



**S. RAJARATNAM SCHOOL
OF INTERNATIONAL STUDIES**
A Graduate School of Nanyang Technological University

RSIS COMMENTARIES

RSIS Commentaries are intended to provide timely and, where appropriate, policy relevant background and analysis of contemporary developments. The views of the authors are their own and do not represent the official position of the S.Rajaratnam School of International Studies, NTU. These commentaries may be reproduced electronically or in print with prior permission from RSIS. Due recognition must be given to the author or authors and RSIS. Please email: RSISPublication@ntu.edu.sg or call 6790 6982 to speak to the Editor RSIS Commentaries, Yang Razali Kassim.

NUCLEAR ENERGY: Addressing the Not-in-my-Backyard Syndrome

Alvin Chew and Jor-Shan Choi

14 April 2009

The nuclear power states have not resolved the issue of permanent storage of nuclear spent fuel. Countries with existing nuclear facilities also face challenges to the temporary storage of their spent fuels. What can other countries adopting nuclear energy learn from the experiences?

SPENT FUEL storage in many countries using nuclear energy to generate electricity has become an intractable problem. The Yucca mountain in Nevada, United States was supposed to be a repository for nuclear waste. However, the decision by the Obama administration to forego this as an option has put a dent on the nuclear industry. Now many countries are buying time to see if any possible solutions could emerge to address the problem of spent fuel storage. But how much time have they got?

Technical or Political Challenges?

There are technological challenges. High level waste can be buried deep in the ground up to thousands of years in order for the radioactive waste to be stable. The site chosen for burial should ideally be in a region of stable geological activity. Furthermore, groundwater will have to be low so that water will not serve as a carrier for any radioactivity that could eventually surface as an environmental problem. A large permanent repository can be identified, but the freezing up of that land for thousands of years would require much convincing by the decision-makers because of the impact on future urban development. One can also be skeptical about the current model of projecting possible geological activities in the magnitude of thousands of years.

Reprocessing is another option in reducing the volume of the waste. In fact, the initial concept of nuclear power was to undergo the reprocessing stages so as to present itself as a sustainable form of energy. However, the weapon-grade Plutonium 239 recovered from the waste poses a security threat that now clouds the entire agenda of non-proliferation issues. The next generation of the fast breeder reactors will not arrive anytime sooner. Therefore, it would seem that technology can only present itself as a limited solution in a world engulfed with political issues.

The world will require a solution for the long term disposal of nuclear waste. Currently, countries are adopting longer than expected temporary storages of its spent fuel. Even then, the temporary storages of the spent fuel rods pose a problem for some nuclear power programmes like Taiwan's. With the expectation of nuclear energy growing in the coming decades, new entrants to the industry such as Vietnam and Indonesia -- although Jakarta may drop its plan for nuclear energy -- will have to deliberate carefully on how these issues can be resolved before embarking on their plans to adopt nuclear energy.

Regional Cooperation

The world needs to come up with a concrete plan for permanent repositories. Before that happens, countries now using nuclear energy will have to grapple with temporary storages. The temporary storage of spent fuel rods is initially in spent fuel pools and subsequently in dry cask containers. This poses a potential security problem in terms of radioactivity as well as possible attacks from terrorists. Such concerns have fermented the NIMBY (Not In My Back Yard) syndrome that has made nuclear power an unpopular source of energy. Indeed, the social resistance from the neighbourhood echoes sentiments of insecurity.

Regardless of statistical evidences and assurances by governing agencies on the overall safety achieved via improving technologies, society will inevitably be reticent about nuclear power plants in their vicinities. The problem is clearly socio-political rather than technical in nature. Therefore it is best dealt with using the appropriate instruments of diplomacy.

Various proposals have been put forward to establish temporary storage of spent fuels, including the possibility of vendors taking back the fuel for reprocessing or for storage. However, such proposals have yet to be translated into viable options, and in most situations, the recipient countries would have to account for their own nuclear spent fuel storages. Evidently, it is not very enticing for countries who want to pursue nuclear energy for their economic development to be deterred with the issue of waste storage.

If countries in the region can come together to deal with the temporary storage of waste, the move will certainly be welcomed as positive for confidence-building. The question now remains if the regional countries have the political will to engage in such cooperative mechanism.

The Southeast Asian Context: Time-Leasing

The ASEAN region is considered a new entrant to the nuclear energy industry. It will be watched by the international community if it can foster any mechanisms for cooperation in this area. Certainly, its vast geological profiles call for countries to come together to address the technical issues of nuclear power plant and waste storage locations. Owing to their close proximity to one another, having nuclear power facilities is not just an issue for individual countries but a regional one as well.

In the context of temporary storage of spent fuels, regional countries can explore the concept of time-leasing for possible sites until a permanent repository is being constructed. Such a move would send a message to overcome the NIMBY mindset. It allows countries in the region that do not have the nuclear plants to also participate in the temporary storage of nuclear wastes. The technology has proven it to be safe. With the right governance and a lucrative business model, regional storage of nuclear spent fuel could become essential for ASEAN countries pursuing nuclear power development.

Alvin Chew is Research Fellow at the S Rajaratnam School of International Studies at the Nanyang Technological University, Singapore. Jor-Shan Choi is a Professor with the Global Centre of Excellence Programme at the University of Tokyo.

