A Study on Strengthening Export Controls on Strategic Items under Bilateral Nuclear Cooperation Agreements

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1. Introduction

Exporters of nuclear-related items are governed by two pivotal domestic laws. Firstly, they must obtain export licenses for items on the nuclear trigger list (TL), as mandated by the Foreign Trade Act and its accompanying regulations on strategic items. Secondly, they are bound by obligations stemming from bilateral nuclear cooperation agreements(NCA) outlined in the Nuclear Safety Act and related regulations. Although the Nuclear Safety and Security Commission(NSSC) oversees most TL items, the regime also includes dual-use items, leading to procedural discrepancies in export controls. Previous research has highlighted the risk of regulatory gaps and the imperative for systemic refinement.

Notably, dual-use items like tritium, not classified as TL but equally critical and controlled, require export licenses under the Foreign Trade Act, administered by the Ministry of Trade, Industry, and Energy. However, this Act falls short of addressing NCA implementation, posing administrative challenges. Despite the legally binding nature of NCA, as affirmed by Article 6 of the Korean Constitution, the existing legal framework is insufficiently robust. The recent initiatives, like the development of a tritium extraction facility at the Chernaboda nuclear plant and the drive towards tritium's commercial use in fusion energy[2], underscore the importance of addressing these legislative shortcomings.

This study aims to examine the export control procedures for items subject to the Agreements, but non-TL, and to propose appropriate system improvements. However, given the broad scope of the NCA and related items, the scope of the study is limited to strategic items, which are primarily managed under the Foreign Trade Act..

2. Non-Trigger List Item of ISA

The Republic of Korea(ROK) has entered into bilateral NCA with 28 countries, of which 19 explicitly specify the items covered by the agreements in the text or annexes. The items subject to these agreements (ISA) largely align with the TL items under the Nuclear Suppliers Group (NSG) Guidelines or the Public Notice of Exportation and Importation of Strategic Items. However, each NCA may include items not listed in the NSG guidelines. For instance, Table 1 illustrates some of these distinct inclusions.

In particular, Canada and Romania, which operate heavy water reactors, include dual-use items, such as tritium and tritium removal facilities, in their agreements. In contrast, the NCA with the United States specifically covers only the tritium produced through the use of moderator material, such as deuterium, transferred pursuant to the agreement. Moreover, Indonesia's NCA encompasses particle accelerators and certain non-reactor-related devices intended for research, medical applications, or isotope production. These items might be classified as dual-use depending on the export control criteria, yet their exact categorization remains ambiguous due to the lack of clear specifications in the agreement.

Table I: ISA not included in the Trigger Lists

Item	Use	Country	Obligation
Tritium	-	CA, RO, US	Peaceful use Prior consent for retransfer Right of return
Tritium facilities, plants, and equipment	Production, recovery, extraction, concentration or handling of Tritium	CA, RO	Peaceful use Prior consent for retransfer
Particle Accelerators	Scientific research Industrial application Medical treatment	ID	
Other non reactor-related devices	Industrial Healthcare Agriculture environment	ID	

3. Export Control Procedures and Responsible Authorities for ISA

Before proposing procedural improvements, we reviewed the current status of the export control system for ISA, which is classified as strategic items as follows. ISAs are subject to reporting obligations under Article 98 of the Nuclear Safety Act, and strategic items(trigger

list items or dual-use items) are subject to licensing under Article 19 of the Foreign Trade Act. Therefore, procedures under both laws must be implemented.

3.1. Export Control of ISA under the Nuclear Safety Act

According to Article 98 of the Nuclear Safety Act and Articles 22 and 30 of the Regulations on the Reporting of Internationally Controlled Materials, exporters of ISA must report international transfers to the NSSC. Reporting includes quarterly reporting when exporting equipment and technology(Article 22) and reporting under bilateral Agreements(Article 30). The import of ISA is preceded by a notification (or Government to Government Assurance(GTGA)) from the exporting country, so the importer will fulfill the reporting under Articles 22 and 30 only when requested by the NSSC.

3.2. Export Control of ISA as the Strategic Items

In the case of exporting trigger list items subject to the NCA, the NSSC shall issue an export license after receiving a GTGA or written confirmation that the items transferred from the ROK will be subject to the terms and conditions of the bilateral Agreement, following Article 18 of the Public Notice of Exportation and Importation of Strategic Items. In this case, the export license authority and the authority implementing the bilateral Agreement are the same as NSSC.

In the case of exporting dual-use items, despite the need for written confirmation from the importing country that it will comply with the terms and conditions of the bilateral NCA, there is no basis for receiving a guarantee from the importing country's government under the Public Notice. Dual-use items require obtaining an export license from the Ministry of Trade, Industry, and Energy, not NSSC, which implements bilateral agreement obligations. Principally, these licenses may be issued without a guarantee from the importing country, as the NSG Guidelines and Public Notices do not stipulate any procedures or conditions for securing a GTGA.

In addition, the responsible authorities and the form of written exchange vary depending on whether an administrative agreement is signed, like in Table II. For example, suppose tritium and tritium-related equipment are exported to Canada, which has an administrative agreement between the NSSC and the CNSC. In that case, it requires an export license from the MOTIE and executing an administrative agreement (written information exchange) through the NSSC. On the other hand, export to Romania, which does not have a separate administrative agreement, requires an export license from the MOTIE, and the GTGA that guarantees the items should be subject to the bilateral NCA is required. The GTGA is facilitated through the MOFA and NSSC, the authority for implementing the NCA.

As mentioned above, since the export license authority for dual-use items is different from the agency that implements the NCA or guarantees the GTGA, a loophole in the application of the Agreement is bound to occur unless the authority implementing the NCAis aware of the export of tritium or tritium handling equipment in advance. Moreover, since the determination by the specialized institutions is not required for the non-TL items according to the public notice, there is no system to help the authorities of NCA recognize the export plan for those items.

Table II: Export Control for ISA

Itemization	Procedure	National Law	Responsible Authority	
			with AA	w/o AA
Trigger List item	Apply Export License	Notice[1)] Article 19	NSSC	NSSC
	(NM) Advance Reporting	Regulation[2)] Article 11	NSSC	NSSC
	International Transfer Information Exchange	Regulation Article 22 and 30	NSSC	NSSC
	GTGA	Notice Article 18	NSSC	NSSC
	Issue the License	Notice Article 19	NSSC	NSSC
Dual-use item	Apply Export License	Notice Article 19	MOTIE	MOTIE
	International Transfer Information Exchange	Regulation Article 22 and 30	NSSC	MOFA (NSSC)
	Issue the License	Notice Article 19	MOTIE	MOTIE

1) Public Notice of Exportation and Importation of Strategic Items
2) Regulation on the Reporting of Internationally Controlled Materials

4. System Improvement for Export Control

KINAC endeavors to prevent the omission of the NCA by further reviewing whether an item is subject to the NCA when the specialized determination stage or by informing exporters through pre-consultation for some newly starting projects. In addition, the following two improvement measures are proposed to minimize the loophole caused by the mismatch between the primary agent of the export license and the implementation of the NCA..

The first is fostering cooperation between the agent of export licensing(MOTIE) and the agent implementing the agreement(NSSC). This cooperation is crucial during the license review process, and necessitates establishing a clear basis for collaboration and

clarifying the criteria for determining whether the item is an ISA. For example, Article 9 of the Public Notice of Exportation and Importation of Strategic Items requires the head of the licensing organization to consult with relevant ministries for some items. Similarly, the phrase, "The head of the licensing organization shall consult with the NSSC in advance when licensing strategic items subject to the NCA", can be added. In addition, it may be necessary to add conditions to review further whether an item is subject to the specific NCA and whether the agreement has been implemented at the specialized determination or export license stage.

The second enhancement proposes the inclusion of certain ISA within the trigger list. Whereas the previous proposal would require the current 'export licensing agency' to recognize that an item is an ISA and request implementation or cooperation, this proposal would require the current 'NCA implementing agency' to become the 'export licensing agency.' Zirconium, graphite, etc., are dual-use items and may also be TL items if they meet specific criteria or are utilized in nuclear applications. Similarly, tritium and related facilities could be added to the trigger list based on whether or not they are used for nuclear purposes, thereby matching the implementing and licensing authorities. However, as national legislation is currently based on NSG guidance, it would require further consideration within the multilateral system and, if necessary, could be applied after the NSG agreement, which was adopted by a unanimous system.

Diversifying the Agreement Implementing Entities along with the Export Licensing Entity was contemplated. However, the option is inappropriate for the following reasons: The primary purpose of the information exchange, according to the NCA, is to ensure control by the supplier and nuclear nonproliferation measures by the receiver. Also, it's underlying the NSG Guideline Part 1. There is a need to manage imports outside of export licenses, and the NSSC is the subject of the authority of the administrative agreement setting out the procedures for implementing the NCA.

5. Conclusion and Recommendations

This study has reviewed the export licensing and implementation of NCA procedures only for the strategic items that do not belong to the trigger list among the ISA. In order to minimize the possibility of loopholes arising from the diversity of the items subject to 28 countries' agreements and the difference between the implementing entities of NCA and export licensing entities for strategic items, it is proposed to strengthen cooperation between export licensing entities and the implementing NCA entity, to add or modify the trigger list items. Although there have not been many actual cases of nuclear-related dual-use items being exported, the system should be improved in the appropriate direction in the future, as efforts to export nuclear energy are becoming more active in line with national policy. In the future, further research may be needed on how to implement the agreement in the case of exporting non-strategic items but subject to NCA, like in the Indonesia case.

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