

Methodology Study on the Enhanced Cooperation under Integrated Safeguards in the ROK

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1. Introduction

In accordance with the Safeguards implementation approach, in the early 2000 the IAEA has introduced the scheme of enhanced cooperation between the ROK and the IAEA aimed to share efforts based on cost benefits between the SSAC and the IAEA at LWRs.

In the last Joint Review Meetings and many working group meetings such as Enhanced Cooperation Task Force Group Meetings and Safeguards Implementation Working Group Meetings, both parties have emphasized the enhancement of the SSAC resource for a larger contribution to the Safeguards activities in almost all nuclear activities in the ROK. In parallel to this concept, both parties should keep into consideration the quality and the assurance of its independent Safeguards conclusions, respectively.

This study suggests the feasible methodology on the Enhanced Cooperation between the ROK and the IAEA to maintain the effectiveness (achieving the Safeguards goals) and improve the efficiency.

2. Necessary Preparation to Implement EC

The continuous cooperation between the ROK and the IAEA has shown in the previous decade a notable success in Safeguards activities, especially at LWRs where remote monitoring measures are implemented. Moreover, such scheme of cooperation has successfully initiated and maintained the development of what is called Joint Use principles with regards to the equipment and their respective procedures.

Referring to the above, necessary preparation to implement Enhanced Cooperation (EC) should, first of all, take into consideration the assurance of both parties' independent conclusions. The major elements of this preparation are as follows:

- Establishment of the Guidelines for Joint Inspection at Fuel Fabrication Plant and CANDU Dry Storage
- Assurance of the SSAC's technical competence level. For this element, training of the SSAC inspectors may be required;
- Finalization of General Part on Joint-use procedures and elaboration of special procedures and arrangements (facility specific);
- Authentication and installations of additional containment and surveillance (C/S) and NDA equipment;

- Arrangements on enhanced cooperation/use of all attended NDA
- Quality Assurance mechanism on all EC activities according to a "policy decision"
- Creation of joint documentation/report formats on all EC activities (e.g. NDA, Destructive Assay (DA), C/S, book audit, etc.).

3. EC under Integrated Safeguards

3.1 Review of the Arrangement under Integrated Safeguards

In order to strengthen the safeguards systems, new or revised policies from the IAEA, and from the ROK, have been developed and implemented. Even though the new measures fulfill the Legal framework of the Arrangement, a measure may trigger a large impact on the Facility Parties.

The ROK and the IAEA have conducted discussions on these new measures on an efficient and relatively fast mode. In some cases, discussions with the Facility Party are necessary. As an example, we can mention the procedure and the frequency of Random Interim Inspections (RII) and Short Notice Random Inspections (SNRI) at facilities. These activities should be conducted according to the State-Level Safeguards Approach under the Integrated Safeguards in the ROK and the raised issues throughout review and implementation of this Safeguards approach will be discussed and agreed upon during ROK-IAEA Joint Review Meeting (JRM).

3.2 Establishment of the Guidelines for Joint Inspection

Under Enhanced Cooperation (EC) scheme, both Parties support the "Joint Inspection" approach to scheduling and implementing Safeguards verification and technical activities in the State in order to avoid the duplication of verification activities. This means that the whole verification activities should be shared by both Parties and performed by inspectors assigned a part of verification activities based on the "One-Job-One-Person" concept. The results from both Parties should be shared to draw independent conclusion. Note that the number of inspectors from each Party will be dependent on the job complexity. The concept of joint inspection will firstly be applied for SNRIs and Physical Inventory Verifications (PIV) at Fuel Fabrication Plant and fingerprint measurement of dry storage at CANDUs and will be applied to other facilities. Both Parties shall establish the Guidelines and

the Procedures for Joint Inspection based on the concept of "Joint Inspection" mentioned above.

The ROK and the IAEA have been negotiating and preparing the framework for such implementation. Among that, the necessary steps and actions are the following:

- The **development and agreement** of well defined **Procedures for Inspection** activities such as **Guidelines for Joint Inspection**.
- **A full implementation of an Arrangement for Joint Use of Equipment**
- **Common Accountancy Inspection Procedures**

Again, all actions are taken with the aim of introducing savings where possible without losing the ability for each party to reach its own conclusion on the results of the inspections.

3.3 Cost Sharing and Joint Use of Equipment for Safeguards Purposes

Each Party will undertake the necessary financial obligations/responsibilities to provide funding and/or in-kind services to procure/install/operate/maintain/dismantle/dispose of joint-use equipment and communication expenses for remote monitoring data on a cost-sharing basis, guided by the principle of 50-50, wherein the financial details and arrangements are discussed and agreed-to during annual ROK-IAEA Joint Review Meeting (JRM). Only Joint-Use equipments and/or IAEA-approved equipments may be used during the inspections, and both Parties should establish the guidelines and general procedure for Joint-Use equipments when the EC is launched.

3.4 Data Sharing

The purpose of sharing data from safeguards equipment designated for joint use, while maintaining the integrity of the data produced through the use of such equipment, is that both parties are able to cooperate to have independent measurements and observations. Therefore, based on the shared data, independent safeguards conclusions are drawn in both parties, respectively.

3.5 Efficient Training of Inspectorate Personnel

Under the Enhanced Cooperation Arrangement between the ROK and the IAEA, the ROK and the IAEA share the inspection activities and/or use joint-use equipments in such a way that both sides would be able to gain efficiencies. In order to enhance the inspectors' capabilities, both parties provide contents and/or location of joint training programmes (e.g. Introductory Course on Agency Safeguards, providing ACPF for Pyroprocessing Techniques, etc.) for inspectors of both parties.

3.6 Reporting to the IAEA of SSAC Inspection Results and Operating and Accounting Records

The ROK SSAC inspections will be documented in a manner consistent with, and equivalent to, existing IAEA inspection documentation including use of the IAEA's Inspection Logsheet with the working papers completed.

The IAEA will supply the ROK SSAC with relevant information enabling the ROK SSAC to meet the documentation requirements.

The IAEA will prepare on a quarterly basis a 90(a) statement reflecting its independent conclusions with the results of the C/S review based on operating and accounting data sent by the ROK to the IAEA.

4. Conclusions

Based on the ROK SSAC' experience on Enhanced Cooperation with the IAEA at LWRs for many years, it is feasible to implement EC started at Fuel Fabrication Plant and at CANDUs. However, as mentioned above, major elements for the preparation to implement EC should be initiated by the IAEA's cooperation and support. In addition, Joint Inspection scheme should be established and analyzed throughout the case study on the Enhanced Cooperation to maintain the high credibility of both Parties' independent conclusions.

REFERENCES

- [1] W. S. Park, B. K. Kim, S. S. Yim, Y. M. Choi, Enhanced Cooperation between IAEA and Republic of Korea on Safeguards Implementation at Light Water Reactors, IAEA-SM-367/11/06.
- [2] W. S. Park, et. Al., Progress of LWR Enhanced Cooperation between Korea and IAEA, Korean Nuclear Society Spring Meeting 2001, Cheju, Korea.
- [3] O. J. M. Peixoto, H. E. Vicens, N. Whiting, Coordination Improvement on Safeguards Application between ABACC and IAEA, IAEA-CN-148/193.