

# **Conditioning the U.S.-PRC Nuclear Cooperative Agreement against Further Military Diversions**

Testimony

of

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I want to thank Chairmen Poe and Salmon, Ranking Members Keating and Sherman, members of the subcommittees for inviting me to testify here today on the U.S.-PRC civil nuclear cooperation agreement and its nuclear proliferation implications. My message today is that although it would be a mistake to block the deal, our government needs to approach its implementation with its eyes wide open lest it encourage further Chinese military nuclear diversions and proliferation. China is already under suspicion of having diverted canned coolant pump technology to its submarine reactor program from the AP 1000 reactor design. We need to prevent further, more serious military diversions.

Towards that end, Congress should condition this agreement in two ways that do not require China's blessing and that will not hold up its implementation:

1. First, before any recycling of nuclear weapons usable plutonium from spent fuel generated in U.S.-designed reactors is authorized, require the President to certify that the U.S. will secure case-by-case authorizations for each reprocessing campaign the Chinese might attempt, as the U.S. currently requires of Russia.
  - a. In support of this requirement and the agreement's proposed controls over retransfers of U.S. nuclear equipment, components, and related technology, instruct the Executive to publish a clear definition of what a "U.S.-designed" reactor and U.S.-export controlled reactor component are in the Federal Register.
2. Second, have the President formally certify that the agreement's call for creating pre-approved nuclear activities, technologies, and foreign entities retransfer lists will in no way supersede or interfere with current implementation of existing case-by-case review procedures promulgated under 57b of the Atomic Energy Act.
  - a. In support of this requirement, ask that the Executive Branch to include the Director of National Intelligence in the coordination of all nuclear technology transfer authorization requests and that these requests and their final disposition be shared with the appropriate committees of Congress.

These conditions could be made part of a resolution of conditional approval before the U.S.-PRC agreement comes into force or be made law after the deal comes into force. Congress did the latter once before, following the Tiananmen Square massacre (see P.L. 101-246).

In addition to these conditions, Congress should also require our intelligence community produce a routine assessment of how Beijing might exploit its own civilian nuclear infrastructure and American nuclear technology for military purposes, and what might drive its future military nuclear requirements. Arguably, it was the lack of such systemic analysis that allowed the Executive Branch in 2007 to dismiss Congressional concerns that canned coolant pump technology might be diverted under the existing nuclear cooperative agreement.

## **Why Bother?**

On May 18, 2007, Chairman Royce along with Congressmen Jeff Fortenberry, Christopher Smith and Congresswoman Diane Watson wrote then-Secretary of Defense Robert Gates that U.S. Curtiss Wright canned coolant pumps might be diverted to upgrade China's nuclear submarine reactors. They also thought the loose requirements on China reprocessing U.S.-origin spent fuel into nuclear weapons-usable plutonium needed to be tightened. Essentially, they were told by the Executive Branch and the nuclear industry that there was no cause for concern.<sup>1</sup>

This brush off, however, was misguided. As we now know, the Executive Branch now suspects China diverted the canned coolant pump technology from the Westinghouse AP 1000 reactor to upgrade its nuclear submarine reactors. At a hearing on May 12<sup>th</sup>, Senator Bob Menendez more than suggested that from his reading of the intelligence that China had clearly diverted the technology in violation of the existing nuclear cooperation agreement.

To my knowledge, no one has been disciplined within our government nor has any change been made to our government reviews or assessments of nuclear technology transfer authorization requests from industry. Worse, rather than tighten these procedures, by coordinating these requests with the intelligence community or Congress, the proposed deal would fast track or streamline these authorizations by creating lists of nuclear activities, technologies and end uses for which "pre-approvals" would be possible. Industry, of course, has long pined for such a streamlining. If Congress allows it to be adopted for a country that has diverted or is strongly suspected to have diverted U.S. nuclear technology, though, industry is sure to get its way with every other case, including the very worst.

Of course, the deal does not just streamline nuclear technology and component transfers. It also gives China advance consent to extract as much nuclear weapons-usable plutonium as China wants from spent fuel generated in U.S.-designed reactors. All China must do to begin reprocessing is settle one time up front with the U.S. on physical security and safeguards arrangements. This will not be that difficult to meet. Unlike the nuclear deal the U.S. cut with Russia, which requires that the U.S. approve each and every Russian effort to reprocess U.S.-origin spent fuel case-by-case, the China deal gives blanket advance consent that the U.S. only grants its closest allies.

The security implications of such reprocessing could be quite significant. Westinghouse claims 40 of its AP 1000 reactors may be operating in China before the new, proposed nuclear deal runs out. Using conservative estimates, each one of these reactors can generate enough

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1. See Mark Clayton, "China, Nuclear Technology, and a Sale," *Christian Science Monitor*, May 30, 2007, available at <http://www.csmonitor.com/2007/0530/p03s01-usfp.html>.

plutonium for about roughly 37 weapons-grade or 48 reactor-grade nuclear weapons annually.<sup>2</sup> If all 40 were operating, this would equate conservatively to between 1,500 and 1,900 warhead equivalents a year, i.e., nearly the total number of nuclear weapons the U.S. currently has deployed. These estimates, it should be noted, do not include the plutonium that would be generated in China's scaled up copy of the AP 1000, the CAP 1400, which China expects to build in large numbers for domestic use and export.<sup>3</sup>

China has not yet decided to reprocess on a commercial scale. It has a pilot plant. It has reported to have produced only a minuscule 13.8 kilograms of separated plutonium.<sup>4</sup> Chinese nuclear experts I have spoken with understand that reprocessing will cost far more than any benefit it will impart. Several emphasized that assuring that the current light water reactors in China are safe is far more important and urgent than starting up any fast reactor program.

That said, AREVA, which is owned by the French government, just announced that it and China are now entering the final stages of negotiation over the possible construction of a reprocessing plant designed to produce between 1,500 reactor-grade and 2,000 weapons-grade bombs'

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2. See The Center for Global Security Research, "Verifying the Agreed Framework," (UCRL-ID-142036 CGSR-2001-001), April 2001, pp. 49 and 64, available at <http://fsi.stanford.edu/sites/default/files/VAF-June.pdf>. The Department of Energy estimate of 4 kilograms of plutonium per device is assumed for a first-generation weapons-grade device. 5.2 kilograms or 30 percent more is assumed for a similar reactor-grade explosive. For more details see Richard L. Garwin, "Reactor-Grade Plutonium Can be Used to Make Powerful and Reliable Nuclear Weapons," August 26, 1998, available at <http://fas.org/rlg/980826-pu.htm> and Thomas B. Cochran and Christopher E. Paine, "The Amount of Plutonium and Highly-Enriched Uranium Needed for Pure Fission Nuclear Weapons," April 13, 1995, available at <http://fas.org/nuke/intro/nuke/design.htm>.

3. When asked May 12<sup>th</sup> at the Senate Foreign Relations Committee if such reactors would be considered to be "U.S.-designed," the administration witness noted that what is or is not "U.S.-designed" is largely left to U.S. nuclear exporters determine. In the case of Toshiba-Westinghouse and Hitachi-GE, this should be a worry since U.S.-developed reactor design information is often sold to sweeten their reactor export offerings.

4. International Panel on Fissile Materials, *Global Fissile Material Report 2013*, P. 22, available at <http://fissilematerials.org/library/gfmr13.pdf>.

worth of plutonium annually.<sup>5</sup> This is substantially more plutonium than what China currently has on hand or could otherwise produce in its dedicated military production reactor.<sup>6</sup>

The immediate danger such reprocessing and our 123 deal's lax controls over it pose is not so much a focused, Chinese military nuclear build up as it is a broader, regional fissile material production race in East Asia. I just returned from a week-long visit with government experts and officials in Tokyo, Seoul, and Beijing. I was accompanied by several U.S. nuclear experts including a former U.S. Nuclear Regulatory Commissioner, a former nuclear weapons designer, and a former senior intelligence official. What we learned was worrisome.

Japan is contemplating opening a large plutonium reprocessing plant next spring at Rokkasho capable of producing 1,500 reactor-grade bombs' worth of plutonium a year. If Congress green lights the proposed PRC 123 without any further conditions on reprocessing, both Japan and the AREVA deal are likely to go ahead with little or no consideration of what the security implications might be. This, in turn, would put tremendous pressure on Seoul to demand that the U.S. allow it to recycle plutonium under the new deal. Allowing any or all of these things to proceed would mean that tens of thousands of weapons' worth of plutonium would mount up in East Asia well before it might ever be used. The way to think about this is as my former boss, Andrew Marshall of the Pentagon's Office of Net Assessment described it, as a nuclear avalanche in the making, just waiting to be triggered by the least provocation.<sup>7</sup> Clearly, letting this happen is in no one's interest.

### ***But Won't Conditioning the Deal Hamper Industry?***

The nuclear industry and Administration officials, of course, downplay these concerns. We are talking to China about nuclear proliferation in other forums, they argue. The Chinese are likely to proliferate anyway. On the other hand, we should not cut ourselves off from the business

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5. See CRIENGLISH, "France's AREVA Signs Agreements with Its Chinese Partners, EDF," July 5, 2015, available at <http://english.cri.cn/12394/2015/07/01/3742s885300.htm> .

6. According the Congressional Research Service, China currently has enough weapons plutonium stockpiled (1.8 tons) to make 450 nuclear weapons. It could also possibly restart its one military production reactor to make 75 bombs' worth of plutonium a year. See, International Panel on Fissile Materials, <http://fissilematerials.org/library/gfmr13.pdf> and Mark Holt, Mary Beth D. Nitkitin, and Paul K. Kerr, "U.S.-China Nuclear Cooperation Agreement," (Washington, DC: Congressional Research Service, RL33192, June 4, 2014), available at <http://fas.org/sgp/crs/nuke/RL33192.pdf> .

7. See Andrew Marshall, foreword to Henry D. Sokolski, *Underestimated: Our Not So Peaceful Nuclear Future* (Washington, DC: NPEC, 2015), p. xi , available at [http://www.npolicy.org/books/Underestimated/Full\\_Book.pdf](http://www.npolicy.org/books/Underestimated/Full_Book.pdf).

and possible influence it might afford. The French and other nuclear vendors will only take up the business the U.S. would otherwise ply. The Chinese, moreover, will never want or need more than the 450 additional nuclear weapons they could fashion out of the military plutonium they now have. Besides, weapons-grade plutonium is best made in dedicated military reactors.

Although handy, much of this argumentation is misleading. Only a few members of Congress are considering voting to disapprove the nuclear deal. Most, instead, are focused on how to condition its approval, as Congress did with the original PRC nuclear agreement back in 1985.

Nor is losing manufacturing jobs to other nuclear exporters all that likely or even possible. In fact, the only major U.S.-headquartered nuclear reactor exporter, Westinghouse, is entirely owned by Japan (Toshiba 87% and IHI 3%) and Kazakhstan (Kazakatom 10%). All of the proceeds from any Westinghouse export to China go entirely to these overseas stockholders. In addition, almost no U.S. manufactured nuclear good that requires a Nuclear Regulatory Commission export license is any longer being made in the U.S. U.S. firms are making canned coolant pumps (Curtiss-Wright and Enertech) and special valves (SPX Corporation) for the AP 1000, but because China wants to make these components itself, it is unlikely these U.S. manufacturing efforts will grow.

Also, the only French reactor exporter, AREVA, is so bedevilled by financial and technical setbacks it is no longer considered a major player in the reactor export business.<sup>8</sup> As for the Japanese and Koreans, their nuclear efforts are technically tied to continued technology transfers from the U.S. They are not going to undercut the U.S. on nonproliferation conditions. Finally, the Chinese have a multitude of reasons to avoid relying on the Russians, who they are more likely to have to compete with in the next three decades diplomatically, economically, and militarily. For all these reasons, and because China sees U.S. reactors both literally and figuratively as its safest bet, industry experts believe the Chinese will rely most on the AP 1000 series for domestic nuclear electrical production along with their own version, the CAP 1400.<sup>9</sup>

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8. See, e.g., Energy Collective, "AREVA Struggles to Dig Out of Debt," March 25, 2015, available at <http://www.theenergycollective.com/dan-yurman/2208496/areva-struggles-dig-out-debt>; John Lichfield, "UK Nuclear Strategy Faces Meltdown As Fault Are Found in Identical French Project," *The Independent*, April 18, 2015, available at <http://www.independent.co.uk/news/uk/home-news/uk-nuclear-strategy-faces-meltdown-as-faults-are-found-in-identical-french-project-10186163.html>; and Stephen Chen, "French Warnings on Nuclear Reactors Being Built in China's Guangdong," *South China Morning Post*, April 15, 2015, available at <http://www.scmp.com/news/china/article/1762861/french-warning-nuclear-reactors-being-built-guangdong>.

9. See, e.g., Steve Kidd, "Prospects for Nuclear Power Internationally after Fukushima," April 25, 2013, Buenos Aires, available at [http://ecc.ridigital.co.uk/wp-content/uploads/2013/05/Argentina-Seminar\\_0413.pdf](http://ecc.ridigital.co.uk/wp-content/uploads/2013/05/Argentina-Seminar_0413.pdf).

As for China's future nuclear weapons requirements, the jury is out. If relations with India, Russia, Japan and the U.S. go south, China may want many more nuclear weapons than it currently has or could quickly make. Luckily, we are not there yet.

### ***Conclusion***

This ought to be good news. It means the U.S. has leverage to condition the deal without unnecessarily antagonizing China or risking important sales. Moreover, by conditioning and slowing the riskiest aspects of this deal – the lax controls over reprocessing and nuclear transfers – the U.S. can buy time it needs to address the energy and security concerns of our closest East Asian allies -- Japan and South Korea – to head off what might otherwise be a dangerous, regional nuclear competition. Here, the modest steps outlined can head off the worst. Not taking them will invite it.