Practice Note
ASEAN's Role in Shaping Nuclear Security Future in the Region

Mutti Anggitta *Bina Nusantara University, Indonesia*

Abstract

The objective of this essay is to discuss the potential future of nuclear security in Southeast Asia by examining the roles of the Association of Southeast Asian Nations (ASEAN) in establishing and maintaining regional cooperation on nuclear security. This essay will first outline nuclear renaissance and security challenges in the region. It will then discuss the steps that have been taken and could be taken by ASEAN to lead the region to a safer nuclear security future.

Key words: nuclear security, ASEAN

Introduction

The last session of Nuclear Security Summit (NSS) held last year was not very successful. Similar to the three previous sessions, the last NSS only produced a toothless joint communiqué urging the participating states to maintain effective security of all nuclear materials, without a legally binding agreement. Also, only 19 out of the 56 participating states pledged to join some form of successor nuclear security conference in 2018. The NSS was initiated by the U.S. President Barack Obama during his famous 2009 Prague speech, and largely driven by the U.S. However, he had left the White House. Will his successor, President Donald Trump, make nuclear security a continuing priority? If not, what will happen to international cooperation on nuclear security, especially in Southeast Asia where 'nuclear renaissance' meets a number of serious security challenges?

The objective of this essay is to discuss the potential future of nuclear security in Southeast Asia by examining the roles of the Association of Southeast Asian Nations (ASEAN) in establishing and maintaining regional cooperation on nuclear security. This essay will first outline nuclear renaissance and security challenges in the region. It will then discuss the steps that have been taken and could be taken by ASEAN to lead the region to a safer nuclear security future.

Nuclear Renaissance and Security Challenges in Southeast Asia

The interest in nuclear energy is not new to Southeast Asian nations. It was promoted by the U.S. in 1953 through the Atoms for Peace program. However, the development of nuclear energy has been difficult since the region is not only subject to large-scale and frequent natural disasters, but has also faced various political, financial, and technical difficulties. This may explain why the four

Journal of ASEAN Studies, Vol. 4, No. 2 (2016), pp. 178-182
DOI: 10.21512/jas.v4i2.1950.g1741
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ISSN 2338-1361 print / ISSN 2338-1353 electronic

projects to construct nuclear research reactors (two in Indonesia, one in Thailand, and one in Myanmar) and one project to construct a nuclear power plant in the Philippines were canceled since 1971 (CNS, CENESS, and VCDNP, 2012).

In spite of previous interest, Southeast Asia has just recently put nuclear energy in its main agenda. There are currently sixteen projects to construct nuclear power plants by 2025 in the region: six in Vietnam, four in Indonesia, four in Thailand, and two in Malaysia (CNS, CENESS, and VCDNP, 2012). The reason behind this 'nuclear renaissance' in the region is potentially because Southeast Asian countries, just like any other countries in the world, want to fulfill their domestic energy needs and to ensure their energy security. Between 2000 and 2013, the region's energy demand has increased by approximately 50%. Studies by IEA and ERIA (2015) show that the region's total electricity generation will almost triple, from 789 terawatt-hours (TWh) in 2013 to approximately 2,200 TWh in 2040. Indonesia, Malaysia, Thailand, and Vietnam seem to have been driven by the rising electricity demand and growing dependence on fossil fuels to consider restarting the postponed or starting new nuclear power plant projects.

After the 2011 Fukushima incident, there was much uncertainty about the future of nuclear industry in Southeast Asia. Public rejection has been apparent especially in Indonesia, Malaysia, Thailand, and the Philippines, but not in Vietnam. There is no major public protest against the nuclear power plant program in Vietnam, a country with single-party rule where freedom of speech is very limited, if not non-existing. Vietnam was progressing much faster than other countries in the region in developing its nuclear power plant program. In fact, it aims to start construction of a Russian-supplied nuclear power plant in 2019 (WNA, 2016). However, in November 2016, the National Assembly of Vietnam voted to halt its nuclear power plant program due to economic reasons. If the halt is to be temporary, and Vietnam's nuclear project runs smoothly and successfully becomes a part of the country's energy mix, then other states in the region may even follow Vietnam's lead.

Although currently there is no nuclear power plant in operational in Southeast Asia, several countries in the region possess and use highly enriched uranium (HEU) and other radioactive materials for various purposes as can be seen in **Tables 1** and **2** (CNS, CENESS, and VCDNP, 2012).

Considering the increased flow of nuclear and radioactive materials in Southeast Asia, not to mention the security challenges the region is facing, it is crucial for the region to have a strong nuclear security. There are at least three main security challenges in the region. Firstly, the region is home to a number of active terrorist groups, such as Jemaah Islamiyah, Jemaah Ansharut Tauhid, and Abu Sayyaf, not to mention several radical groups and clerics that have pledged their allegiance to the Islamic State of Iraq and Syria (ISIS). Fortunately, they have not shown a serious interest to use nuclear or radiological materials in their attacks. There is also little evidence that they have the capacity and the capability to mount mass casualty attacks (Liow, 2016). However, this situation may change in the future. There is a rising fear that ISIS is pursuing radioactive materials for its attacks, since it has been known in November 2015 that some of the group's

operatives have been spying on a senior official of SKN-CEN, a Belgian nuclear research center (Bunn et. al., 2016).

Table 1. HEU in Southeast Asia

Country	Quantity, U-235	Form	Use	Status
Indonesia	Gram quantity	HEU targets, 93% U-235	Between 1996 and 2008, Indonesia produced Mo-99 from HEU fission product mainly for domestic consumption, and for export to Bangladesh and Malaysia.	Since 2008, Indonesian reactors have produced Mo-99 from LEU foil target, as part of the U.S. Reduced Enrichment for Research and Test Reactors Program (RERTR). HEU irradiated targets were repatriated to the United States.
Philippines	3 kg	Nuclear fuel for research reactor, 93% U-235	The U.S. shipped a total of 3,3 kilograms of HEU to the Philippines in 1967. The material was for use as a fuel in the Philippines Research Reactor (PRR-1).	The HEU was returned to the United Sates (SRS, Aiken, SC) in April 1999 as part of Removed U.S. DOE Foreign Research Reactor Spent Nuclear Fuel Acceptance (FRRSNF) Program.
Thailand	5 kg	Nuclear fuel for research reactor, 90% U-235	The U.S. shipped 5,3 kilograms of HEU to Thailand in 1962. The material was for use in the TRR-1/ M1 TRIGA Mark III research reactor.	The HEU was returned to the United States (SRS, Aiken, SC) in April 1999 under FRRSNF program.
Vietnam	N/A	Nuclear fuel for research reactor, Enrichment N/A	The U.S. shipped an unknown quantity of HEU to Vietnam in 1963-1967. The material was for use in the Dalat Nuclear Research Reactor (DNRR).	In April 1975, shortly before the end of U.S. involvement in Vietnam, the fresh and irradiated HEU-nuclear fuel was shipped back to the United States.
	5.3 kg	Nuclear fuel for research reactor, 36% U-235	With Soviet assistance, Vietnam reconstructed the DNRR in the early 1980s. The first criticality of the reconstructed reactor was achieved on 1 November 1983. The core was loaded with VVR-M2 fuel assemblies with 36% enrichment.	4.3 kg of fresh HEU-fuel (about 1,4 kg of U-235) was returned to Russia in September 2007. The reactor was fully converted for LEU use by December 2011. Repatriation of irradiated HEU-fuel is scheduled for late 2013 as part of a joint U.S., Russian and IAEA Program on Russian Research Reactor Fuel Return (RRRFR).

Table 2. Use of Radioactive Materials in Southeast Asia

Applications	Brunei	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Thailand	Singapore	Vietnam
Irradiators	N/A	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Nuclear medicine	N/A	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Radiodiagnostic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Radiotherapy (Teletherapy, Brachytherapy, eye applicator)	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cyclotron Facility	N/A	N/A	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes
Industrial radiography (NDT)	Yes	Yes	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes
Industrial gauges (Well logging/moisture gauges)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Research reactor	No	No	Yes	No	Yes	No	Yes*	Yes	No	Yes
Neutron generator/Isotope production	N/A	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Waste storage facility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Philippines has research reactor but not in operation. Slightly irradiated fuel rods remain on the PRR-1 reactor site (as of 2009).
N/A = Information not available.

Secondly, Southeast Asia has very long land and sea borders, but weak border security capabilities. This makes states in the region targets for illicit arms, drugs, and human trafficking networks. Weak border security may also facilitate the illicit transfer of nuclear and radiological materials. On 13 June 2003,

the Royal Thai Police arrested Narong Penanam, who smuggled some amount of Cesium-137. Such material has long been high on the list of security-critical isotopes. A similar incident also took place in other region just a few weeks before the smuggling incident in Thailand. The police discovered two metal containers of Cesium-137 and Strontium-90 in Georgia (Ferguson and Andreoni, 2003). These trafficking incidents indicate that smugglers are interested in Cesium-137, a radioactive material that can be used to develop a radiological dispersion device (RDD), also known as 'dirty bomb.'

Thirdly, Southeast Asia has insufficient export control of dual use commodities. Studies by CNS, CENESS, and VCDNP (2012) show that the A. Q. Khan network was active in or had links to Indonesia, Malaysia, and Singapore. The network employed several firms in the region to produce centrifuge parts for Libya's nuclear weapons program. The network also transferred sensitive commodities through several ports in the region. Lieggi (2016) also notes that besides the A. Q. Khan network, Iran and North Korea have also used ports in the region to obtain dual-use commodities. Since the region is experiencing nuclear renaissance, the flow of dual-use commodities is increasing and likely to continue to grow in the future. States in the region potentially can no longer afford to ignore the importance of creating and implementing sufficient export control enforcement. It is just logical to think that an improved export control of dual use commodities is strongly needed in the region.

ASEAN's Roles – Steps Already Taken

Southeast Asia has an established framework for cooperation through ASEAN and its subsidiary bodies. They have been serving as the primary forum for all ten member states to address and manage regional hopes and concerns. In terms of nuclear security, the regional grouping has not considered the issue as one of its main priorities. However it has developed a number of mechanisms that could serve as a model for cooperation on nuclear security.

ASEAN has created a considerably useful mechanism for cooperation on counter-terrorism and transnational crime in the region. During the 7th ASEAN Summit on 5 November 2001 in Bandar Seri Begawan, ASEAN heads of state adopted the Declaration on Joint Action to Counter Terrorism, which underscored their commitment to combat terrorism in the region (ASEAN, 2012a). In April 2002, the ASEAN Ministerial Meeting on Transnational Crime held a special discussion about proposals on information sharing and training of counter-terrorism staffs. These efforts did not focus on nuclear security issues, but they covered customs and border control issues as a part of the wider scope of counter-terrorism and transnational crime activities (ASEAN, 2012b).

In 2007, ASEAN finalized a significant security cooperation agreement for the region during the 12th ASEAN summit. The heads of state signed the ASEAN Convention on Counterterrorism (ACCT), which serves as a framework for regional cooperation to counter, prevent, and suppress terrorism and deepen counter-terrorism cooperation. The ACCT also aims to strengthen preparedness for dealing with chemical, biological, radiological, and nuclear (CBRN) terrorism. After the ratification of six member states, the ACCT came into force in May 2011, and it has been ratified by all ten ASEAN member states since January

2013. Under the ACCT, ASEAN member states must take measures not only to secure materials that can be used to develop CBRN weapons and their delivery system, but also to improve export control enforcement, as well as to prevent CBRN proliferation (ASEAN, 2012b). This seems to be in line with efforts related to the implementation of United Nations Security Council Resolution (UNSCR) 1540, which imposes binding obligations on all UN member states to adopt legislation to prevent the proliferation of CBRN weapons including their means of delivery, and establish domestic controls over related materials to prevent their illicit trafficking (UN, 2004).

Another mechanism used by ASEAN to discuss security matters in the region is the ASEAN Regional Forum (ARF). Many experts believe that the forum is the most appropriate instrument for regional initiatives related to nuclear security issues (CNS, CENESS, and VCDNP, 2012). This forum was established in 1994 and aims "to foster constructive dialogue and consultation on political and security issues of common interest and concern; and to make significant contributions to efforts towards confidence-building and preventive diplomacy in the Asia-Pacific region" (ARF, 2016). The forum does not only consist of all ten member states, but also ten ASEAN Dialogue Partners (the U.S., Australia, Canada, China, India, Japan, South Korea, Russia, New Zealand, and European Union), Papua New Guinea, Mongolia, North Korea, Pakistan, East Timor, Bangladesh, and Sri Lanka.

On 2 July 2004, the ARF made its first statement on nonproliferation and encouraged its participants to improve domestic control of weapons of mass destruction (WMD) related materials, to cooperate on the prevention of illicit trafficking of WMD related materials, and to provide technical assistance when possible towards these ends (ARF, 2004). Within the ARF, there are inter-sessional meetings, which discuss specific issues of importance to the region every year. One of them related to nuclear security is the Inter-sessional Meeting on Nonproliferation and Disarmament (ISM-NPD). This forum discusses nonproliferation, disarmament, and arms control issues in the region, as well as challenges in implementing the UNSCR 1540 implementation. In July 2010, the Hanoi Plan of Action (PoA) was adopted during the ARF meeting in Vietnam. According to the PoA, by 2020 the ARF should establish a network of law enforcement and military agencies for information sharing and capacity building to respond terrorist threats timely (ARF, 2010). Given the transnational nature of security challenges in the region, the ARF is potentially an essential forum for discussions about coordinated policies on nuclear security issues.

ASEAN's Roles – Steps Can Be Taken

The ASEAN's cooperative framework known as the ASEAN Security Community (ASC) can provide a basis for facilitating nuclear security cooperation. Since all member states possess various radioactive materials and there have been a number of radioactive trafficking incidents in the region, it seems logical and wiser to put more attention on how to secure radioactive materials and how to respond to such radioactive incidents. Moreover, considering that the majority of nuclear power plant programs in the region are still in the early development phase, there is a great opportunity to establish an effective nuclear security culture in the region.

In establishing an effective and a strong nuclear security culture in the region, it is perhaps useful to have ASEAN Nuclear Community as the fourth pillar of ASEAN Community. Such forum can serve as a center for all member states to share information, knowledge, and experiences regarding nuclear safety and security issues. This forum can also serve as a coordinating instrument, including coordinating training programs for nuclear specialists, professionals, academia from all member states. Although individual member states in the region have their own domestic situations, it is important for them to engage with each other and increase their commitment to securing nuclear and radioactive materials due to the transnational nature of nuclear security challenges in the region.

About the Author

Mutti Anggitta received her bachelor's degree in International Relations from University of Indonesia and M.A. in Science and Security from King's College London. She is a member of the International Nuclear Security Education Network (INSEN) and a Certified Nuclear Security Professional (CNSP) with Specialization in Science and Engineering for Nuclear Security.

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