Nuclear safety lies in greater transparency

With ambitious expansion plans, China must work to create a robust and reliable nuclear regulatory system, says **Qiang Wang**.

China has restarted its aggressive nuclear-power programme after a 19-month suspension in the wake of the Fukushima accident in Japan. Almost half of the atomic reactors under construction worldwide are in China, and the country wants to triple its nuclear-power capacity in just 4 years — from 12.5 gigawatts in 2011 to 40 gigawatts in 2015 — a feat unlikely to be achieved anywhere else in the world.

As we approach the second anniversary of the Fukushima disaster, it is pertinent to ask whether China has learned any lessons from its great rival, Japan. Will the 28 reactors it is constructing be well run and properly regulated? Will they be safe? It is far from clear that they will.

China's nuclear expansion relies on generation III reactors, such as the Westinghouse AP1000 and the Areva European Pressurized Reactor (EPR). The industry promises that these models are safer because they put greater reliance on 'inherent' safety measures — for example, they do not require active pumps to maintain safe operation — but we must take these assurances on trust. Of greater concern, perhaps, is whether the Chinese business and construction system, in which corruption, shoddy work and cost-cutting often flourish, will sacrifice safety for speed.

What China needs to avoid is a repeat of the situation in 1998, when its home-made CNP-300 reactor at Qinshan had to be rebuilt because of defects in the welding of the steel vessel that contained the reactor.

Areva says that an EPR nuclear reactor can be built in China for about US$4 billion — 40% less than it costs in Europe — and in about 46 months, compared with 71 months in Europe. This is the same reactor that faced massive cost overruns and delays when attempted in Finland and France.

To date, the AP1000 reactors in the Zhejiang and Shandong provinces are the only commercial units worldwide. Of the four EPR units under construction worldwide, two are being built in China's Guangdong province. China seems to be the nuclear industry's living laboratory for generation-III reactor designs and construction.

This means that China should have the world's most rigorous regulatory system. However, the nation's industry rules and guidelines are a decade out of date, and the country has no coherent legal system to govern the use of nuclear energy. Furthermore, China has taken no effective action to reform and strengthen its nuclear regulations or its regulatory bodies in the wake of Fukushima. Regulatory failures in Japan turned the accident at Fukushima into a crisis. China's system is just as bad, if not worse.

Just like Japan's, China's ability to monitor and ensure nuclear safety is undermined by a cosy relationship between state-owned nuclear regulators and state-owned operators, as well as by a revolving door that allows staff to move frequently between government and industry. The nation's nuclear governance is fragmented and split between multiple agencies. Worse, the regulators are lower in the political pecking order than are the operators.

China's two main regulatory agencies, the National Nuclear Safety Administration and the National Energy Administration, are several steps removed from the ruling State Council. Yet the major nuclear utility companies — the China National Nuclear Corporation, the China Guangdong Nuclear Power Group and the State Nuclear Power Technology Corporation — report directly to the State Council. Thus, it is the operators, not the regulators, who will have the ear of those in power in the event of an emergency.

Had there been greater transparency and public participation in Japan's nuclear industry, then the closed community of the 'nuclear village' that dictated the nation's nuclear development would not have formed, and the Fukushima accident would perhaps have been averted. It is unclear how China avoids the conflict of interest that brought down Japan's nuclear policy-making.

CHINA'S **NUCLEAR** POLICY-MAKING **RELIES** TOO HEAVILY ON **CLOSED** EXPERT PANELS.

At present, China's nuclear policy-making relies too heavily on closed expert panels. And because most of the nuclear institutes in China are subsidiaries of nuclear utilities, the majority of the experts involved in evaluating proposals to build new reactors are affiliated with nuclear operations.

Like Japan, China does not yet foster transparency and public participation in its nuclear issues. The public is invited to comment on environmental-impact assessments of planned projects, but is given just ten days to do so, making thorough and independent evaluation of nuclear safety virtually impossible.

China needs nuclear energy to meet its energy demands and carbon-reduction targets. But it needs to do more to reform and strengthen its nuclear-safety system to match its expansion. It must aim for greater transparency and public involvement and set up independent nuclear institutes, giving them long-term financing to carry out independent nuclear research, especially on nuclear-safety software. But most urgently, China needs to set up a comprehensive legal framework to govern nuclear energy and give responsibility for reactor safety to an independent, credible and authoritative regulatory body. As dozens of nuclear construction sites across China whir into action again, one thing is sure: the nation has its work cut out to gain the trust of its people and of the world. ■

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Qiang Wang *is director of the Western Research Center for Energy and Eco-Environmental Policy at the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences in Urumqi. The views expressed are his own.*
e-mail: wang_q@ms.xjb.ac.cn