

Pakistan Deal Signals China's Growing Nuclear Assertiveness

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Contrary to guidelines adopted in 1992 by nuclear equipment supplier states in the Nuclear Non-Proliferation Treaty (NPT), China is poised to export two power reactors to Pakistan. This transaction is about to happen at a time when China's increasingly ambitious nuclear energy program is becoming more autonomous.

Guidelines of the Nuclear Suppliers Group (NSG), representing 46 NPT states, call on parties to the NPT not to supply nuclear equipment to non-nuclear-weapon states without comprehensive IAEA safeguards, including Pakistan. China joined the NSG in 2004.

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The United States and other NSG states may object to the pending transaction but they cannot prevent China from exporting the reactors. Senior officials in NSG states friendly to the United States said this month they expect that President Barack Obama will not openly criticize the Chinese export because Washington, in the context of a bilateral security dialogue with Islamabad, may be sensitive to Pakistan's desire for civilian nuclear cooperation in the wake of the sweeping U.S.–India nuclear deal which entered into force in 2008 after considerable arm-twisting of NSG states by the United States, France, and Russia. The United States may also tolerate China's new nuclear deal with Pakistan because Obama wants China's support for United Nations Security Council sanctions against Iran this spring.

China's Civilian Nuclear Industry On The March

The pending Sino–Pakistan reactor deal reflects the growing confidence and assertiveness of China's nuclear energy program as it establishes a track record of reliability in reactor construction and operation. Chinese nuclear entities are wary of interference from the International Atomic Energy Agency (IAEA) in their programs and are keen to establish their freedom of action vis-à-vis cooperating foreign governments and firms. China within a few years also wants to become a global nuclear equipment exporter.

If China succeeds, ten years from now it will likely become the world's second-biggest nuclear power generator after the United States.

After years of bilateral disputes over nonproliferation issues, in 1998 the U.S. Congress allowed a 1985 Sino–U.S. nuclear cooperation agreement to enter into force. After that, U.S. nuclear cooperation with China dramatically increased, culminating in China's 2006 selection of a consortium of companies led by Westinghouse to build four AP1000 power reactors in China. Westinghouse bested bidders from France and Russia in a competition set up by China to determine which of the three would provide the technology blueprint for the future standardized development of China's nuclear power industry.

China chose Westinghouse after it agreed to transfer to China ownership of the technology for the new and untried 1,000-MW reactor. China then awarded contracts to Westinghouse and its partners to build four AP1000s in China. The first two are scheduled to be finished in 2013. Westinghouse scored another coup when in 2008 China selected AP1000 for China's first raft of inland power reactors.

Westinghouse's apparent emergence as primus inter pares among foreign reactor vendors in China in 2006 was linked to the fortunes of the State Nuclear Power Technology Co. (Snptc). It was set up by China's State Council of Ministers to take charge of technology selection and transfer for China's future nuclear power program, after two decades during which China organized a handful of "boutique" reactor projects in cooperation with Canada, France, Japan, and Russia.

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Right now, China operates only eleven reactors representing about 9 gigawatts (GW) of installed generating capacity, but these have established a record of reliability, and have convinced China's leaders that nuclear power is safe, efficient, and profitable. Fed by galloping energy demand and concerns for global warming among Chinese leaders, China's appetite for nuclear power is now increasing. In 2005 China expected to have 40 GW on line by 2020. Chinese officials and executives now routinely assert that by 2020 China will have a total installed capacity over 70 GW. If China succeeds, ten years from now it will likely become the world's second-biggest nuclear power generator after the United States.

Shortly after China selected Westinghouse to shape its nuclear future, rival Areva made a separate deal with China to build two of its new EPR reactors in Guangdong Province in China's southeast, where French nuclear firms have been engaged since the late 1980s. Unlike Westinghouse, Areva also offered China a suite of fuel cycle technology options, and French officials hoped that a mammoth fuel cycle deal would coax China to continue building the EPR.

In line with plans by China to build more reactors, China promulgated that it would follow the path of France, Russia, and Japan and embark on commercial-scale plutonium separation from China's spent fuel, and recycle of the plutonium as reactor fuel. Areva offered China to help set up a reprocessing industry in China, modeled on its own experience in France. More recently, Russia has made a counteroffer to do the same, vowing to integrate Chinese labs into advanced fuel cycle R&D work now ongoing in Russian centers.

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China will certainly build more reactors than it anticipated when beginning in 2003 it organized the competition leading to selection of Westinghouse. But many or most of these set up this decade will likely not be AP1000s or EPRs but instead be based on the original French design built in Guangdong and now dubbed China Pressurized Water Reactor or CPR-1000. To meet China's higher targets for more nuclear capacity, China is now replicating these CPRs.

Rumors in Beijing circulated last month that China will therefore go back on its plan to permit Westinghouse to build all of the first group of inland power reactors in the country. Chinese officials won't confirm that, but utility executives—including at China Power Investment Corp. (CPI), a major AP1000 investor—said that China through 2020 will shift resources away from more AP1000s and instead toward cookie-cutter construction of the CPR at many Chinese locations, including at inland sites.

In the meantime, the ambitious construction schedule for the U.S.-designed reactors in China has come under heavy pressure.

In part out of Chinese concern to keep construction on track, China's nuclear regulator, the National Nuclear Safety Administration (NNSA), will not agree to a proposal, favored by the U.S. Nuclear Regulatory Commission (NRC) and Westinghouse, to modify the design of the containment structure of the AP1000 to provide improved protection against an air crash. In the United States, NRC, after a design review prompted by post-9/11 concerns about terrorist threats, asked Westinghouse to change the design of a shield building which is part of the containment and to use stronger materials. Westinghouse then urged China to also follow that advice.

China will not do that, Beijing officials said last month after consultations with Westinghouse and U.S. regulators. "China will build Revision 15," the AP1000 design version originally approved for construction in both the United States and in China, one official said. "It will not approve Revision 17," which incorporates the changes sought by NRC and Westinghouse, he said.

Changing the AP1000 design now would require construction in China to be halted and delayed. China also does not share NRC's view that a terrorist attack on reactors, using a hijacked passenger aircraft as a weapon, is a realistic enough scenario to warrant modifying the design.

The Westinghouse project has encountered other challenges which, so far, have not caused schedule delays. Last year, a key firm which is part of the technology transfer program, China First Heavy Industries (CFHI), failed to produce forgings to the required quality standard for the AP1000. Project executives said CFHI had difficulty handling the demanding steel material called for in critical components. The schedule was not set back because a Westinghouse partner in Korea, Doosan, had a stock of prototype forgings it had made earlier. The AP1000 has also encountered problems in main coolant pumps, which are of a unique design. Chinese officials said last year that further deployment of the AP1000 would depend on successful demonstration of these pumps, which were a critical feature of the passive cooling system billed as one of the key advantages of this reactor model. According to diplomats there have also been some Chinese bureaucratic delays for certain AP1000 project approvals.

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Nearly immediately after partnering with Westinghouse, Snptc demanded the U.S. firm aggressively localize AP1000 production at a pace Westinghouse would not agree to, including for safety reasons. Snptc and Westinghouse then compromised, but utility investors say that the AP1000 program cannot go fast enough to localize and at the same time supply China's growing nuclear power needs, and that China has continued to pressure Westinghouse to accelerate the localization program. Because production of

CPRs in China is already highly localized after about 15 years of Chinese experience, domestic politics in China favors building more of these reactors.

Snptc also wants Westinghouse to increase the power of the reactor to 1,400 MW and then to 1,700 MW, matching the EPR. According to Snptc last month the 1,400-MW design will be ready for construction by 2013. Many foreign executives are skeptical that schedule will hold up.

China's nuclear power program has become more aggressive, politically organized, and independent of its foreign partners in the wake of recent changes in China's decision-making structure. Those at the top of this pinnacle are now watching how Snptc delivers in tandem with Westinghouse.

Ten years ago Chinese central planners began looking at uranium as their chosen future fuel to meet breakneck demand for base load electricity. But Premier Zhu Rongji, who was skeptical, kept the lid on.

Under Zhu, who was replaced by Wen Jiabao in 2003, the biggest player in nuclear energy decision making was the China Atomic Energy Authority (CAEA), which answered to the Committee for Science, Technology, and Industry for National Defense (Costind), an organization which supervised all defense-related industry. Under Zhu, Costind and CAEA began losing power, especially after China in 1998 established the General Armaments Department (GAD), now one of four departments of the People's Liberation Army (PLA). As GAD's authority increased, Costind's and CAEA's diminished.

Two years ago, China set up a brand new organization to take command of China's energy policy, including nuclear policy, the National Energy Administration (NEA). It is headed by Zhang Guobao, who strongly favors nuclear power development and who is also Vice-Chairman of China's leading planning agency, the National Development and Reform Council (NDRC). NEA has largely supplanted CAEA, and it reports to Li Keqiang, China's First Vice-Premier, a likely successor to Wen Jiabao.

NEA—which is staffed by about 170 experts, including fewer than 20 responsible for nuclear matters—cooperates with NDRC on setting planning targets, but NEA decides which reactors will be built, at what sites, and which state-owned enterprises will get contracts. It, Chinese officials said last month, will favor construction of more CPRs, and will also support China's biggest nuclear SOE, the China National Nuclear Corp. (CNNC) with a total payroll of over 100,000, in exporting more reactors to Pakistan.

Possible Considerations in a China-Pakistan Deal

China has long assisted Pakistan's nuclear energy program. In 1991 CNNC contracted with the Pakistan Atomic Energy Commission (PAEC) to build Chashma-1, a 325 MW power reactor. It was finished and began operating in 2000.

In 2004, China joined the NSG. China then explained to the NSG that a longstanding framework agreement with Pakistan committed China to provide a second reactor, Chashma-2, more research reactors, plus supply of all the fuel in perpetuity for these units. Chashma-2 construction began in 2005.

Chashma-2 is scheduled to be finished in 2011. To keep CNNC at work in Pakistan thereafter, CNNC and PAEC negotiated terms for two 650-MW reactors, Chashma-3 and -4.

In 2006 Pakistan urged China to approve the new project but China was not keen to do so. Pakistan diplomats said then China was holding back because it was not clear that the U.S.-India nuclear cooperation deal would be approved by both governments and by the NSG.

Chinese officials said last month that export of the reactors to Pakistan would be justified in consideration of political developments in South Asia, including the entry into force of the U.S.-India deal and the NSG exemption for India.

After the U.S.-India deal was approved and India's NSG exemption entered into force without any Chinese objections in 2008, China's policy evolved to support demands by Pakistan for compensation, but China did not expressly advocate awarding Pakistan a broad exemption from NSG trade sanctions matching India's.

NSG country representatives last week said they expect that the Obama administration will accept a limited amount of additional Chinese nuclear commerce with Pakistan as a price for getting Chinese support on UN Security Council sanctions against Iran in weeks ahead. Some suggested that the United States would also enlist China in this regard to persuade Pakistan to drop its opposition to negotiation of a Fissile Material Cut-Off Treaty, which Pakistan has said it could not accept because the U.S.-India deal had tilted the nuclear balance in South Asia in India's favor.

As long as Pakistan resists outside initiatives which would limit the autonomy of its strategic nuclear program, and because China is believed to be hiding behind Pakistan in avoiding making a firm FMCT commitment in light of China's strategic dilemmas with the United States, it is doubtful whether China would have effective influence on Pakistani decisions to halt fissile material production.

Mindful that the NPT's 189 parties will convene a Review Conference on the status of the treaty in May, European diplomats told Chinese counterparts last month that the NSG will currently not agree to exempt Pakistan from NSG sanctions, regardless of Pakistan's demands for such a step during bilateral security talks with the United States.

Senior NSG diplomats said this month that they expect that soon after China has completed political and contractual arrangements for the reactor sale to Pakistan, China will inform the NSG of its planned transaction. The matter could then be taken up by the NSG as an agenda item or point of business at a future NSG meeting. So far no NSG meetings are scheduled in 2010 prior to an annual plenary meeting in New Zealand in late June.

The U.S. State Department, in line with its response to a 1998 reactor export from Russia to India, continues to hold that a new reactor export by China to Pakistan would be contrary to both NSG and U.S. policy, but whether the United States would record an objection at the NSG or encourage other NSG states to do so would be up to President Obama following interagency discussions and consultation with foreign governments including Pakistan and China.

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Chinese officials said last month that export of the reactors to Pakistan would be justified in consideration of political developments in South Asia, including the entry into force of the U.S.–India deal and the NSG exemption for India. Western diplomats said China would not strongly favor an NSG exemption for Pakistan matching India's because that would not additionally benefit Chinese industry and because Pakistan, compared to India, is a limited nuclear power market with far less infrastructure and far fewer financial resources.

China in 2004 did not claim that more power reactors after Chashma-2 would be “grandfathered” by the prior Sino–Pakistan nuclear accord, and China has argued instead that there are compelling political reasons concerning the stability of South Asia to justify the exports. China will therefore not justify the transactions on the basis of any confidential commercial agreements between China and Pakistan, NSG state representatives said.

Should any NSG party object to these Chinese exports, the NSG would have no recourse to prevent the transaction, because its guidelines are not legally binding, leaving a decision to abide by the guidelines up to each sovereign member state.

Notification by China of intent to export reactors to Pakistan will prompt an internal debate among NSG members over whether to “jointly reconsider their common safeguards requirements” under paragraph 5 of the NSG guidelines, because the Sino–Pakistan transaction came to fruition just two years after the United States, France, and Russia firmly pressured many supplier states to grant India a broad exception to NSG trade rules.

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In support of the U.S.–India deal, former IAEA Director General Mohamed ElBaradei in bilateral meetings with NSG states in 2007 and 2008 urged the NSG to eventually lift NPT sanctions against both Pakistan and Israel.

U.S. diplomats beginning in 2005 held out to Pakistan a distant promise that it would be exempted from the NSG safeguards requirements, but they weren't counting on having to make the hard choices faced by the United States concerning Pakistan and China on many fronts in 2010. Still, if the United States were not to register opposition to China's new exports, that would signal the United States under Obama was prepared to brush off an important nuclear nonproliferation norm on grounds of political expediency. Since NSG states are awaiting leadership from the United States on how to eventually respond to China's challenge of the rules, tacit U.S. acquiescence would seriously damage the NSG's credibility as a rule maker for nuclear trade.

A long term remedy could be provided—as Switzerland in 2008 suggested in explaining its approval of the NSG exemption for India—by making significant changes in the rules governing the world's nuclear nonproliferation and trade regime. But the breach created by the U.S.–India deal, which would be opened wider by Chinese export of reactors to Pakistan, will not be easily closed because, as stated by paragraph 16 of the guidelines, “unanimous consent is required for any changes in the guidelines.” In the meantime, as global nuclear trade surges, NPT suppliers will be encouraged to ignore the rules.