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Natural Hazards and Nuclear Power Plants: measures to minimize the risk of a nuclear accident

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In the aftermath of Fukushima natural-technological disaster the global opinion on nuclear energy divided even deeper. While Germany, Italy and the USA are currently reevaluating their previous plans on nuclear growth, many states are committed to expand nuclear energy output. In China and France, where the industry is widely supported by policymakers, there is little talk about abandoning further development of nuclear energy. Moreover, China displays the most remarkable pace of nuclear development in the world: it is responsible for 40% of worldwide reactors under construction, and aims at least to quadruple its nuclear capacity by 2020. In these states the consequences of Fukushima natural-technological accident will probably result in safety checks and advancement of new reactor technologies. Thus, China is buying newer reactor design from the USA which relies on advanced ”passive safety systems”.

Nuclear industry has drawn lessons from previous nuclear accidents where technological and human factors played crucial role. But the Fukushima lesson shows that the natural hazards, nevertheless, were undervalued. Though the ongoing technological advancements make it possible to increase the safety of nuclear power plants with consideration of natural risks, it is not just a question of technology improvement. A necessary action that must be taken is the reevaluation of the character and sources of the potential hazards which natural disasters can bring to nuclear industry. One of the examples is a devastating impact of more than one natural disaster happening at the same time. This subject, in fact, was not taken into account before, while it must be a significant point while planning sites for new nuclear power plants.

Another important lesson unveiled is that world nuclear industry needs advanced mechanisms of international oversight. The urgent necessity is to develop and adopt a joint mechanism for international consultation in case of serious accident at a nuclear power plant. It is necessary to work out the list of constraining provisions for building and operating nuclear plants in regions where potential risks of natural-technological catastrophes exist. These provisions should include risk estimate for every particular region, as well as the list of preventive measures to secure the safe operation of nuclear plants located at those sites. As it was stated before, the synergy effects of more than one potential hazard must be taken into account.

The main goal of my report is to represent possible methods for mitigating safety risks associated with natural hazards and technological disasters, review the effectiveness of existing oversight mechanisms, and encourage a cooperative discussion on these issues.

Keywords: Natural hazards, Technological disaster, Synergy effect, Nuclear energy policy, Safety risk evaluation