

## **Principles for National Inspections under IS Environment**

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### **1. Introduction**

In 1997 the ROK introduced 'National Inspection' for nuclear material accountancy in its territory, and continues its independent verification activities besides the IAEA inspections. In 2004 the Additional Protocol was effectuated, and the IAEA finally decided to apply Integrated Safeguard to the ROK in 2008. This was a very significant milestone for Korea's nuclear transparency, which means that there are only nuclear activities with peaceful purposes and no more undeclared or suspicious nuclear activities. With this turning point, the previous inspection activities – IAEA and national inspections all together – are to be adjusted to the new environment, i.e. Integrated Safeguards. Even for the SSAC, the objectives of national inspections are needed to be defined newly and its philosophy as well.

In this paper, the principles of national inspections are suggested to address any verification challenges from the IS environment.

### **2. IAEA Inspections under the IS**

Integrated Safeguards is a very important stage of developing the IAEA safeguards with strengthening effectiveness and improving efficiency. This new safeguards concept was originally introduced to overcome the lack of inspection resources and lessen the inspection burden onto the facilities. Under the IS, the optimized ways for safeguards implementation are continuously sought considering all the possible verification measures without losing any safeguards objectives. IS can be applied to a country on the condition that the CSA and AP are signed and implemented and the IAEA concludes there is no undeclared nuclear activity in its territory.

The inspection activities under the IS are focused on the sensitive facilities like reprocessing plants or enrichment. For the facilities like the PWR which is regarded to have little possibility for diversion, the inspection burden might be mitigated. The IS approach should be developed through negotiation between the IAEA and the state, considering the domestic nuclear fuel cycle and technical capability of the SSAC. The approaches are developed for each facility based on its characteristics and the basic criteria should be prepared as follows;

- Determination of timeliness goal and effective quantity for timely detection of diversion
- Selection of surveillance/containment/seal for each facility
- Performing of RII according to the random selection probability and expanding SNRI

In the ROK, IS procedures for each type of facility were developed and now are being implemented: PWR, CANDU, Research Laboratory, Fuel Fabrication Plant, and Research Reactors and Critical Assemblies. A site level approach is prepared for the research laboratory (KAERI). For the fuel fabrication plant (KNF), an additional approach for SNRI is prepared with a general IS approach.

With the start of IS implementation, the facility operators as well as the SSAC are required to adjust to the remarkably changed inspection environment and be more prepared.

### **3. Status of National Inspections**

In 1997, the ROK government decided to start independent national inspections for the purpose of improving its nuclear transparency. However, its verification capability at that time was not ready for drawing independent conclusion for non-diversion of nuclear material, so there was no option other than just following the IAEA's criteria and procedure, and the national inspections had been performed with the IAEA inspections at the same time. Fundamentally, there was no difference between the national inspections and IAEA's.

Since the implementation of the IS started in 2008, the ROK has performed its own inspection works separately from the IAEA's. These national inspections are carried out for all facilities once a year, but still using the same safeguards procedure and method with the IAEA. It is often pointed out that this kind of activity could be regarded as duplication of inspection. So the national inspections should be re-formalized as soon as possible in order to give some justifiable reasons differentiated from the IAEA inspections.

### **4. Principles Suggested for National Inspection**

The ROK now recognizes the necessity of establishing its own criteria and procedures for national

inspections. First of all, it needs to prepare a sound philosophy for national inspection, not like the one of the IAEA verification which assumes any possible diversion. It is nonsense if the national authority admits the possibility of diversion in its territory. It is just like that the criminal principal investigates itself. Therefore, some principles are suggested for establishing national inspection criteria, which assume there is no diversion of nuclear material in any case.

- 1) National inspections should be performed on the view of management of nuclear material by national authority.
- 2) The domestic regulations for the control of nuclear material should be the sufficient condition for IAEA verification.
- 3) The objectives and criteria of national inspection should be developed, which supports national nuclear transparency.
- 4) A well-organized reporting system for nuclear material accountancy should be established and operated effectively.
- 5) The national authority and facility operator should cooperate on effective and efficient inspection activities.

## **5. Conclusions**

It is the undisputed truth that independent and effective national inspections can enhance nuclear transparency. Also it is necessary to set up the system for national inspection since the SSAC's roles are to be enlarged in the IS system. Furthermore, it is prerequisite to establish the identity of national inspection differentiated from the IAEA's and avoid any unnecessary duplicated inspection activities. In this paper, IAEA's inspections under the IS and the current status of national inspections are introduced and the basic principles for national inspections are suggested, which can be references for preparing objectives and criteria of future national inspections.

## **REFERENCES**

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