

Planning of Midium- and Long-Term Strategy for the Safeguards Technology Development

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Notice: the details for the Safeguards Strategy will be presented by KNS Poster.

1. Introduction

In Rep. of Korea, active safeguards technology development suitable to phase of a nuclear advanced country is necessary because of below reasons.

First reasons are “6th ranked position in the nuclear energy generation all over the world”, “continuously increased outcomes in the various nuclear fields such as research or patent”, “strengthened intention of the new government for nuclear industries”, and “weakness of the R&D foundation related to the safeguards technology”.

Second reasons are optimization necessity of the effectiveness and efficiency of safeguards according to enlargement of the SSAC (State Systems of Accounting for and Control) role. The reason of the enlargement of the SSAC is IAEA IS (Integrated Safeguards) application for Korea.

Third reasons are necessity for the systematic national development plan considering the Korea R&D level and the degree of the difficulty of technology. This is to say, there is necessity of the system construction of safeguards technology development connected to the NuTRM(Nuclear Technology Road Map), integrated national nuclear energy promotion plans because of necessity for concentration of the technology level and development abilities which are spread in the industry fields, the academic world and research fields.

So, in this study, the foundation of the advanced safeguards technology is provided through determining the priority of the individual technology of National Safeguards, establishing development strategy for the middle or long term of Safeguards technology, based on domestic and foreign status.

2. Method

The procedure for this study is shown on Fig. 1.

2.1. Technology definition and classification

First step to do this study was technology definition and classification. Safeguards technology means the series of technology for the peaceful usage of the nuclear energy and this technology generally include “non-destructive analysis technology”, “destructive analysis technology”, “containment and surveillance”, “information analysis”, and “integrated management technology”.

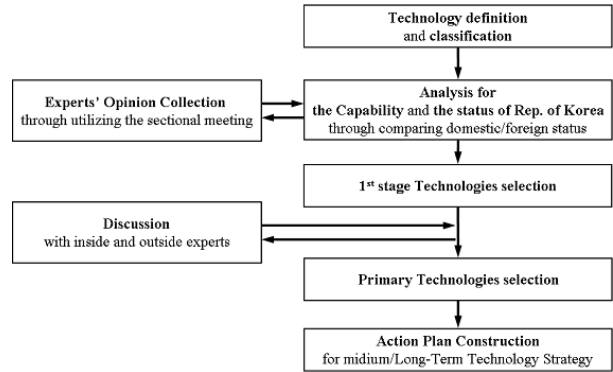


Figure 1 Procedure for Action Plan Construction

2.2. Capability and Status Analysis

Second step is Analysis for the Capability and Status.

To analyze the capability and status of our country, the questionnaires for each technology were provided to the sectional expert's groups. Sectional expert's groups were composed of two parts for various safeguards technologies. Each part is following.

- subcommittee: feedback and analysis for individual safeguards technology
- evaluation committee: feedback and analysis for final safeguards road map

Through exchanging questionnaires and answers with each others, the some technologies were selected, called as 1st stage technologies. Those were for 3 fields, and each is following.

- NDA (non-destructive analysis technology)
- DA (destructive analysis technology)
- C/S(containment and surveillance)

And for those technologies, the capability and status of our country was analyzed comparing that for inside and outside of the country. The raw data (or materials) were composed of two categories shown below.

- Domestic technologies: analysis for the safeguards R&D reports and related materials which were done by KINAC and related institute
- Foreign technologies: analysis for the safeguards R&D reports and related materials which were done by expert institutes such as IAEA, ESARDA, etc.

2.3. Primary Technologies Selection and Action Plan Construction

The raw data (or materials) were refined by utilizing these expert's groups for these technologies (3 parts).

At the next step, primary technologies were chosen through technical and advisory meetings with subcommittee and evaluation subcommittee. Primary technologies were to be developed by our country as possible as fast.

Finally, based on these technologies for 3 parts, detail development action plans were constructed.

3. Conclusions & Application

Primary technologies were selected and the national safeguards technology development action plans (5 stages and 15 years for 3 parts) were constructed.

3 parts of the safeguards technologies are following.

- NDA (non-destructive analysis technology): 6 essential technologies including underwater nuclear fuel measurement, superconducting phase shift sensor development technology, etc.

- DA (destructive analysis technology): 8 essential technologies including Radiation detection technology, TXRF technology, etc.

- C/S (containment and surveillance): 7 essential technologies including battery technology, sensing technology, etc.

As results, our national safeguards R&D will be able to be promoted by this development action plans for various technologies. Also, the action plans can be used practically in the construction of the management system for the safeguards technology R&D. Finally, the international reliability for our national nuclear non-proliferation system will be able to be improved more and more.

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