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Nuclear Power Expansion in China Stirs Concerns

By [KEITH BRADSHER](#)

SHENZHEN, China — [China](#) is preparing to build three times as many nuclear power plants in the coming decade as the rest of the world combined, a breakneck pace with the potential to help slow [global warming](#).

China's civilian nuclear power industry — with 11 reactors operating and construction starting on as many as an additional 10 each year — is not known to have had a serious accident in 15 years of large-scale electricity production.

And with China already the largest emitter of gases blamed for global warming, the expansion of nuclear power would at least slow the increase in emissions.

Yet inside and outside the country, the speed of the construction program has raised safety concerns. China has asked for international help in training a force of nuclear inspectors.

The last country to carry out such a rapid nuclear expansion was the United States in the 1970s, in a binge of reactor construction that ended with the Three Mile Island accident in Pennsylvania in 1979. And China is placing many of its nuclear plants near large cities, potentially exposing tens of millions of people to radiation in the event of an accident.

In addition, China must maintain nuclear safeguards in a national business culture where quality and safety sometimes take a back seat to cost-cutting, profits and outright corruption — as shown by scandals in the food, pharmaceutical and toy industries and by the shoddy construction of schools that collapsed in the Sichuan Province earthquake last year.

“At the current stage, if we are not fully aware of the sector's over-rapid expansions, it will threaten construction quality and operation safety of nuclear power plants,” Li Ganjie, the director of China's National Nuclear Safety Administration, said in a speech this year.

A top-level corruption scandal is already unfolding in the nuclear industry.

In August, the Chinese government dismissed and detained the powerful president of the China National Nuclear Corporation, Kang Rixin, in a \$260 million corruption case involving allegations of bid-rigging in nuclear power plant construction, according to official media reports. No charges have been reported against Mr. Kang, who is being held incommunicado for interrogation.

While none of Mr. Kang's decisions publicly documented would have created hazardous conditions at nuclear plants, the case is a worrisome sign that nuclear executives in China may not always put safety first in their

decision-making.

In contrast with its performance in industries like toys, China has a strong safety record in industries like aviation, which receive top-level government attention.

The challenge for the government and for nuclear companies as they increase construction is to keep an eye on a growing army of contractors and subcontractors who may be tempted to cut corners.

"It's a concern, and that's why we're all working together because we hear about these things going on in other industries," said William P. Poirier, a vice president for Westinghouse Electric, which is building four nuclear reactors in China.

Philippe Jamet, the director of the division of nuclear installation safety at the [International Atomic Energy Agency](#) in Vienna, said that China had welcomed foreign inspectors at its reactors and that "they show pretty good operations safety."

But he added that the international agency was concerned about whether China would have enough nuclear inspectors with adequate training to handle the rapid expansion.

"They don't have very much staff, when you compare their staff with how many they will need," Mr. Jamet said. The agency accepted a Chinese request to send a team of international experts to the country next year to assess staffing and training, he added.

In late October, Prime Minister [Wen Jiabao](#) ordered a quintupling of the safety agency's staff by the end of next year, to 1,000, according to United States regulators. Chinese officials did not respond to requests for confirmation.

China has two rival state-owned nuclear power giants: the China National Nuclear Corporation, mainly in northeastern China, and the China Guangdong Nuclear Power Group, mainly in southeastern China.

Western experts regard the Daya Bay nuclear power plant in Shenzhen, which mainly uses French designs and is run by China Guangdong Nuclear, as evidence that China can run reactors safely. A display case holds trophies the power plant won in global safety competitions.

China National Nuclear likewise cooperates with international inspectors and has had no reported mishaps. But its roots are in a government ministry with close ties to the former Soviet Union, making it more of an enigma to most Western experts, and the corruption case has added to their concern. China National Nuclear was on track to grow faster than China Guangdong over the next decade.

China National Nuclear has sought to hush up the case involving the arrest of its president, deleting from its Chinese-language Web site even the most minor news releases that mentioned Mr. Kang. In a faxed response to questions, China National Nuclear made no mention of Mr. Kang, but emphasized that its plants met international standards.

The arrest of Mr. Kang, a member of the Chinese Communist Party's powerful Central Committee, can be seen as evidence of China's seriousness about safety.

Today, China's nuclear plants can produce about nine gigawatts of power when operating at full capacity, supplying about 2.7 percent of the country's electricity. Three years ago, the government set a goal of increasing that capacity more than fourfold by 2020.

The government will soon announce a further increase in its targets, to 70 gigawatts of capacity by 2020 and 400 gigawatts by 2050, said Jiang Kejun, an energy policy director at the National Development and Reform Commission, the main planning agency.

Electrical demand is growing so rapidly in China that even if the industry manages to meet the ambitious 2020 target, nuclear stations will still generate only 9.7 percent of the country's power, by the government's projections.

Bringing so much nuclear power online over the next decade would reduce the country's energy-related emissions of global warming gases by about 5 percent, compared with the emissions that would be produced by burning coal to generate the power.

"For anyone concerned about carbon dioxide emissions, it's heartening, but it's only a piece of the puzzle," said Jonathan Sinton, a China specialist at the International Energy Agency in Paris.

China, which by most estimates overtook the United States in 2006 to become the largest emitter of greenhouse gases, is seeking sharp improvements in the energy efficiency of its economy.

But the economy is growing so fast that even if the country can meet its goals, total emissions will rise 72 to 88 percent by 2020, Mr. Sinton said.

The challenge for China is to build and operate its nuclear reactors without the equivalent of the Three Mile Island accident, in which a reactor core partly melted and released radioactivity, or the Chernobyl disaster in the former Soviet Union in 1986, the world's worst civilian nuclear accident.

China does not use the kind of reactor that exploded at Chernobyl. And engineers in China study the mistakes that poorly trained operators made at Three Mile Island.

Liu Yanhua, a vice minister of science and technology, said China believed that its nuclear industry would continue to grow safely.

"So far," Mr. Liu said, "there is no damage."

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