Identification of Requirements for Safeguards Inspection Supporting Program based on Domestic Regulation and CIOSP

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Background

- The ROK has been conducting independent national inspection since 2015
- KINAC is performing independent national inspections to domestic nuclear facility based on a domestic notification(NSSC No. 2017-83)[1]
- However, current national inspection adopts IAEA's book examination, inventory verification and sampling plan for on-site verification
- Independent inspection supporting program for domestic nuclear safeguards has to be developed

Objectives

- Identify functional requirements for domestic inspection supporting program based on domestic regulation and IAEA's program (CIOSP)

Inspection supporting program

- On-site handheld program which supports IAEA inspection on its member states
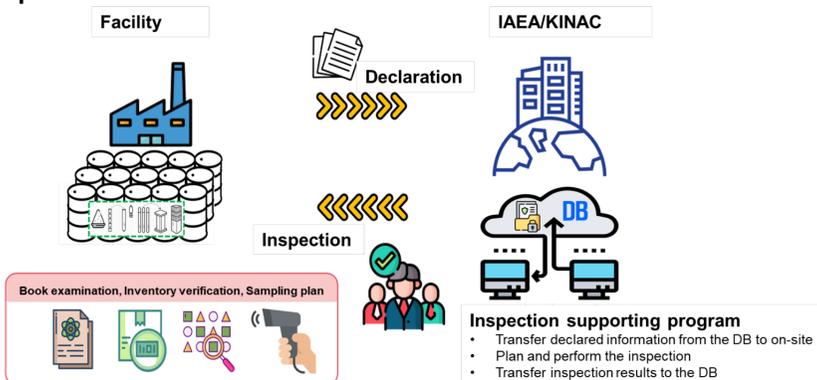
Domestic regulation

- Article 4 of NSSC notification no. 2017-83 specifies the range of national safeguards inspection[1-5]

1. Verification of operator's accounting report (ICR, MBR, PIL)
2. Verification of operator's declared information
3. Verification of operator's measurement system
4. Use of containment and surveillance system
5. Examination of operator's accounting records (LII)
6. Examination of operator's design information questionnaire
7. Examination of material balance areas and key measurement points
8. Verification of the material unaccounted for and shipper receiver difference
9. Examination of operator's material accounting system
10. Performing additional process required for inspection (i.e. sampling)

- Requirements for inspection supporting program
  - Book examination (1, 5)
  - Inventory verification (2, 5)
  - Evaluation of the measurement system(3, 6)
  - Sampling plan (2, 5, 10)
  - Preparation for material balance evaluation(8, 10)

CIOSP

- Common Inspection On-site Software Package
  - A program designed to support IAEA inspector's on-site inspection and manage inspection results

- CIOSP is applied to support short-notice random inspection (SNRI) and physical inventory verification (PIV) in the ROK

- Function of CIOSP in IAEA inspections

Type	Frequency	Target	Declaration
SNRI	2~3 times per year (random)	Nuclear material in storage	- Material accounting reports - Mailbox (daily) declarations
PIV	once a year (regular)	All nuclear material	- Material accounting reports - List of inventory item
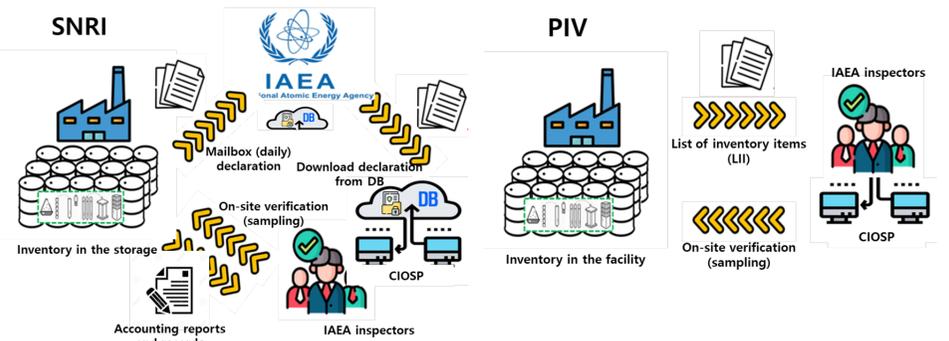
Function name	Description
Module 1	Declaration of Inspection information
Module 2	Results of book examination
Module 5	Results of comparison between book and report
Module 6	Loaded operator's declaration
Module 8	Verified LIIs and detailed information
Log-sheet	Generated log-sheet for each module (upload it to the DB in the IAEA HQ)
Stratification	Classified LII based on physical and chemical characteristics
Random sampling	Number and ID of target samples for on-site verification once the information of verification detectors is given
Mailbox verification	Summarization of the daily inventory change in the MBA during the MBP

- Requirements for inspection supporting program
  - Inspection setup (Module 1)
  - Book examination & Quality check of facilities' declaration (Module 2)
  - Inventory verification & Quality check of facilities' declaration (Module 5)
  - Management of facilities' daily declaration (Mailbox verification)
  - Management of inspection results (Log-sheet)
  - Stratification of LIIs (Stratification)
  - Sampling plan (Random Sampling)
  - Characteristics of safeguards inspection detectors(Random sampling)
  - Application of inspection results to national safeguards system

Conclusion

- Development of an inspection supporting program is required for independent national inspection

- Requirements for inspection supporting program based on domestic regulation and CIOSP
  - Inspection setup
  - Book examination/Inventory verification & Quality check of declaration
  - Management of facilities' daily declaration & Quality check of declaration
  - Evaluation of operator's measurement system
  - Stratification of LIIs
  - Sampling plan & Characteristics of safeguards inspection detectors
  - Application of inspection results to national safeguards system

References

[1] NSSC, NSSC information board > Regulation Information > Legislation Hierarchy (n.d.). https://www.nssc.go.kr/ko/cms /FR_CON/index.do?MENU_ID=950.
[2] Nuclear Safety Act, the Republic of Korea.
[3] Presidential Decree of the Nuclear Safety Act, Republic of Korea.
[4] Regulations for the Nuclear Safety Act, Republic of Korea
[5] Article 4 of NSSC regulation (No. 2017-83), Republic of Korea.
[6] IAEA SGIT, CIOSP User Manual Version 2.0, January 2018.