

Challenges and Steps Forward for Peaceful Uses of Nuclear Energy under the NPT

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1. Introduction

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT) is an international norm that defines nuclear-weapon States as those that have conducted nuclear tests prior to January 1, 1967, and otherwise requires non-nuclear-weapon States (NNWS) to undertake to use nuclear energy for peaceful purpose and not to acquire nuclear weapons [1].

In accordance with Article 4 of the Treaty, countries that have committed to use nuclear energy exclusively for peaceful purposes have an inalienable right to access the benefits of nuclear energy while fulfilling their non-proliferation obligations [2].

However, developing countries, especially non-aligned movement (NAM), urge full access to nuclear material and technology for peaceful purposes at the NPT review conferences. They express concern that growing restraint imposed by non-proliferation measures would become obstacles to implementation of the Article 4 [3].

This paper reviews the implementation of peaceful use of nuclear energy, one of three pillars of the NPT. It identifies issues arising from different views of the Parties to the Treaty on peaceful uses of nuclear energy under nuclear non-proliferation regime. Regarding these issues, this paper suggests two proposals as ways of promoting peaceful uses of nuclear energy while ensuring non-proliferation, to be discussed at the 2020 NPT Review Conference.

2. Implementation of Peaceful Uses of Nuclear Energy

The Parties to the NPT have sought to facilitate peaceful uses of nuclear energy and to address nuclear proliferation risks and threat to the environment and human health for the past 50 years [4]. This section contains a brief description and the latest consensus on three issues mainly addressed in the Main Committee III of the review conferences.

2.1 Export control

To prevent diversion of nuclear materials and technology from trading nuclear items, supplier countries have control over their nuclear export. They have established and implemented multinational export control regimes, such as Nuclear Suppliers Group (NSG) and Zangger Committee, to pursue joint actions with internationally agreed guidelines [2].

Under these regimes, supplier countries have tried to tighten export control for non-proliferation assurances while recipient countries regard it as an impediment to developing peaceful nuclear energy programs.

The final document of 2010 NPT Review Conference, which is the latest one adopted by consensus, urges all the Parties to ensure that their nuclear related exports do not directly or indirectly assist the development of nuclear weapons or other nuclear explosive devices. It also encourages the Parties to make use of multilaterally negotiated and agreed guidelines in developing their own national export control systems [5].

2.2 Access to Sensitive Technologies

The technologies for enrichment and reprocessing are fundamental to the development of nuclear weapons, but they can be used for nuclear fuel supply and disposal of spent fuel, which are important in peaceful uses of nuclear energy. Since the small potential for developing nuclear weapons may undermine the NPT regime, most NNWSs have difficulties to access these sensitive technologies after the enforcement of the Treaty.

The developing countries have claimed that the difficulties of their access violate the inalienable right described in the Article 4 of the Treaty. In the responses to the claims, NNWSs have taken measures to ensure access to nuclear fuel supply and disposal of spent fuel, which can be achieved from the sensitive technologies, while securing nuclear non-proliferation. One of the measures is the “Multilateral Nuclear Approach (MNA)” proposed by the Director General of IAEA in 2003. This excludes an individual country’s operation of enrichment and reprocessing facilities, but rather includes joint international management of and individual countries’ access to the facilities when they need [6].

The 2010 final document urges development and promotion of the approaches to establish mechanisms to enhance nuclear fuel supply and deal with the back-end of the fuel cycle, but to date, the MNA has not been realized [5].

2.3 Nuclear Security

After the collapse of Soviet Union and the 9.11 attack in the United States, however, a concern has been raised over proliferation of nuclear material and acts of terrorism against nuclear facilities, resulted in

international movement to strengthen nuclear security [8].

Considerable effort has been made to ensure that all the Parties using nuclear energy maintain appropriate levels of nuclear security in accordance with agreed international standards. If any country takes measures that do not meet the relevant standards, it could be vulnerable to malicious acts [9].

Such joint effort to strengthen nuclear security and physical protection of nuclear materials contributes to preventing theft, sabotage, and unauthorized access, and reducing proliferation risk of terrorists acquiring weapons-usable nuclear materials.

The 2010 final document encourages the Parties to maintain the highest possible standards of security and physical protection of nuclear materials and facilities and to apply the IAEA recommendations on the physical protection of nuclear material and nuclear facilities (INFCIRC/225/Rev.4 (Corrected)) and other relevant international instruments at the earliest possible date [5].

3. Steps Forward for Peaceful Uses of Nuclear Energy

There will be discussions to further reduce nuclear proliferation risks and expand peaceful uses of nuclear energy as before in the Main Committee III of the 2020 NPT Review Conferences. This paper suggests two proposals to make progress into the issues above addressing non-proliferation assurances in nuclear trade and access to the fuel cycle.

3.1 Introduction of Fall-back safeguards system in international nuclear cooperation

When a State withdraws from the NPT, its IAEA comprehensive safeguards agreement automatically terminates under the terms for duration of the agreement. It may result in creating a loophole in the safeguards system if the withdrawing State refuse to accept safeguards on nuclear items within its territory [10]. It means that any State with the intention to develop nuclear weapons would withdraw from the Treaty and be able to use nuclear materials and equipment transferred while it was a party to the Treaty without significant violation of international treaties.

The NSG recognized the loophole and adopted additional measures in 2005 to suspend nuclear transfers to countries that are non-compliant with safeguards agreements and invoke fall-back safeguards if IAEA safeguards are no longer applied on the item transferred. However, the risk still exists due to the uncertainty about how the NSG guidelines have been reflected in supplier countries' domestic laws.

To complement the existing export control system, it is essential for the suppliers to stipulate their right to apply safeguards on items transferred and derived in

nuclear cooperation agreements or contracts, and exercise it effectively. This is a key obligation of the suppliers in the international nonproliferation regime.

Securing recipient countries' commitments on accepting safeguards and suppliers' right of return will contribute to preventing malicious acts of withdrawing states from the NPT and providing a credible guarantee for peaceful nuclear cooperation.

If it is difficult to cover all nuclear items, at least all so-called sensitive nuclear facilities, such as enrichment, reprocessing, and heavy water production facilities, should be placed under fall-back safeguards in perpetuity.

3.2 Realizing the MNA to strengthen peaceful uses of nuclear energy

For the practical implementation of the MNA-related action plan of the 2010 final document, the framework of the MNA can be discussed and adopted in a form of resolution at the NPT review conferences. Implementing the resolution would be monitored regularly as part of implementation review of the Article 4.

In terms of fuel supply assurance, some progress has been made, such as the establishment of the IAEA LEU Bank, but further discussions based on the existing IAEA proposal are needed to achieve a generic type of the MNA.

Unlike nuclear fuel supply, among the two benefits of the MNA, management (including disposal) of spent fuel is a serious concern of the international community, and it is a barrier to the introduction of nuclear power in developing countries. Therefore, if a solution to spent fuel management can be obtained through the MNA, developing countries' interests in introducing nuclear power will be enlarged and the peaceful uses of nuclear energy in the NPT regime will be facilitated.

The ROK-US Agreement for nuclear cooperation (NCA) concluded in 2015 specifies the obligations and the rights of both parties and third countries for overseas reprocessing (Article 10, para 3). It can be used as an option for spent fuel management. If an NCA between a developing country and a supplying country includes prerequisites for overseas reprocessing or overseas disposal, this could be useful when disposing spent fuels is more urgent than building a closed fuel cycle in the developing country.

4. Conclusion

This paper presents the different approaches between developed and developing countries to the three issues in the field of peaceful uses of nuclear energy, similar to the ones lasted for fifty years across the NPT. As a way to overcome the different approaches, the paper makes two suggestions to deal with common concerns between them. One is to address the threats to international peace

and security following the withdrawal from the NPT, and the other is to compromise the demands and concerns of spreading sensitive technologies. It is expected that these suggestions beneficial to both of them lead the discussion at the 2020 NPT Review Conferences in a constructive manner.

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