The operational strategies of KAERI's IAEA Additional Protocol system for optimizing nuclear nonproliferation

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1. Introduction

In 1997, the Model Additional Protocol was approved by the IAEA Board of Governors, and our government received approval from the IAEA Board of Governors in March 1999 and signed it in May. The Additional Protocol was ratified by the National Assembly on February 9, 2004, and came into effect on February 19, 2004, upon its deposition with the IAEA. Following the Additional Protocol, the government has been submitting an annual declaration to the IAEA since its initial submission in August 2004.

Since 2004, KAERI has been drafting and submitting an annual declaration to the IAEA that includes research and development projects related to the nuclear fuel cycle that do not involve nuclear materials, as well as information about the site of the research institute. The Nuclear Safeguards and Export Control Team has developed and is operating a computerized system for the efficient preparation and management of the expanded declarations relevant to the research and development projects.

This paper describes the IAEA expanded declaration for the KAERI facilities and the content related to the KAERI AP system.

2. The AP Declaration at KAERI

Since the Additional Protocol (AP) came into effect in South Korea, KAERI has been submitting an annual report to the IAEA, and the IAEA has conducted Complementary Access (CA) at the KAERI site to verify the absence of undeclared nuclear material and activities. KAERI must submit the annual report to the Republic of Korea's State System of Accounting for and Control of Nuclear Material (SSAC) by the end of March each year. The AP annual report includes the following information:

Article 2.a.(i): Government-funded research and development (R&D) activities related to the nuclear fuel cycle that do not involve nuclear material.

Article 2.a.(iii): A description of each building on the site including a site map.

Article 2.a.(iv): Manufacturing activities specified in Annex I to the AP.

Article 2.a.(x): A ten-year plan for the development of the country's nuclear fuel cycle.

3. The AP system of KAERI

KAERI hosts many nuclear cycle projects, and there are numerous small buildings that must be reported in the AP annual report, making the compilation of this report quite intricate. Following the AP's announcement, for nearly a decade, IAEA's "Protocol Reporter" program was utilized for reporting. However, due to its limitations, KAERI developed its own AP system.

The AP system at KAERI is designed not only to efficiently prepare the annual report but also to meet the requirements set by the IAEA. This system manages all AP information, including R&D project information conducted within KAERI, building information on the KAERI site, and the status of the annual report. KAERI is upgrading the system for efficiency and user convenience.



Figure 1. Schematic Diagram of the AP System Operation

3.1. 2.a.(i) Research Project

KAERI's integrated Management Information System (MIS) and the AP system facilitate a seamless process for project managers to input data regarding their projects. This integration allows for the efficient management of the roster of KAERI R&D projects, which are sourced from the MIS. The system ensures all R&D project managers are alerted to submit their project details when these align with the criteria set out in articles 2.a.(i), (iv), or (x) of the AP. Typically, the system categorizes over 900 projects annually as either eligible for reporting or exempt. Any alterations in project titles or shifts in research focus that necessitate reporting are updated in the system by the project managers' judgment. This process is intrinsically linked to the documentation required by article 2.a.(iii), contingent on the specific buildings where the project activities are conducted.

3.2. 2.a.(iii) Building Information

Information about buildings on the site is obtained from relevant departments and by surveying the site. Once the collected information is entered into the AP system, it automatically links to the previously entered 2.a.(i) projects. This allows identification of which projects are conducted in which buildings. We are continuously operating this system, correcting system errors, and concurrently enhancing its features.

3.3. Advantages and Disadvantages

The biggest advantage of the AP system is its ability to reduce human errors and omissions by automating processes. In fact, we have filtered out many human errors through the AP system. An additional benefit is the reduction in manpower required for the same tasks.

The only drawback of the AP system is that project managers must decide for themselves whether their project falls under an AP declaration. Therefore, we are consistently educating about the AP declaration and maintaining continuous alerts within the system.

In the future, the system should be improved to automatically verify projects and determine their applicability to the AP declaration, even if PMs are not fully aware of the AP declaration.

4. Conclusion

The AP system devised by KAERI has been strategically developed to streamline the preparation of annual reports while ensuring compliance with IAEA standards. Ongoing enhancements to the system promise to further decrease the time needed for report compilation and boost the system's dependability. Insights from the development of this system are anticipated to significantly contribute to optimizing the AP's execution within KAERI. KAERI is committed to diligently pursuing the effective deployment of the AP, aiming to fulfill the criteria specified by the IAEA under the AP framework in its future endeavors.

REFERENCES

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[3] Model protocol additional to the agreement(s) between state(s) and the international atomic energy agency for the application of safeguards, Annex I

[4] Model protocol additional to the agreement(s) between state(s) and the international atomic energy agency for the application of safeguards