THE COMPREHENSIVE INFORMATION SYSTEM FOR NORM MANAGEMENT IN SOUTH KOREA

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ABTRACT

South Korea enacted the *Act on Protective Action Guidelines Against Radiation in the Natural Environment* in 2011(effective in July 2012) to protect people against exposure to radiation in a daily life. Under the Act, the target is only natural radiation such as NORM, radioactive materials contained in recyclable scrap metal, including cosmic radiation and terrestrial radiation. To manage systemically all this information regarding the radiation in the natural environment, a national management system named CISRAN was developed.
This presentation introduces the status of the development and operation of CISRAN for NORM management, which is one of the ways to provide radiation information to the public.
Keywords – NORM, Raw material, Natural radiation

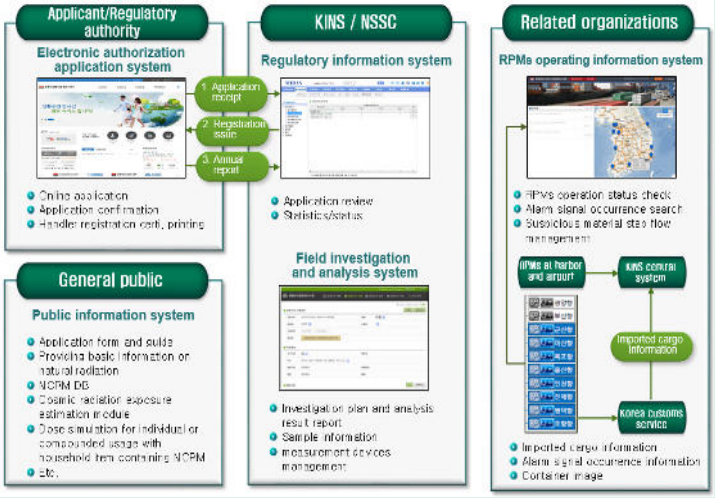
INTRODUCTION

- According to the enacted Act in 2011, the Nuclear Safety and Security Commission(NSSC) shall manage systemically all the information regarding the radiation in the natural environment such as the current status of
  - distribution of raw materials and residues/wastes
  - manufacture or export/import of products containing NORM
  - safety management of cosmic radiation for aircrew
  - etc.
- Korea Institute of Nuclear Safety(KINS), designated as a specialized institute for safety management by the act, set up a web-based system, named CISRAN(; a comprehensive information system on radiation in the natural environment).
- It is still being developed for everyone involved to be available for various and useful information and furthermore, made with the purpose of providing public safety.

Development & Operation of CISRAN

Basic concept & configuration

- **CISRAN has been developed since 2012 and started operating at 2014**
- **This system consists of three main sites**
  - Electronic authority application system
    - registration information, safety review process, issue of certification etc.
    - general public information
  - Field investigation and analysis system
    - annual plan and schedule, sample, measurement device, result report
  - Radiation Portal Monitors (RPMs) operating information system
    - as of the end of 2016, total 96 of RPMs is operating in Korea
    - effectively monitor the operation of RPMs installed at each airport and harbor and grasp information of alarms that have occurred and recorded.
- **It is used by government and other related agencies such as NSSC, KINS, KoFONS and the handlers for the raw materials or residues.**



<Business flow diagram of CISRAN>

Advanced function

NORM Database

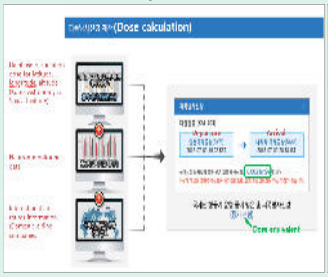
- **Raw materials and residues available on domestic markets**
  - General information about industrial raw material and usage of it
  - Type and concentration of natural radionuclides contained in NORM
  - Regulatory judgment of whether some materials are subject to the safety management or not

Cosmic radiation exposure information

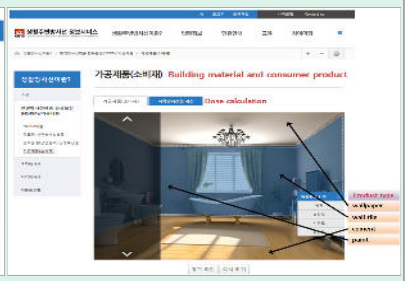
- **By benchmarking the SIEVERT of France, it is designed so that people can check the radiation dose received during a flight, by linking to CISRAN.** * joint development: KINS & KASI(Korea Astronomy and Space Institute)
  - Simply, user puts some information for point of departure and arrival, then chooses the air routes on that day provided by domestic airlines, after that, the calculated dose value automatically appears on a screen.

Consumer products usage exposure information

- **Due to the usage of building material or consumer product containing NORM, the program for calculating the radiation dose has been establishing.** * joint development: KINS & KoFONS(Korea Foundation of Nuclear Safety)
  - It is designed that when user specifies some sources such as the conditions and time of use, then the user's radiation exposure can be estimated automatically.



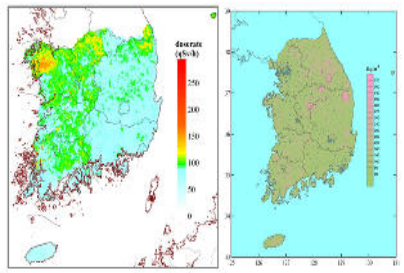
<Business flow diagram of CISRAN>



<Calculation service for dose to products containing NORMs>

Terrestrial radiation exposure information

- **In the near future, the information service on existing exposure will be provided to the public based on the collected research results. Public might get the average indoor radon concentration and value in their living area.**
  - In Korea, the researches on estimating the potential risk for the existing exposure have carried out for many years, to protect the public to the existing exposure.
  - KINS completed the technology development for detecting and mapping the national background terrestrial radiation and has surveyed the concentration of radon in the existing dwellings and buildings.



<Total dose rate with terrestrial radiation (left) and concentration of radon (right)>

CONCLUSIONS

- **With various highly functional items, CISRAN has been improving to make much more various information served. Furthermore, it is expected to use for the purpose of technical basis for decision-making related to radiation in the natural environment.**