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China's Response to Nuclear Safety Post-Fukushima: Genuine or Rhetoric?

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The Fukushima crisis has brought the nuclear safety problem to the world's attention. There are three reasons why the study of nuclear safety in China is a key priority. First, China has been ambitiously pursuing nuclear power development over the last decade. Second, it is uncertain whether China's current institutional arrangement that oversees nuclear safety regulations, guidelines, and procedures, can provide an effective safety mechanism for such a mega project and prevent catastrophic nuclear accidents. Third, there are ongoing concerns about whether China's nuclear power plant (NPP) can meet the International Atomic Energy Agency (IAEA) safety standards.

With a population of 1.3 billion, how China perceives and responds to the nuclear safety carries significant implications for the safety and security of its people. This paper explores three key questions. First, what is the Chinese government's view towards nuclear safety following the Fukushima crisis? Second, what are China's actual responses to nuclear safety? Third, are these responses genuine or rhetoric?

Our analysis takes the following steps. First, statistical discourse analysis is applied to a large quantity of English news media texts to identify viewpoints over nuclear safety. The approach serves as an alternative means to deciphering the government's concern over

sensitive issues in circumstances where obtaining relatively objective data via interviews or official documents is rather difficult. Second, we investigate the actual safety performance and the governance of NPPs in China through safety performance and policy analysis. Finally, we assess whether China's response to nuclear safety is genuine or simply rhetoric, and propose areas for policy intervention and improvement.

Our analysis on news media texts reveals that the government's concern over nuclear accidents and safety surged significantly after Fukushima. The statistical discourse analysis demonstrates that nuclear accidents and safety have become the two high frequency words dominating the news corpora of nuclear power in China post-Fukushima. Moreover, after the Fukushima disaster, the phrase of 'nuclear power' is found to be increasingly associated with accidents and safety, whereas before the disaster it only associates with construction-related words. As the news media in China is a crucial channel for policy direction and promotion, our findings reflect the Chinese government's significant concern over nuclear safety.

Our analysis also shows that China has displayed strengths in reactor technology design and safety operation. China on the whole has been making good efforts to improve nuclear safety performance and has maintained a reasonably good safety record in NPP design and operation. China has attempted to purchase or develop safer and more advanced reactor technologies. All nuclear incidents occurred in China have been Level 0 or Level 1 incidents, the lowest and the second lowest level on the International Nuclear and Radiological Event Scale (INES), respectively. All operating NPPs have met the safety performance thresholds set by China's National Nuclear Safety Administration (NNSA), and some new nuclear reactors can achieve better safety performance well below the NNSA thresholds. Most operating reactors are required by NNSA to improve their site characteristics, safety management and emergency planning in some ways.

Finally, our analysis shows that China's safety governance is continuously challenged by

institutional fragmentation, inadequate transparency, inadequate safety professionals, weak safety culture, and ambition to increase nuclear capacity by three-fold by 2050. First, the responsibilities of these authorities sometimes overlap, making their roles and interaction in the decision-making process difficult to understand and challenging for public monitoring. Moreover, the regulation of nuclear safety lacks the independent verification of safety assessments and the equipment for on-site monitoring is insufficient. Second, even though China is eager to present a comprehensive and internationally recognized new nuclear safety plans, such plans are not available to the public, calling into question the government's commitment to improve information transparency and public participation. Third, safety management professionals and strong safety culture are urgently needed, both to meet the growing demands for nuclear safety operation and regulation, and to support China's aggressive nuclear expansion. Fourth, there is a delay in approval of new nuclear projects in the short term, but with increasing number of new nuclear plans in the near future.

To ensure that nuclear safety will top the Chinese government's priority in the long term, nuclear safety performance in China may require specific institutional reform and policy change. We suggest that China should standardize design and safety standards, strengthen nuclear safety management and emergency response by means of independent third-party inspection, reform regulatory structure to reduce institutional fragmentation, adopt a preventative approach towards nuclear safety regulation, improve information transparency and public participation, and strengthen the safety culture and international collaboration for capacity-building.

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