

A study on the implementation of ROK SP and development of new SP-1 through the D&IS

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1. Introduction

Member State Support Programs(MSSP) strengthen IAEA safeguards by providing specific services and development work. Main goal is to transfer technology and expertise, including development, provision and demonstration of technology, technical support, training, analysis services and human resources to the IAEA, thus contributing to the enhancement of international safeguards by improving their effectiveness and efficiency of safeguards implementation.

Since joining MSSP in 1997, ROK commenced its support activities with a task of “Provision of Open Source Information” in 1998 and has completed 22 tasks so far. Of course, as our endeavors continue, 15 tasks are under way. ROK is looking for new tasks related to MSSP by reviewing Development and Implementation Support (D&IS) Program for Nuclear Verification published by IAEA. As such, D&IS includes a research and development program of the IAEA safeguards department, which will also provide insights into the future direction of the IAEA. This document is published every two years and a new version of D&IS was created in February 2018. Based on this, ROK plans to increase the efficiency of the current MSSP program and explore new areas of business.

2. Current Status of Implementation ROK Support Program and New D&IS Program

2.1 Current Status of Implementation ROK Support Program

ROK has been steadily expanding its support and budget for 20 years since joining MSSP in 1997. So far, total 22 tasks have been completed and 15 tasks are under way. Plus, currently, the total number of MSSP states is 21 and ROK’s level of support for IAEA is about 6th. At the 2018 MSSP coordinator meeting, ROK was awarded a plaque of appreciation from the IAEA for the 20th anniversary of its membership in the MSSP. MSSP has demonstrated its significance in boosting the effectiveness of the IAEA safeguards by developing safeguards approaches, which has become one of the core elements of nuclear nonproliferation today.

TABLE I. ROK SP Budget
(Unit : K\$)

	'10	'11	'12	'13	'14	'15	'16	'17
Total	250	482	482	528	653	674	805	1050

ROK MSSP embarked on a program of training IAEA inspectors utilizing CANDU and LWR facilities in South Korea in 2010, which has served as a central instrument for evolving ROK MSSP. By doing so, ROK has not only contributed to capacity building of IAEA inspectors, but also raised awareness of the IAEA safeguards system among domestic operators. In addition, starting 2018, KINAC/INSA guarantees full and complete support for the IAEA SSAC education program that is tailored to safeguards workers from new comer countries. Following an earlier authorization in bulk analysis in 2012, ROK obtained another authorization in particle analysis from the IAEA-NWAL in 2015. With this technical advancement, ROK has actively carried out analyzing environmental samples, which allows ROK to make a greater contribution to the verification of nuclear activities around the world. ROK also attaches importance to technical development on safeguards. Through the MSSP, ROK has not only supported MOSAIC project, but also been active in developing inspection equipment.

TABLE II. On-going ROK Tasks

Task	Subject
B1872	Advanced Comprehensive Inspection Exercise at CANDU&LWR Facilities
B1895	Comprehensive Inspection Exercise at Bulk Handling Facilities
C1885	Contribution to a Safeguards Technical Report on Pyroprocessing
A1894	MSSP Umbrella Task: Support for Instrumentation Technology Foresight
B1907	Development of Virtual Training for Bulk Handling Facilities
C1953	Trilateral safeguards and security working group (SSWG) under the USA/ROK Joint Fuel Cycle Study (JFCS)
D2107	Developing Business Capabilities for the Modernization of SG Information Technology(MOSAIC)
B2217	Pyroprocessing Course at an Engineering Scale Demonstation Facility
B2242	Creation of elearning modules, supporting the preparation of state declared information
B2244	Natural language processing - investigative tooling and databases
C2263	Development of SGs measures and equipment for a pyroprocessing plant using related facilities(PRIDE, ACPF & DDFD in ROK)
X2265	Analysis of Environmental Samples supplied by the IAEA
C2325	Update of the Physical Model
C2333	Analysis of Environmental Support for the 2018 Safeguards symposium
B2340	State System of Accounting for and Control of Nuclear Material(SSAC) Course for Newcomer States

ROK is supporting it in various field such as SG approaches, training, information management, analytical services and so on. Among them, Training takes up many parts in the ROK support programs.

2.2 Introduction to the Development & Implementation Support Program for Nuclear Verification 2018–2019

The purpose of this biennial document, D&IS Program for Nuclear Verification, is to inform the inspectorate, Member States, and other contributing organizations and stakeholders about the efforts of the IAEA Department of Safeguards in terms of development activities and needs for additional support for the implementation of safeguards in a manner which is effective, efficient and encourages innovation and excellence. For some development activities, the resources to implement the D&IS Program come from the Department itself. For many development activities and for some implementation activities where expertise and financial resources are not available, support from the MSSPs, including through extra-budgetary contributions from respective Member States, remains essential. The full implementation of the Nuclear Verification Program would not be possible without the transfer of technology, expertise, and resources through the MSSP mechanism. The biennial D&IS Program describes the scope of the Department's development and implementation activities that require support and provides a better understanding of where assistance is required to meet current and emerging safeguards needs.

1. D&IS Program Objectives

The IAEA has prepared its D&IS Program for the biennial period 2018–2019 to prioritize tasks, define key deliverables, and inform MSSPs and Safeguards Departmental resource allocation decisions in the context of the Safeguards Department's total work portfolio. The D&IS Program aims to meet both short-term needs and others that are part of longer-term R&D planning. It is driven by Departmentally-identified strategic needs, which are assessed against basic scientific information, advances in technology and research, IAEA experience associated with specific safeguards implementation, and changes in the operating environment. Each of the D&IS Program project plans that follow aim to:

- Describe specific short-term D&IS needs and priorities by project area
- Help stakeholders to understand the necessity and significance of new task requests with relevant context and background information
- Inform Departmental and MSSP resource allocation decisions

2. D&IS Program Scope

This D&IS Program endeavors to describe all development activities being undertaken within the Safeguards Department in each Project area, regardless of the funding source. This is an important part of ensuring that stakeholders have a complete picture of relevant work towards a given objective. This, in turn,

will help stakeholders to understand where their contributions can make the greatest impact, by complementing existing efforts, helping to initiate activities in under-served areas of need, and avoiding duplicative work.

3. Program and Project Management

Coordination of D&IS activities is carried out by the Safeguards Department's Division of Concepts and Planning. For the D&IS, the Department has identified 24 projects to meet current and emerging safeguards needs. One project was discontinued and one newly created as "Significant changes". The execution of the program is performed through tasks planned within each of the 24 D&IS project plans that are described in the main body of this document. For tasks involving MSSPs, the work is performed through Support Program tasks. Each task has an IAEA and MSSP representative assigned to oversee the work. 24 projects are as below;

- DA of Nuclear Materials, Environmental Sample Analysis Techniques, Analysis Support & NWAL Coordination, Safeguards Approaches, Strategic Planning and Partnerships, Quality Management, Training, Satellite Imagery Analysis, Information Analysis, Evaluation of Data from Environmental Sampling and Material Characterization, Statistical Analysis, State Declared Information Management, Information Security & Infrastructure, Information Systems and System Usability, Safeguards System for JNFL MOX Fuel Fabrication Plant, Fukushima Dai-ichi Safeguards, Chernobyl, JCPOA Implementation, NDA Techniques, Improved Techniques & Instruments for Sealing & Containment Verification, Surveillance Techniques, Instrumentation Technology Foresight, Unattended Measurement Techniques, Remote Monitoring and Data Processing Systems

3. Conclusion

Currently, ROK is currently conducting research cooperation with IAEA in 7 out of 24 projects, and will further expand its business scope through continuous discussion and D&IS analysis. The IAEA also will continue to rely on MSSPs to provide the necessary technology, expertise, and resources to meet its research, development and implementation support needs. With respect to the management of the D&IS Programme, the Safeguards Department intends to pursue its policy of continual improvement. Efforts to maintain and extend existing partnerships and identify new ones will be continued for the benefit of the Agency's successful implementation of the verification mandate.

REFERENCES

- [1] Development and Implementation Support Programme for Nuclear Verification 2018-2019