

Integrated Safeguards at KAERI-Daejeon Site

Hyun-Jo Kim, Byung-Doo Lee

Korea Atomic Energy Institute, 150-1 Deokjin-dong, Yuseong-gu Daejeon, 305-353, keiki@kaeri.re.k

1. Introduction

The IAEA has verified the declared nuclear material according to the comprehensive safeguards agreement under NPT between the Republic of Korea and the IAEA, as well as the undeclared nuclear material and nuclear activities under the Additional Protocol. The Agency drew the broader conclusion for Korea in the safeguards Implementation Report(SIR) for 2007 that all nuclear material remained in peaceful activities in Korea since there was no indication of the diversion of declared nuclear material, and no indication of undeclared nuclear material and activities in the ROK. It means that the Agency's inquires on all past undeclared activities involving uranium enrichment, conversion and uranium/plutonium separation experiments declared by the KAERI's initial declaration pursuant to the Additional Protocol in 2004 were resolved. Based on the Agency's safeguards conclusion, it is expected that KAERI will revitalize the nuclear R&D activities with an improvement of the nuclear transparency by the broader conclusion.

The IAEA informed the MEST on June 9, 2008 that the implementation of Integrated Safeguards(IS) in Korea is started on 1 July, 2008 in accordance with the state level IS approach after a draw of the broader conclusion. The relevant procedures for the implementation of integrated safeguards on all nuclear facilities located at KAERI-Daejeon site have been reviewed and discussed with IAEA since Aug., 2006.

This paper describes the major contents on procedures for the implementation and the preparedness status of IS including new nuclear material accountancy system at KAERI site.

2. Integrated Safeguards Measures at KAERI-Daejeon site

2.1 IS approach at KAERI-Daejeon site

IAEA proposed the IS concepts on 10 nuclear facilities at KAERI as KAERI-Daejeon site level IS approach, which is based on the site consideration, at the 4th IS working group meeting held in Vienna and provided a draft procedure for the implementation of IS in August 2006.

IAEA grouped the nuclear facilities and LOF(Location Outside Facility) at KAERI-Daejeon site as two categories, according to the design features, purposes, nuclear material inventories, material type. Category I facilities consists of HANARO and PIEF while the remaining facilities such as IMEF, Nuclear Material Storage Facility, DUF4 conversion plant,

KAERI R&D Facility, Advanced Spent Fuel Conditioning Process Facility, HANARO Fuel Fabrication Plant, DUPIC facility and KAERI-LOF are grouped as category II facilities.

IAEA proposed new safeguards measures for each category facility to perform sufficient verification activities to contribute to the conclusion of non-diversion of declared nuclear material and, in combination with complementary access(CA) and other measures, to confirm the absence of undeclared nuclear materials and activities.

The major safeguards measures proposed by IAEA under IS are Random Interim Inspection(RII), advanced facility information for RII, advanced notification for RIIs and PIV(Physical Inventory Verification)/DIV(Design Information Verification)s, RIIs/PIVs activities at KAERI-Daejeon site. The IAEA will perform RIIs and PIVs at the facilities and LOF on site selected randomly from respective Categories, according to the facility advanced information and other information declared by KAERI to the Agency. KAERI has started to review the IS procedures with the relevant facilities to find the un-practical implementation article at the facilities since Aug. 2006. Also, KAERI has discussed the detail IS procedures with IAEA to resolve the un-practical implementation article.

2.2 Comparison of TS and IS

The comparison of safeguards works in Traditional Safeguard(TS) and Integrated Safeguard(IS) is shown in Table 1.

Table 1. Comparison of safeguard work under TS and IS

	TS	IS
IAEA Inspection	16	8
National Inspection	About 16 (2007)	About 20 (2008)
PIT	1/year (2007)	4/year (2008)
Advanced information	-	Monthly, Quarterly, Annual

The IAEA's routine inspection efforts at KAERI site will be reduced by 50% as compared with TS even though all the facilities have to do additional works to implement new safeguard measures under IS.

In addition, 1 RII and 1 PIV for each facility will be performed as national inspection only.

The national only inspection may be substituted by joint IAEA/national inspection depending on the randomness.

2.3 Preparation status of IS at KAERI

For RII, the facility has to prepare some documents such as inventory list in a short time. However, KAERI managed the nuclear material inventory change by paper and input the data into the system later. So, KAERI improved the nuclear material accounting system to treat the data by on-line, and it has been operated since August 1, 2008. Therefore, it is possible to manage the near real time data on inventory and inventory change.

Also, KAERI submitted initial monthly advanced information on HANARO in July 2008. So, KAERI needs to update the system for management of advanced facility information.

3. Conclusions

Implementation of IS was started on 1 July, 2008. Also, the nuclear transparency of nuclear activity is improved by a draw of the broader conclusion and implementation of IS.

The IAEA's routine inspection efforts will be reduced, but on the other hand additional works such as advanced facility information will be increased to implement new safeguards measures under IS. Also, national only inspection and quarterly PIT will be perform according to domestic regulations.

Therefore, a national policy is needed to reduce the inefficient safeguards works at the facility.

REFERENCES

- [1] IAEA, "Site Level Integrated Safeguards Approach for KAERI-Daejeon in ROK", 2007.
- [2] IAEA, "The Safeguards Implementation Report for 2007", 2008.