Transactions of the Korean Nuclear Society Spring Meeting
Jeju, Korea, May 29-30, 2014

The Role of the ROK SP in IAEA's Long Term Strategic Plan

Na Young LEE, Jin Ho CHUNG
Korea Institute of Nuclear Non-proliferation and Control, Yusungdae-ro 1534, Yusung-Gu, Daejeon, Korea, 305-348
**Corresponding author: leeny@kinac.re.kr*

1. Introduction

Member State Support Program (MSSP) is a voluntary support program for the IAEA to assist in improving its verification methods and technologies, to make them more effective and efficient. MSSP is comprised of various programs such as development of safeguards approach, training, information analysis and so on. IAEA introduce their needs by means of new programs biennially through the coordinators' meeting. IAEA publish 'Development and Implementation Support Programme for Nuclear Verification' so that the member state can review it.

ROK signed Member State Support Program (MSSP) in 1997. Since then, it has been performed 27 support programs.

In this paper, IAEA's strategic plans will be reviewed in that how these plans are reflected in the support programs specified in the 'Development and Implementation Support Programme for Nuclear Verification[1]' book. Based on the results, we will analyze the past and on-going ROK Support Program (ROK SP) to suggest the direction to go.

2. IAEA's strategic plan

IAEA launched the long-range strategic planning project in 2008. As results, IAEA published series of documents which representing the top-down planning process. They are as follows:

1) The Long-Term Strategic Plan, 2012-2023, covering a 12-year period and identifying Departmental strategic objectives, approved for implementation in 2010 [2];
2) IAEA Medium Term Strategy (MTS) for 2012-2017;
3) The Long-Term R&D Plan, 2012–2023, which supports the implementation of relevant strategies of the long-term strategic plan, providing long-term directions for R&D that should be pursued over 12 years completed in January 2013. And finally,
4) The Development & Implementation Support Programme, 2014-2015. It introduces shorter term needs which are part of longer-term R&D planning.

Based on this systematic strategy, IAEA defines objectives and missions of each division and introduces activities needs support from the member states.

In the middle of the long term strategic plan, there is a 'State Level Concept', which means state should be responsible for the whole activities in its territory. Once the state ratifies Additional Protocol, then IAEA can access not only nuclear facilities but any other place. It means that the IAEA can draw the broader conclusion to say that the state has no hidden activities or nuclear material in its territory. Once the state has no hidden activities, then the IAEA can apply loose criteria since it will take longer to develop the nuclear weapon after they divert the nuclear material.

When the IAEA drew the broader conclusion, integrated safeguards can be applied to the state. Under the integrated safeguards, IAEA reduces the number of inspections according to the facility type.

In that case, IAEA needs more cooperation from the state to compensate the IAEA's efforts. Also, IAEA needs better equipment not to lose the effectiveness.

In the long term strategic plan, IAEA intends to focus more on the analysis of the information. IAEA can obtain information not only from the inspection activities, but also from other various open sources. IAEA requires various capabilities and analysis methodologies.

When the IAEA plans all these strategy, they changed their attitude from criteria driven to objective driven. Under the criteria driven, any type of facility regardless of their location, have the same safeguards procedure. Under the objective driven, transparent state can have fewer inspections based on the results of its evaluation.

To achieve its goal, IAEA tries hard to obtain appropriate capabilities based on the support of each state. That is, Member State Support Program should meet the IAEA's need to achieve its verification goal.

3. Evolution of the ROK SP

ROK SP has been changed ever since it first joined Member State Support Program (MSSP). It can be divided into three phases. The first phase is from 1998 to 2004. During the period, ROK supported programs to improve safeguards infrastructure related to the domestic facilities. Most of them were initiated through the request of the Agency. In 2001, ROK signed the Memorandum of Understanding (MOU) with the Agency for an Enhanced Cooperation on Safeguards Implementation at Light Water Reactors in the ROK. [3] Since then, programs on installation of the remote monitoring system in the LWR and transmission of the data to the Agency were supported.

In 2005, ROK SP entered the second phase after the first annual review meeting between ROK and IAEA. Through the meeting, ROK could better understand the Agency's request and had chance to explain our needs. Also, progress and difficulties were addressed through the meeting. From 2005 to 2009, ROK engaged actively to the support programs to improve the efficiency of the safeguards implementation in the facilities. For example, it started thinking of more efficient verification process and equipments. ROK developed new verification system tailored to the Korean facility. Through the MSSP, ROK went through the IAEA authentication procedure to be certified for the routine IAEA inspections, and it was registered as Category A device. ROK also supported development of a safeguards approach for a reference pyroprocessing plant. Since there is no commercial pyroprocessing facility, the IAEA does not have the safeguards approach yet. Through the ROK SP, IAEA can level up their understanding of the pyroprocessing facility, and we can get the model safeguards approach which is helpful for us to design the facility.

Year 2010 was a turning point to the ROK SP. It secured budget for the ROK SP. Before then, most of the support programs were financed through related project or from organizations. By securing its own budget in 2010, ROK could extend the scope of its support programs. It started discussion on training for the IAEA inspectors. For the IAEA to maintain and improve the verification capability of the inspectors, it requires trainings in the facilities. In Korea, we have both PWR type reactors and CANDU type reactors. Moreover, we have fuel fabrication facility which manufactures fuel assemblies for both PWR and CANDU type reactors. ROK SP supports advanced training course for the PWR and CANDU as well as training for the fuel fabrication facility. Also, ROK signed joint support programs which provide expertise in various novel technologies on verification equipments, safeguards on the geological repositories and so on.

4. Close cooperation through ROK SP

ROK SP has been evolved mainly through the environmental change of the ROK itself. From now on, we need to evolve in line with the IAEA's long term strategic plan to best support the IAEA to achieve its goal.

Based on the review of the IAEA's strategic plan, we need to focus on the following fields.

First, strengthening of the inspectors' capability is one of the most important factors. Based on this, IAEA is developing various lecture systems, software development, development of the textbook, as well as survey including the potential participants. KINAC recently open the International Nuclear non-proliferation and Security Academy (INSA). We can support the IAEA by co-developing the training course, collaboration on developing international safeguards textbook and software development.

Second, IAEA needs to develop better equipments to efficiently implement the safeguards. Member states should explore the ways to apply novel technologies to the verification of nuclear materials. We suggested to the Agency to co-work on development of verification equipment, which would be useful for both sides.

Third, information collection, analysis should be emphasized. IAEA put continuous efforts to strengthen the capability on information management. Under the state level concept, IAEA evaluate the state based on the information. Inspection results are also one type of information. Therefore, information management would be the key to the success of the future safeguards.

In implementing the support program, most of the countries have felt shortage of resources. Therefore, there are many support programs supported more than one states. These days, discussion on collaboration becomes extended. US support program, POTAS, requested member states to collaborate in developing the training software especially on the verification equipment. This will be one of the good examples that the member state initiates the new collaboration. These will help using the limited resources efficiently and effectively.

5. Future Plan

So far, we reviewed IAEA's long term strategic plan

and the way ROK SP need to pursue.

But there are other factors to consider for the better implementation of the support programs.

First, we need a certain technological level to support the Agency. That is, when we choose the field we want to join, we should be qualified for it. When we reviewed the booklet on the R & D published by the IAEA, we realized there were many items we didn't have capability to involve. Since we first involved in MSSP, we focused more on the safeguards implementation in the field; to improve the efficiency to reduce the PDI (person day inspection). Now, safeguards approach is moving towards the information-driven way. Therefore, we put more fund to establish basis for database and information analysis, which will be essential to prepare for the future safeguards system. Second, we need to systematize the ROK SP implementation procedure. Before we started annual review meeting, we didn't have enough chances to understand the IAEA's view and harmonize our capability and needs. There is coordinator for each member state, and technical contact person on each SP. All the information on MSSP is collected and reviewed periodically, and contact points of each side communicate each other more often to share the information. It improves the process in the higher level; however, still there is a need to inform the experts in many fields to understand safeguards and MSSP. Other than nuclear research fields, experts are lacking the understanding 'safeguards' and related technology. We hosted expert meeting domestically to inform what the Agency and ROK SP wants and what kind of technologies we have or develop. Third, we are trying to expand the research and development on the safeguards through international cooperation. Safeguards equipment has limited application target and there are small number of experts who understand the safeguards and its requirements which makes it difficult to commercialize. In the POTAS case mentioned above, we will put more efforts to collaborate together with international colleagues. Last, we will focus more on the items to support the IAEA. We can easily find items we need, however, some items are solely for the IAEA needs, which we need to discuss with the Agency, however to achieve the main goal of the MSSP, which is to support the Agency's need to effectively and efficiently implement safeguards mission, we will gradually extend our scope to support these items.

Through these efforts, we expect we can support not only the IAEA but also we can strengthen state's capability to implement safeguards.

REFERENCES

[1] IAEA, "Development and Implementation Support Programnme for Nuclear Verification 2014-2015", December 2013.

[2]http://www.iaea.org/safeguards/documents/LongTerm_Strategic_Plan_(20122023)-Summary.pdf

[3] Memorandum of Understanding(MOU) between the IAEA and the MOST of Korea for an Enhanced Cooperation on Safeguards Implementation at Light Water Reactors in the ROK, 2001