

A Study on the Concept of Denuclearization: Focusing on Verification

Jung-Hyun LEE*, Young Wook LEE

Korea Institute of Nuclear Non-proliferation and Control, 1418, Yu Sung Dae Ro, Yu Sung Gu, Daejeon, Korea

*Corresponding author: leejh@kinac.re.kr

1. Introduction

Since the existence of secret nuclear facilities in Yongbyon was revealed in the 1980s, the North Korean nuclear issue remains unresolved [1]. Once North Korea realized nuclear weapons were an effective means of maintaining its own regime, it has continually expanded its nuclear capabilities despite conciliatory efforts and pressure of the international community [2]. In 2017, the North Korean nuclear issue escalated when North Korea conducted its largest nuclear test to date which it claimed to successfully test a thermonuclear bomb designed for a long-range missile. In November, it made a declaration about the completion of a state nuclear force [3]. In response to North Korea's nuclear provocations, the Trump administration seriously considered a preemptive precise attack including precise strike on North Korea [4].

Through the five-year plan (September 2017) and Korean Peninsula Policy (November 2017), the South Korean government consistently lead efforts to promote denuclearization dialogue between North Korea and the United States. As a result, three inter-Korean summits and one US-North summit were held in 2018 to agree to improve overall inter-Korean relations, alleviate military tensions and resolve war threats, and establish a complete denuclearization of Korean peninsula [5].

No agreement was reached at the second US-North summit held in Hanoi, Vietnam in February 2019, which confirmed the differences between the two sides on the definition and scope of denuclearization. Since both parties have decided to continue the further practical consultation after the Hanoi Summit, subsequent negotiations are expected to resume soon [6].

Each word and phrase in the negotiation process and agreement will serve as a basis for future implementation of a denuclearization agreement and will be a measure of judgement in the event of a dispute on the interpretation of words or phrases of the agreement. It is necessary to clearly define core concepts related to denuclearization as well as to establish robust plans for denuclearization to be included in the agreement.

2. Methods and Results

2.1 Conceptual Clarification of Denuclearization

In order to clarify the term denuclearization, we have compared it with similar terms such as Nuclear disarmament and Nuclear Weapon Free Zone (NWFZ).

Disarmament is one of the means of Arms Control to eliminate or reduce armaments to bring an end to arms race. Nuclear disarmament can be defined as the act of eliminating or reducing or nuclear weapons [7].

Denuclearization, on the other hand, means the complete removal and prohibition of nuclear weapons and nuclear weapons development programs. Denuclearization is distinguished from disarmament by its goal of "completely" eliminating nuclear weapons.

Nuclear Weapon Free Zone (NWFZ), a concept borrowing from the Demilitarized Zone (DMZ) [8], is a specified region in which countries commit themselves not to manufacture, acquire, test, or possess nuclear weapons by adopting a treaty on the non-existence of nuclear weapons (NWFZ Treaty). The regions currently covered under NWFZ Treaty include Latin America (April 1968), the South Pacific (December 1986), Southeast Asia (March 1997), Africa (July 2009) and Central Asia (March 2009) and so on [9]. According to the UN General Assembly resolution 2472B of 1975, the Parties of the NWFZ Treaty should establish (i) a statute of total absence of nuclear weapons that comprehensively ban the production, possession, deployment and testing of nuclear weapons, (ii) an international system of verification and control to ensure compliance with obligations deriving from that status. For the success of NWFZ, the five Nuclear Weapon States (NWS), officially recognized as possessing nuclear weapons by the NPT, shall provide Negative Security Assurance (NSA) to the Parties of the NWFZ Treaty. Denuclearization is based on related political declaration or agreement that is not legally binding. The denuclearized country is not necessarily granted NSA by the five NWS [10].

Table I: Definition of Denuclearization; Comparison with Nuclear Disarmament and Nuclear Weapon Free Zone

	Denucleari- -zation	Nuclear Disarmament	Nuclear Weapon Free Zone
Goal	Elimination and Prohibition of Nuclear Weapons	Elimination or Reduction of Nuclear Weapons	Elimination and Prohibition of Nuclear Weapons
Basis	Not Legally Binding (Political declaration or Agreement)	Not Legally Binding And Legally Binding	Legally Binding (Treaty)
NSA Grant	Not necessary	Not necessary	Necessary

2.2 Concept of Denuclearization of Korean Peninsula

In order to ensure compliance with the obligations pursuant to the provisions of the Joint Declaration on the Denuclearization of the Korean Peninsula, established in 1992, a mutual inspections system was adopted as below [11];

- Denuclearization target area/country
 - Korean Peninsula (South and North Korea)
 - Scope of denuclearization
 - Nuclear testing, manufacture, production, receipt, retention, storage, installation, use prohibited
 - Prohibition of nuclear reprocessing facility and uranium enrichment facility
- ※ Peaceful nuclear use rights are guaranteed

Since then, US has withdrawn all its deployed tactical nuclear weapons, but North Korea has continued to develop nuclear weapons without complying with the Joint Declaration. In order to prevent this, bilateral talks between North Korea and the United States were held in the 1990s. As a result, the Agreed Framework was adopted on October 21, 1994 to achieve peace and security on the Korean Peninsula free from nuclear weapons. To do so, the agreement provides another term, 'nuclear-free Korean Peninsula', instead of 'denuclearization of the Korean peninsula'. However, as one of its implementation measures, North Korea should consistently implement the Joint Declaration [11, 12].

In the 2000s, nuclear negotiations were pursued through the 'Six-Party Talks', involving North Korea, South Korea, the United States, China, Russia and Japan. The main documents and agreements adopted as a result of these negotiations set "Denuclearization of the Korean Peninsula" as the objectives of the negotiation or important enforcement measures without any definition of terms.

The '9.19 Joint Statement' (2005), which was agreed during the 5th six-party talks meeting, stated that the goal of the six-party talks was 'the Verifiable Denuclearization of the Korean Peninsula'. It also reaffirmed that Korea will not accept or deploy nuclear weapons in accordance with the Joint Declaration [13].

Conservative proponents and experts point out that the goal of resolving the North Korean nuclear issue is not the denuclearization of North Korea but the dismantlement of the North Korean nuclear weapons. Therefore, the denuclearization of the Korean peninsula is the failure or retreat of the government's security strategy [14, 15].

However, it can be seen that the denuclearization of the Korean peninsula has been consistently adopted as a goal and a major remedy for the nuclear negotiations over the past three decades.

2.3 Concept related to Specific implementation measures of denuclearization

Without a commonly available standard, the specific implementation steps/measures of denuclearization could vary depending on negotiations. Under the 1994 Agreed Framework, North Korea would freeze and eventually dismantle graphite-moderated reactor, reprocessing plant and related facilities [16]. Under the agreements derived from Six-Party talk, denuclearization would happen in three-step process: (Step 1) Shut-down, (Step 2) Declaration and Disabling, (Step 3) Dismantlement [17]. Table II summarizes the implementation measures of the denuclearization set up in existing North Korean nuclear agreements.

Table II: Specific implementation measures of denuclearization

Term	Description
Shut down	▪Measures to Suspend Facilities
Freezing	▪Measures to shut down and prevent access to Facilities for a long time -The level of freezing is determined by whether minimum access for maintenance is allowed or not
Disablement (Disabling)	▪Measures to delay normal operation for a certain period of time by removing or destroying some components or equipment -irreversibility of disablement is determined by whether key component of equipment is removed or not
Declaration	▪Submit information on the location, number, characteristics and status of treaty-limited equipment and details of restricted activities (ex. list of facilities, design information, operational records, balance of materials) - information about location of associated facilities, materials and activity may also be required -Details on the scope and timing depend on the agreement
Dismantlement	▪Physically removing and demolishing all facilities/materials permanently -Decommissioning is more comprehensive term that includes deactivation, decontamination, dismantling, demolition, and disposition.

2.4 Concept of verification

Verification is a core terminology of arms control and denuclearization negotiations. In 1987, during the journey to the end of the Cold War, the United States and the Soviet Union signed the INF (Intermediate-Range Nuclear Forces) treaty model based on the INF negotiations and agreement, Research on the verification started. In 1990, to discuss the overall aspects of verification, the United Nations Panels of Experts on Verification was established, which led to a

total of three meeting (1990, 1995, 2006) [18, 19, 20]. Para. 9 of the 2007 United Nations General Assembly Report(A/61/1028), published to summarize the results of the last meeting, defined verification as follows.

Verification is a tool to strengthen international security. It involves the collection, collation and analysis of information in order to make a judgement as to whether a party is compliant with its obligations. Such obligations may derive from treaties, agreements or arrangements or from decisions of competent multilateral institutions such as the Security Council [20].

Verification measures designed in the 1994 Agreed Framework, and Agreement from the six-party talks are shown in Table III [12].

Table III: Verification measures designed in the 1994 Agreed Framework, and Agreement from the six-party talks

Agree-ment	Related Articles
Agreed Framework-work (1994)	I-3) ① ..During this one-month period, and throughout the freeze, the <u>International Atomic Energy Agency (IAEA) will be allowed to monitor this freeze, and the DPRK will provide full cooperation to the IAEA for this purpose.</u> IV-3) When a significant portion of the LWR project is completed, but before delivery of key nuclear components, the DPRK will come into full compliance with its safeguards agreement with the IAEA (INFCIRC/403), including taking all steps that may be deemed necessary by the IAEA, <u>following consultations with the Agency with regard to verifying the accuracy and completeness of the DPRK's initial report on all nuclear material in the DPRK.</u>
2.13 Agree-ment (2007)	II. The Parties agreed to take the following actions in parallel in the initial phase: 1. The DPRK will shut down and seal for the purpose of eventual abandonment the Yongbyon nuclear facility, including the reprocessing facility and <u>invite back IAEA personnel to conduct all necessary monitoring and verifications as agreed between IAEA and the DPRK.</u>

The participants in Six-Party talks have been discussing the importance of verification measures that will allow the Parties to reliably verify North Korea's denuclearization as the process moves forward. In July 2007, the Six-Party Heads of U.S. Delegation met in July to discuss verification measures, and draft papers were exchanged among the Parties. The discussion draft was unclassified but was released through the media. What was noteworthy of the draft on the limitation of verification of Non-Nuclear Weapon State (NNWS) are the following [21]:

- Six Party Experts will be determined by their national governments, and will coordinate their

actions in order to implement the agreed verification plan

- Verification activities involving weaponization-related activities, information, facilities or material, will be conducted by experts from the NWS as defined by the NPT. Specifically, expert form the Nuclear Weapons States will;
 - Conduct all verification activities relating to nuclear weaponization, including verification of all related information, personnel, facilities or materials; and
 - Conduct sampling and forensic analysis and interviews of personnel as necessary to accomplish these verification activities
- Information about weapons activities would be shared with the Sixth Party experts who are not from NWS to extent consistent with the NPT

On July 12, the Six-Parties released a Press Communique stating that verification measures would include visits to facilities, review of documents, and interviews with technical personnel as well as other measures unanimously agreed among the Six Parties.

Upon the invitation of the North Korean government, a U.S. negotiating team on behalf of the Six Parties visited Pyongyang from October 2007 for intensive talks on verification measures. Based upon these discussions, U.S. and North Korean negotiators agreed the Verification Protocol on a number of important verification measures, including [22]:

- Experts from all Six Parties may participate in verification activities, including experts from non-nuclear states;
- The IAEA will have an important consultative and support role in verification
- Experts will have access to all declared facilities and, based on mutual consent, to undeclared sites;
- The use of scientific procedures, including sampling and forensic activities; and
- All measures contained in the Verification Protocol will apply to the plutonium-based program and any uranium enrichment and proliferation activities.
- In addition, the Monitoring Mechanism already agreed by the Six Parties to monitor compliance with Six-Party documents applies to proliferation and uranium enrichment activities.

At the six-party talks, a narrow sense of 'verification' emerged to negotiate verification measures on North Korea's declaration. In the end, the on-site verification of North Korea's declaration report and absence of undeclared nuclear activities was not conducted, due to North Korea's opposition [2].

As a result, it made many people misunderstand that verification measures have not been conducted in North Korea.

3. Conclusions

This paper examined how the traditional arms control theory defines denuclearization and verification. It was reaffirmed that **the verification (in a broad sense) on the North Korea's compliance was conducted by the IAEA inspectors who stayed in Yongbyon.**

Through analysis of the concept of 'Denuclearization of Korean Peninsula, we conclude that it can be seen as a suitable purpose for the North Korean nuclear negotiations. As we have seen above, the denuclearization of the Korean peninsula is aimed at abolishing the North Korean nuclear weapons completely. **Pursuing this goal also helps to establish a role for South Korea to actively lead and participated in the denuclearization process.** However, "nuclear disarmament" negotiations aimed only at managing North Korea's nuclear weapons (including missiles) by limiting them should not be the only solution.

It also identified key terms related to specific implementation measures of denuclearization already applied to the existing North Korea nuclear agreement. It could raise the foundation to make a strategy of denuclearization support.

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