A Study on Strengthening the Export Competitiveness of Nuclear Technologies through Amendment of the ROK-U.S. Atomic Energy Agreement

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1. Introduction

There are 439 commercial nuclear power reactors operating in 30 countries, with 371.7GWe of total capacity as of August 2007 [1]. As the demand for electricity increases, the number of commercial reactors planned or under construction also increases, especially in developing countries. For instance, China will build 30 more nuclear units and increase its installed capacity to 40GW by 2020 [2]. The Chinese government has imported French, Canadian and Russian nuclear units and will continue to import advanced nuclear power equipment and technology. Therefore, this is an exciting opportunity to export nuclear power technologies to foreign countries such as China.

Korean nuclear power companies are facing intense competition from French, Russian, Canadian, US and Japanese companies and having some obstacles to become globally competitive. One of the obstacles is an uncompleted fuel cycle. In Japan, nuclear fuel cycle was completed through the amendment of the U.S-Japan Nuclear Cooperation Agreement in 1988. The ROK-U.S Atomic Energy Agreement has been also planned to be renewed by 2014. Therefore Japan-U.S Agreement is a good example for what should be prepared for negotiation with the US.

2. The ROK-U.S. Atomic Energy Agreement

In Korea, most of light water reactors in operation were designed by U.S companies and 31% of uranium enriched fuels is imported from USA. As a result, Korean nuclear industries and R&D are constrained by USA.

Table. 1. Capacity of national nuclear fuel cycle facilities [3]

Country	Facility				
			Fuel		
	Mining & Milling (t/U/a)	Conversion to UF_6 (tU/a)	Enrichment (10^3 SWU/a)	Fabrication (tHM/a)	Reprocessing (tHM/a)
Canada	14890	12500		2700	
China	840	1500	1000	400	
France		14350	10800	1585	1700
Japan			1050	1689	120
Korea, Rep. of				800	
Russian Federation	4200	30000	15000	2600	400
UK		6000	2300	1680	2700
USA	1150	14000	11300	3450	

According to the article VIII of the ROK-U.S. Atomic Energy Agreement, both parties must agree to alter or reprocess nuclear material received from the US. This means a prior consent for complete nuclear fuel cycle. For this reason, the R&D and industry related to the nuclear fuel cycle have been limited in Korea. The most important task is to obtain programmatic prior consent through the Amendment of ROK-U.S Atomic Energy Agreement that is to be renewed by 2014 [4].

3. The U.S-Japan Nuclear Cooperation Agreement

The negotiation in 1977 for operation of the Tokaimura reprocessing facility was the beginning of the amendment which was taken 10years. U.S and Japan barely narrowed down their difference on how to extract plutonium because the U.S. government was concerned about nuclear proliferation. The Japanese negotiation team, however, successfully reached a conclusion by introducing the concept of mixed storage instead of mixed extraction of plutonium.

During full-scale negotiation for amendment, the US demanded inclusion of new regulations of the Nuclear Non-Proliferation Act(NNPA) in the agreement. However Japan was adamant that peaceful uses of atomic energy and non-proliferation are compatible. The fact that Euratom[1] also ignored the same demands of the US made the Japanese assertion persuasive. The US had no option but to withdraw their demands, including direct investigation of plutonium storage facilities and no recognition of plutonium possession. The US negotiation team's primary goal which was introduction of new regulations was agreed but, it was also great advantage to Japan.

4. Factors Affecting US-Japan Negotiation

4.1 International regime

Factors that affected negotiation, between the US and Japan were nonproliferation regime, INFCE [2] and Euratom. One of the reasons Japan had an advantageous position in the negotiation was that they had complied fully with the nonproliferation regime, as well as friendly relation with Euratom. At that time, Euratom was pushing for more energetic peaceful use of atomic energy. Therefore, failure of negotiations between the US and Euraton became favorable for Japan. INFCE also concluded that the compatibility of both peaceful use of atomic energy and nonproliferation can be realized. Based on INFCE conclusion, Japan questioned the logic employed by the US to restrict the complete nuclear fuel cycle.

[1] European Atomic Energy Community
[2] International Nuclear Fuel Cycle Evaluation, which was carried out by the IAEA between 1977 and 1980

4.2 Process of Policy Decision

The Japanese government included all interest groups (the ministry of trade and industry, the ministry of education, nuclear committee, ministry of foreign affair, the science and technology administration and state department) during the policy decision, each having a different interest. All interest groups frequently adjusted different opinions on The Agreement. This limited policy decision choices, and eventually advantageously affected the agreement. According to the article, The Policy Decision Process of Negotiation between the US and Japan (2002), those who are involved in policy decisions try to protect their interest from foreign pressure. Consequently this may lead to strengthen counter plan [5].

4.3 Reset of Goal and Subject for Negotiation

Reset of subjects had an effect on weakening of U.S negotiating leverage during the negotiation. Through introducing mixed storage instead of mixed extraction, Japan obtained an agreement to operate the reprocessing facility. New subject suggested by Japanese team increased the number of the alternatives and gave the US team new headaches.

The US team's priority of goal was application of NNPA to nuclear activities in Japan. However, negotiation for amendment between the US and Japan was handled as a major subject and the US failed to attain predominance during the negotiation. Under these circumstances, it is natural that Japanese negotiation team achieved their object successfully. In other words, resetting goal and subject was affective way to take advantage at the negotiation table.

5. Conclusions

The Lee government aims to transform Korean expertise on nuclear power generation into an export industry. However, export competition among countries having nuclear technology is intense. Moreover, uncompleted fuel cycle is one of the weaknesses for oversea expansion.

The negotiation for amendment of the Atomic Energy Agreement which constrains fuel cycle R&D must be prepared at this time when the first negotiation for amendment was held last year. Therefore the procedure of negotiation between the US and Japan is well worth enough to study.

Safety of nuclear energy development, reactor stability, personal and international exchange and international cooperation are the factors enhancing negotiating leverage. As a country operating 20 NPPs, Korea has built up the trust international society steadily. Based on the international trust, Korea needs to enhance the negotiation leverage.

Participation of nuclear committee, cooperation between government agencies, nation diplomatic effectiveness and joint effort between academic experts and industrial circles should be internally enhanced. Especially the importance of the role of diplomatic experts who have deep knowledge of nuclear issue cannot be overemphasized.

At this time domestic nuclear power market has been saturated, Korean nuclear companies have to find solutions through oversea expansion. The Korean government also wants to amend The Agreement to enhance nuclear sovereignty and nuclear export competitiveness. R&D of nuclear fuel cycle must be out of constraints as soon as possible, otherwise it may fall behind in the nuclear technology race.

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