-location with former weapons program facilities. By contrast, the Russian-supplied centrifuge plants at Hanzhong are under IAEA safeguards. Looking ahead, it may serve U.S. interests for China to reprocess other countries' fuel (e.g., Taiwan's, South Korea's or Japan's) if that limits the spread of reprocessing. Such fuel could have U.S. safeguards obligations attached, given the close ties that the United States has had with those countries. Since the proposed agreement gives the fallback of reprocessing at facilities "that have been made eligible for IAEA safeguards" -- that is, facilities on the Chinese eligible list but potentially not safeguarded, this small loophole could create a political problem. I agree with other experts that China has no incentives to divert reactor-grade plutonium from civil nuclear power plants, but leaving the option open in the future for U.S. acquiescence to unsafeguarded Chinese reprocessing, if on a large enough scale and potentially for foreign customers, is short-sighted.

A bigger concern, as witnesses at other hearings have addressed, is the allegation that U.S. canned pump technology has made its way into Chinese naval reactors. Evidence of such a transfer could be interpreted as violating the terms of the existing 123 agreement, specifically the prohibition (Article 5.3) against using any "material, facilities or components... for any military purpose." The prohibition against any military use (except for very limited circumstances such as producing electricity for the military) is repeated in the proposed 123 agreement, possibly making this an ongoing issue.

At issue is whether assurances are adequate for technology and information transfers. The proposed agreement for the first time addressed technology and information exchanges by establishing an administrative arrangement that builds on the 2003 "Principle-Based Approach to Nuclear Technology Transfer Assurances." This is essentially a "fast track" for transfers related to nuclear reactors and equipment, conversion and nuclear fuel fabrication not containing plutonium. The parties would develop a list of pre-approved activities, technologies, and eligible entities, revising the list as needed. Congress needs to examine carefully whether this expedited procedure does in fact erect stronger firewalls against technology transfer from the civilian to military sectors in China. The hope is that participating entities will enjoy expedited authorizations, and therefore have incentives for stronger internal compliance procedures, and that the Chinese government will have greater incentives for policing behavior because violations could affect implementation of the nuclear cooperation agreement.

The second category of nonproliferation assurances has to do with China's nuclear exports.

China's NSG record has been marred by its continued nuclear supply to Pakistan, a country that does not qualify for exports since the NSG adopted the requirement for full-scope safeguards in 1992. Although some contracts were grandfathered when China joined the NSG in 2004 (Karachi nuclear power plant, Chasma 1 & 2 and PARR 1 & 2), China is taking a rather expansive

interpretation of these exceptions.⁹ As noted in the unclassified NPAS, Chinese plans to supply additional power reactors to Pakistan (Chasma 3 & 4, ACP-1000s at Karachi, or KANUPP 2 & 3 and potentially three others in central Pakistan). Members of the NSG did not assume that endorsing Chinese NSG membership in 2004 meant unlimited nuclear reactors to Pakistan, even if safeguarded. As political recompense for the 2008 India exception to NSG guidelines, this is hardly surprising, but continued disregard for NSG policies will undermine the regime. Given that China agreed with the 2008 exception for India, this unilateral approach will strain NSG policies even more than the 2008 exception for India did.

The third category of nonproliferation assurances is related to China's enforcement of export controls. Ultimately, the more important indicator of Chinese support for nonproliferation is their national implementation of export control guidelines. Effective export controls are the first line of defense, but countries were not obligated to adopt legislation on export controls until the 2004 adoption of UN Security Council Resolution 1540. China's reporting on its compliance with UNSCR 1540 has been spotty (the last report was made in 2007), and its implementation even weaker. One Ministry of Foreign Affairs official estimated in 2013 that, "China lacks resources and expertise to enforce its export controls.¹⁰ This is complicated by the "rapid growth of industries, an unenlightened legislature, separated regulations and ministerial decrees and weak or ambiguous linkage to law."

Will this agreement help improve China's export control behavior?

China joined the Zangger Committee to facilitate implementation of the 1985 agreement and later joined the Nuclear Suppliers Group. Since nuclear cooperation with China began in earnest with the Westinghouse AP-1000 reactor sales, Chinese officials have participated in various DoE, DHS and State Department training programs specifically in export control, as outlined in the unclassified NPAS. This is one way in which a framework cooperation agreement can facilitate better nonproliferation behavior. Ultimately, however, China will have to devote increased resources across the board to improve its capacity to detect, catch, investigate, and penalize export control violators. Increased transparency regarding

⁹ Patricia McNerney, Principal Deputy Assistant Secretary, international Security and Nonproliferation, Statement before the U.S.-China Economic and Security Review Commission, "China's Nonproliferation Practices," May 20, 2008, available at: <u>http://2001-2009.state.gov/t/isn/rls/rm/105084.htm</u>

¹⁰ Li Hong, Secretary General of China Arms Control and Disarmament Agency, CSIS Workshop of Strategic Trade Controls in Taipei, August 2013. <u>http://csis.org/files/attachments/130828_LiHong.pdf</u>

government cases may help in deterring future proliferation activity. As of 2012, there were only four to five publicly made cases of government penalization for export control violations.¹¹

U.S. concerns about China's export control behavior in the chemical and missile arenas are beyond the purview of this agreement. At most, promulgation of best practices in export controls in the nuclear area could have a spillover effect in other WMD-related areas. In the case of the U.S.-India 123 agreement, the Hyde Act called for termination of exports in the case of materially significant transfers of nuclear material, equipment and technologies by India inconsistent with the Nuclear Suppliers Group guidelines and transfers of ballistic missiles or missile-related equipment or technology inconsistent with MTCR guidelines. An alternative approach here would be for Congress to include a requirement for reporting by the executive branch on efforts to bring China into the MTCR, Australia Group and Wassenaar Arrangement and obstacles to those efforts. Another option would be to require regular reporting by the executive branch on efforts to secure China's participation in the Proliferation Security Initiative as a way of enhancing China's interdiction capabilities.

Are there conditions that could improve the robustness of non-proliferation collaboration and reduce proliferation risks?

As Congress demonstrated in 1985, placing conditions in a resolution of approval can effectively halt exports despite entry into force of a 123 agreement. At this juncture, such an approach would be highly counterproductive, with serious negative commercial and political consequences. On the other hand, Congress may wish to consider actions that could encourage greater transparency from China on the separation of military and civilian nuclear activities, encourage enhanced dialogue with or commitments from China regarding its civil nuclear cooperation with Pakistan, and provide benchmarks for progress in Chinese export control implementation. Specifically, Congress should consider:

a. Requirement for reporting on steps the Chinese government has taken to create firewalls between civilian nuclear and military nuclear sites, facilities and personnel, whether administrative or physical.

b. Requirement for reporting on steps the U.S. government has taken to seek Chinese restraint regarding civil nuclear cooperation with Pakistan, both with China and within the NSG.

¹¹ Chin-Hao Huang, "Bridging the Gap: Analysis of China's export controls against international standards," Final Project Report to Foreign and Commonwealth Office Counter-Proliferation Programme, April 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207441/Final_FCO_Huang_Chin ese_export_controls_report.pdf

c. Certifications every five years that China has taken appropriate and effective steps to improve its export control system and to halt transfers of WMD-related material, equipment and technology to North Korea and Iran and other states of proliferation concern.

d. As an adjunct to the certifications, a requirement for the Director of National Intelligence to provide annual unclassified (and classified) reports to Congress on WMD-related acquisitions and transfers from China. This would provide a substitute for the Section 721 reports that were discontinued in 2013.

e. Reporting on implementation of technology transfer administrative arrangements on an annual or bi-annual basis from the executive branch to assess their effectiveness.

f. Providing authorization for expanded export control cooperation.

Part of the challenge in collaborating with China in many areas has been the lack of transparency. These steps above would enhance that transparency and provide additional leverage to both the executive branch and the Congress in areas that are of importance and concern without unduly hampering continued civil nuclear cooperation.

Lastly, Congress should consider updating the Atomic Energy Act to strengthen its oversight and reflect new realities and support long-standing policies. Congress could consider the following actions:

1) Require congressional review of ongoing cooperation under 123 agreements with indefinite duration and/or rolling or automatic extensions.

2) Require all new nuclear partners (and in renewal agreements) to have Additional Protocols to their IAEA safeguards agreements in force before a 123 agreement can be approved. Making the Additional Protocol a legally binding requirement could eventually help NSG adoption of that requirement, in much the same way that countries adopted full-scope safeguards as a condition of supply before the NSG did.

3) Require the United States to provide favorable options or incentives to other countries in 123 agreements to adopt interim storage over reprocessing of spent nuclear fuel.

4) Require the executive branch to consult with Congress on the general scope of Nuclear Proliferation Assessment Statements or about individual NPASs before they are written or more substantially, specify additional reporting requirements for NPASs.