INSTITUTIONAL AND POLICY ISSUES FOR NUCLEAR COOPERATION SCHEMES IN THE ASIA-PACIFIC REGION

Tatsujiro Suzuki, Tomoyuki Tanabe
The Central Research Institute of Electric Power Industry, Japan

ABSTRACT

The Asia-Pacific Region, in particular East Asia and South Asia, is the only area in the world where nuclear power is expected to grow consistently in the coming 20 years. On the other hand, it is argued that most of the countries with civilian nuclear programs have had either nuclear weapons programs or at least had intentions to manufacture nuclear weapons. In this respect, there are growing needs for ensuring both nuclear safety and non-proliferation in the region. In the last few years, there have been various proposals calling for a regional nuclear cooperation scheme, often called as "Asiatom" or "Pacificatom". This paper is intended to analyze institutional and policy issues for establishing such a regional organization by reviewing past experiences of similar regional cooperation bodies, current various proposals, and by reviewing key countries' policies.

INTRODUCTION

At present, East Asia is the only region in the world where steady expansion of nuclear power is expected. As of 1995, total global nuclear capacity is 344 GWe while its capacity in Asia (including South Asia) is 57 GWe which is about 16% of world total. But by 2010, the nuclear capacity in Asia is expected to increase to 121 GWe, exceeding North America (108 GWe) and about equal to Western Europe (129 We). The Asian share in the world nuclear capacity will increase almost to 30%. Most of such growth comes from three countries, Japan, S. Korea and China.

Given this background, in the last few years, there have been number of proposals calling for a regional nuclear cooperation scheme for the Asia-Pacific region. The proposed concepts, often called as "ASIATOM" or "PACIFICATOM," are largely inspired by the successful regional schemes like European Atomic Energy Community (EURATOM). But there are significant differences and commonalties between Europe in the 1950s and current Asia-Pacific region Those differences and commonalties need to be carefully addressed in order to have successful regional cooperation. This paper, based on reviews of EURATOM and of various proposals, is intended to draw international implications for the possible nuclear cooperation scheme in the Asia-Pacific region.

LESSONS FROM EURATOM EXPERIENCES

Although a lot of proposals refer to the EURATOM as a possible model, many agree that there are significant differences between Europe in the 1950s and the Asia-Pacific region at present. But there are important lessons that can be learned from EURATOM experiences.

Based on the analysis of EURATOM experiences, the important conditions for a successful regional cooperative scheme are:

- Consistent with regional political and economic goals
- Visible benefits (economic, political and technical) for all members – clear and common goals

- Lack of existing international regime to achieve above goals[1]
- Potential benefits for non-member countries and other international regime – support from key stakeholders

There are also important unique features of EURATOM that should be noted as a reference for future ASIATOM concepts. They are:

- Coordinated R&D Activities
  Various R&D centers were established in member countries. It is important to note that material and technology transfer among R&D centers are, in principle, free, and researchers of member countries are given equal access to facilities and nuclear materials.
- Contribution to confidence building
  EURATOM contributed significantly to reduce regional concern among member countries, especially between France and Germany.
- Regional safeguards
  EURATOM regional safeguards, mostly modeled on U.S. bilateral safeguards requirements, have some unique features that International Atomic Energy Agency (IAEA) safeguards don't have. For civilian nuclear programs, EURATOM safeguards can be applied to all member countries including Nuclear Weapon States (NWS) [Article 81][2]. In addition, host countries cannot reject inspection teams because of nationality of inspectors. In other words, regional safeguards system can act as mutual inspection scheme.
- Legal ownership of fissile materials
  The EURATOM Treaty gives "the Community" the legal ownership of special fissile materials (plutonium-239, uranium-235 and uranium-233) [Article 86]. The treaty also gives the Commission the title to require that "any excess special fissile materials recovered or obtained as by-products and not actually being used or ready for use shall be deposited with the Agency or in other stores which are or can be supervised by the Commission." [Article 80]
- US influence ends at the Border
  Free material and technology transfer is allowed within the region. Member countries do not need US prior consents for reprocessing, enrichment and plutonium use.

UNIQUE CONDITIONS OF CIVILIAN NUCLEAR PROGRAMS IN THE ASIA-PACIFIC REGION

It is important to understand that political and economic conditions in the Asia-Pacific region are significantly different from those in 1950s in Europe. The Cold War is over and security relationships among the countries in the Asia-Pacific region have become more complex. While there is an increasing momentum within Asia toward economic and political integration, such as the establishment of APEC (Asia Pacific Economic Cooperation), that framework is much more flexible and loose compared with the European Community.

---

[1] At that time, international safeguards system had not been established by the International Atomic Energy Agency (IAEA).

[2] On the other hand, under the Nuclear Non-Proliferation Treaty (NPT), NWS have no obligation to accept IAEA safeguards.

In addition to this, the global nuclear non-proliferation regime, centered on the NPT, is much more secure compared with the conditions in the 1950s. A significant reduction in nuclear arsenals between superpowers is expected, which would also bring new security threats dealing with surplus fissile materials from dismantled nuclear warheads.

Regarding the civilian nuclear power programs, we can find the unique conditions of civilian nuclear programs in the Asia Pacific region given below.

Differences in Development Stages

At present, Japan is the dominant country with the largest nuclear power program in the region, and is the only country with complete fuel cycle facilities including enrichment and reprocessing plants. Following Japan, S. Korea, The Island of Taiwan and China have significant nuclear power programs. India and Pakistan also have small commercial nuclear power programs. In the coming decades, Indonesia, Thailand, Vietnam, and N. Korea are the countries that are planning to introduce commercial nuclear power programs. On the other hand, other ASEAN countries such as Malaysia and Singapore do not have any firm plans to introduce commercial nuclear programs in the near future. Given those differences, it is natural that those countries have different needs and infrastructure for their nuclear programs.

More or less Countries have either Nuclear Weapons or had Intentions to Possess Nuclear Weapons

In East Asia, China is a nuclear weapon state and N. Korea has been suspected to have secret nuclear programs. In South Asia, India and Pakistan are not accepting full-scope safeguards and neither is a member of NPT. India exploded a nuclear device in 1974 and Pakistan is also reported to have secret weapon programs.

Conflicts among Key Nations

The bilateral relationships among those with nuclear power programs are not robust at all. India and China, India and Pakistan, North and South Korea, The Island of Taiwan and China, are good examples of such fragile relationships. In addition, mutual mistrust between Japan and its victim countries during the World War II (especially China and Korea) have not yet been completely resolved.

Given those unique conditions, it is critically important to consider very carefully the sensitive nature of nuclear relationships among the countries in the region. Lack of mutual understanding or lack of transparency in each nuclear program could generate unnecessary mistrust among them.

REVIEW OF VARIOUS PROPOSALS

Table 2 summarizes the basic schemes and concepts of various proposals for regional nuclear cooperation during the last year or so. Most proposals address generic needs and schemes, and only a few l discuss specific international schemes or arrangements

Table 1 Comparison of Various Proposals for ASIATOM Concepts

	Area of Cooperation								
	Promotion of peaceful use of nuclear power					Prevention of nuclear proliferation			
	Safety	Public Relation	Industry Co-operation	Spent Fuel Mgt.	Waste Mgt.	Regional Safe-guards	Pu Mgt	Non-Prolif. Export Control	Nuclear Disarm.
A	x		x	x	X	X		X	
B	x	x	x	x	x	x		x	X
C	x	x	x	x	x			X	
D	x		X (enrich)	x	x	(x)			
E	x		X						
F				x	X (R&D)			(x)	
G	X			X				X	
H	X			X	X	X	X	X	X
I	X			X	X	(x)	(X)	X	
J	X			X	X	X	X	X	
K	X		X (R&D)	X	X		X	X	
L	X			X	X	X	X	X	
M	x								

A: ASIATOM (Murata)
B: ASIATOM (Kaneko) - Treaty
C: PACIFICATOM (Kano) – Open Frame
D: R. Imai
E: T. Sakairi – Safety Center
F: A. Suzuki – Project basis
G: Uematsu
H: PACATOM (Manning)
I: W. Dircks
J: Regional Compact (Choi)
K: Y.M. Choi (KAERI)
L: J. Carlson (AUS)
M: ANSCO (KAIST)

There are items that address both themes such as spent fuel management and regional nuclear fuel cycle centers. By reviewing those various proposals, general conclusions can be drawn as follows.

- All proposals address nuclear safety and spent fuel (and radioactive waste) management as important issues to be addressed regionally.
- Differences in emphasis between various proposals exists.
- Step by step approach is preferred by most proposals, including flexibility in membership.
- Regional nuclear fuel cycle concept can be a potential area of cooperation or a source of conflict depending on the emphasis of proposal

We shall now look more carefully into the important areas of cooperation suggested by most proposals reviewed here.

Nuclear Safety

There are already a lot of existing activities focusing on nuclear safety. The Convention on Nuclear Safety, which was created after the Chernobyl accident, is one such good example. In Asia, the Tokyo Conference on Nuclear Safety in Asia was held in November 1996, proposed and sponsored by the Japanese government. The World Association of Nuclear Operators (WANO) is another major multilateral organizations devoted to improving nuclear safety. Therefore, it is important to identify what specific areas of cooperation has been proposed by those experts.

One specific proposal noted here is “Asian Nuclear Safety Centre” made by Sakairi (1997). His proposal lists specific areas that are not effectively covered by the existing organizations or international arrangements. Examples of areas of cooperation include: emergency aid; evaluation visits; and transfer of specific equipment needed to improve safety. In order to achieve these objectives, Sakairi proposes that the basic characteristics of the Asiatom organization should be “hybrid”, i.e. a non-governmental organization with full governmental support.

The “Asia Nuclear Safety Consultation Organization (ANSCO)” proposed by Korea Advanced Institute of Science and Technology (KAIST) (1997) also addresses the issue of nuclear safety in the Asian region. This proposal is the only one that a governmental organization has proposed concerning regional nuclear cooperation in the Asian region. The main purposes of ANSCO are promoting “discussion and consultation on nuclear safety related issue and implementation of cooperation programs,“ and guaranteeing “prompt and effective response and cooperation in nuclear emergency situation” in the area.

Promotion of Nuclear Power

This subject is increasingly important for many Asian nations, including Japan, S. Korea and Taipei, China where siting of new nuclear facilities is becoming extremely difficult. Although this is primarily a domestic issue, potential benefits of international cooperation in this field has been suggested by various experts. On the other hand, this is not necessarily an appropriate subject for countries where nuclear power is not considered the best alternative energy source.

Management of Back End of the Fuel Cycle

It is generally agreed that all civilian nuclear programs have had serious problems in managing the back end of the fuel cycle. In particular, the lack of any decision regarding the final depository of high-level radioactive waste in the Asia-Pacific causes an overflow of spent fuel stored either on site or at the reprocessing plant. Once the capacity runs out, the operator has no choice but to stop the reactor operation. This can be applied to all nations regardless of its policy whether spent fuel will be reprocessed or not. Therefore, spent fuel management is proposed as the first potential area of cooperation for both securing nuclear power operation and non-proliferation purposes.

However, potential conflicts may come up if plans for spent fuel storage assumes eventual reprocessing or even a partial reprocessing by some countries. Currently, such a decision by a country in Asia is controlled by the prior consent right defined by the bi-lateral agreements between recipient countries and supplier countries. Supplier countries (such as US, Canada, Australia) would be worried if regional spent fuel management schemes could reduce their influence over decisions on reprocessing by the recipient countries. If the regional cooperation scheme is designed to shield or weaken the U.S. influence over the decision on reprocessing and plutonium use, such a proposal would surely be the source of conflict.

Another important issue is what to do with spent fuels from frozen nuclear programs in N. Korea. Under the agreed framework signed by the U.S. and N. Korea, spent fuels would be removed from N. Korea to a third country. In addition, it is not decided yet what to do with spent fuels from two Light Water Reactors (LWRs) supplied by the Korean Peninsula Energy Development Organization (KEDO). It is a common interest for all nations in the region to find appropriate means to deal with those controversial spent fuels.

One specific proposal on this subject is aimed at avoiding international conflict is the one proposed by A. Suzuki (1996). He specifically proposed the establishment of the “East Asian Collaboration for Intermediate Storage (EACIS)” which is devoted only for spent fuel storage for a definite period. By not deciding the eventual fate of stored spent fuel, which can either be reprocessed or directly disposed of, this proposal is intended to avoid such conflicts among the interested nations.

Regional Safeguards and Enforcement

Regional safeguards can be modeled from an already existing scheme such as EURATOM or the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). Regional safeguards has several potential benefits to international community as well as to the region. First, it could supplement the International Atomic Energy Agency (IAEA) safeguards regime, which is facing an increasing burden of financial constraints. Second, it will enhance regional confidence among participating countries through mutual inspection. Third, it could strengthen the international management of fissile materials. For example, EURATOM supplier agency has a legal authority and ownership over plutonium. Such a legal framework over plutonium can reduce international concern over the possible risks of diversion plutonium stockpiles. On the other hand, it is important to keep in mind again that if it is poorly managed, it could increase the proliferation concern outside the region.

Research and Development

Some proposals have suggested joint or coordinated R&D activities for peaceful use of nuclear power. For example, R&D programs to develop the next generation of advanced nuclear reactors, including breeders, would be worth considering to satisfy long term energy security concern. In addition, internationalized R&D program could increase the transparency of research programs.

However, major conflicts could again arise if such programs put too much emphasis on plutonium and breeder reactors. One possible topic, therefore, should be to develop more proliferation resistant nuclear technologies. Both Japan and the U.S. have been involved in such research programs. Therefore, such a program could be an interesting area of collaboration.

A. Suzuki (1996) also proposed the establishment of an "East Asian Collaboration for Underground Research (EACUR)." The EACUR facility is devoted not for the purpose of final disposal, rather for the purpose of R&D of technologies needed for geological disposal of radioactive waste. Such collaboration does exist among US and Western Europe, but not among Asian countries yet. This is another potential area that all nations in the region can find useful.

POSSIBLE DESIRABLE FEATURES OF ASIATOM

Some of the proposals reviewed here are much more ambitious than just proposing a specific area of project. Proposals made by Murata (1997), Kaneko (1996), Kano (1995) and Choi (1996) are more comprehensive in nature, covering cooperation in peaceful use of nuclear power as well as in the area of nuclear non-proliferation and nuclear disarmament. Based on the reviews of those proposals, the desirable features of such comprehensive regimes can be summarized as follows;

- Non-discrimination among members
- Equal degree of transparency
- Legal enforcement is secured
- Addressing unique regional issues
- Flexibility in membership

IMPLICATIONS: NEED FOR CONFIDENCE BUILDING

Given those findings, important international implications can be drawn as follows.

- The complex and diversified characteristics of the Asia-Pacific region need to be recognized, which might lead the conclusion that "Asiatom" is likely to be significantly different from EURATOM.

- Careful assessment is still needed to clarify the limit and scope of existing bilateral and international schemes in order to identify the potential areas of cooperation or the needs for the Asiatom concept.
- The top priority at this moment among interested nations is to improve the mutual understanding of nuclear policy, and to improve mutual confidence among the nations in the region.
- There are potential areas of cooperation where common needs and interests exist, that would require a new institutional arrangement like Asiatom.

Based on the analysis above, there are four potential areas that can be considered as possible subject for the Asiatom concept.

- Nuclear safety: prevention of serious accidents (safety culture) and emergency preparedness.
- Waste (spent fuel) management: international cooperation to secure waste or spent fuel management.
- Improving public confidence: lack of public confidence in nuclear power technology is a common problem for all nations involved in civilian nuclear programs.
- non-proliferation: improving transparency and tighter control of surplus fissile materials.

CONCLUSION

If carefully crafted, Asiatom concept can bring significant benefits for both the peaceful use of nuclear power and nuclear non-proliferation. However, Asiatom concept could create another potential conflict among the interested parties that could harm the healthy development of nuclear power in the region and hamper international efforts to reduce nuclear proliferation risks. It is essential to start sincere dialogue among interested parties to improve both domestic and international confidence in nuclear policies in all nations in the region.

REFERENCES

Keneko, K. Interim Report of the Council on Nuclear Energy and Disarmament (CNED), “ASIATOM: A New Framework for Nuclear Cooperation in the Asia-Pacific Region,” June 1996.

Kano, T. “Economic Development of Asia and International Cooperation in Nuclear Power: Proposal for PACIFICATOM,” Symposium commemorating the seventh APEC ministerial meeting, November 18, 1995.

Murata, H. “Asiatom - A Personal View,” presented at the 30th Annual Meeting, Japan Atomic Industrial Forum, Tokyo, April 9-11, 1997.

Sakairi, T. “A Proposed outline of ‘Nuclear Safety Centre’ in the framework of Asiatom,” prepared for the “Japan-Indonesia Dialogue on Nuclear Cooperation in Asia,” March 1997.

Suzuki, A. “A Proposal on International Collaboration with Nuclear Power Development in East Asia,” prepared for the energy workshop of the Northeast Asia Cooperation Dialogue V, Seoul, September 11-12, 1996.

Imai, R. “A Call for Regional Cooperation in Nuclear Energy, “ Japan Review of International Affairs, Summer 1995, pp. 266-277.

Manning, R. “PACATOM: A Nuclear Cooperation Regime as Asian CSBM,” paper prepared for the spring 1996 meeting of the CSCAP international working group on CSBMs, Washington, DC, April 1996.

Dircks, W. “ASIATOM: How Soon, What Role, and Who should be the Participants?” paper prepared for the Japan-US Study Group on Non-Proliferation and Arms Control After the Cold War, cosponsored by the Carnegie Endowment for International Peace and International House of Japan, Tokyo, September 28-30, 1995.

Choi, J.S. “An East Asian Regional Compact for the Peaceful Use of Nuclear Energy,” prepared for the energy workshop of the Northeast Asia Cooperation Dialogue V, Seoul, September 11-12, 1996.

Uematsu, K. “Nuclear Energy Development and Regional Cooperation in Asian Region,” prepared for the 2nd PNC International Forum on Nuclear Non-Proliferation, Tokyo, November 19, 1996.

Choi, Y.M. “Nuclear Energy Development and Regional Cooperation in Asian Region,” prepared for the 2nd PNC International Forum on Non-Proliferation, Tokyo, November 19, 1996.

Carlson, J. “Nuclear Energy Development and Regional Cooperation in the Asian Region: Possible Steps For Regional Cooperation,” prepared for the 2nd International Forum on Non-Proliferation, Tokyo, November 19, 1996.

Cho, N.Z. “Asia Nuclear Safety Consultation Organization (ANSCO),” prepared for Northeast Asia Nuclear Energy Workshop, Beijing, China, December 6, 1997.