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

RSIS COMMENTARIES

No. 53/2011 dated 6 April 2011

Nuclear Power After Fukushima

By Barry Desker

Synopsis

Japan's nuclear crisis triggered by the recent earthquake and tsunami has raised fundamental questions about the future of the global energy industry and energy security.

Commentary

THE TSUNAMI which crippled the Fukushima Daiichi nuclear power plant on March 11 2011 unleashed fears of massive radiation in the surrounding Japanese countryside. While the Japanese government has established a 20 kilometre exclusion zone around the plant, many governments have advised their citizens to keep at least 80 kilometres away.

Although the earthquake and tsunami probably took more than 25,000 lives and has caused the displacement of thousands more, world attention has been focused on the dramatic efforts to prevent a nuclear meltdown. The mood in Japan has shifted against the use of nuclear energy and Prime Minister Naoto Kan has shied away from clarifying whether Japan will proceed with the earlier planned construction of 14 nuclear plants.

China has delayed the construction of new nuclear reactors, the ruling Christian Democrats in Germany lost an important state election over the nuclear issue and Southeast Asian states which were once eager to climb on the nuclear power bandwagon have begun re-thinking their stance on the issue. France is pushing for international standards on nuclear safety. These developments occur even though there have been only two fatalities so far from radiation leaks in Fukushima.

Shifting Oil Trend

The Fukushima incident took place when it appeared that the nuclear power industry was on the cusp of a period of growth. Increasingly, states appeared to be turning more to nuclear power in an era of rising fuel prices, concerns about the greenhouse gas effects of fossil fuels and a slowdown in production of hydrocarbons. Even in our part of the world, crude oil production has declined. Production levels in Malaysia and Brunei have flattened and Indonesia has become a net importer.

There is a growing concentration of production, especially in the Middle East, with Saudi Arabia, Iran, Kuwait, the United Arab Emirates, Iraq and Russia set to account for almost 40 per cent of global oil production by 2025. Increasingly, these oil and natural gas resources will be controlled by national oil companies rather than multinational oil companies. One fear of consumers is that such companies will be more responsive to domestic political imperatives than price signals.

This wariness of being held hostage to external policy decisions has led to the revival of interest in nuclear power in the past decade. The current generation of nuclear power reactors have lower costs of power generation, vastly improved safety features and state of the art waste and proliferation management capabilities. With rising electricity prices, these nuclear power plants are economically competitive. Even land scarce Singapore is studying the long term feasibility of nuclear energy.

Back to Oil and Gas?

However, the issues raised by the Fukushima disaster are likely to result in a slowdown in current plans for the expansion of nuclear power generation, especially in the West. The exceptions are likely to be in Russia and China. Their governments will be less influenced by domestic pressures centred on fears about the safety of nuclear power. They will be more concerned about the need for cleaner fuels and about greenhouse gas emissions as they face increasing pressure at international negotiations on climate change. India, Brazil and Southeast Asia are likely to follow their lead, despite the cautious initial reactions of these states to developments in Fukushima.

After Chernobyl, it took more than a decade for proponents to revive interest in nuclear power as a source of overcoming the risk of rising energy insecurity. As it takes 15-20 years to ramp up nuclear power generation owing to the lead time required for the commissioning of nuclear power plants, the delay arising from Fukushima will mean that nuclear power is likely to be a significant factor in electricity generation only after 2030.

This highlights the continuing global dependence on oil and natural gas and the search for ‘clean’ coal and other alternative technologies. Russia’s emergence as an energy superpower will grow as it possesses the largest global reserves of natural gas, together with Iran and Qatar. It also has one of the world’s largest recoverable coal reserves. Elsewhere, energy insecurity will be the catalyst for technological innovation. The United States and China will lead the way in pioneering the development of clean coal technologies and carbon capture and storage. Alternative energy sources such as biofuels will attract increasing attention. But there will be a need to move beyond the current generation of food-based biofuels which have resulted in rising food and commodity prices.

Search for Energy Resilience

The challenge will lie in reducing the lag between technological breakthroughs and their adoption commercially. In the energy sector, it has taken about 25 years for new technologies to be widely available. For example, natural gas technologies have been widely available since the 1970s but natural gas has only slowly emerged as a competitor for oil-based fuels. High costs of investment and the sunk costs of plant and equipment represented by existing technologies have been a deterrent in the adoption of new technologies.

The ongoing nuclear crisis in Fukushima has focused attention once again on the challenges posed by the desire of states to enhance their resilience against volatile petroleum prices and their quest for energy independence. While nuclear power is now much safer, the public imagination globally is captured by the negative impact of scenes of refugees from the Fukushima locality and billowing smoke from the nuclear plants as well as reports of land and sea water contamination.

The pressure will grow for technological adaptations and mitigation measures which could reduce the need to rely on a nuclear power alternative.

Barry Desker is Dean, S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University.