



RASIS; RAdiation **S**afety Information **S**ystem

START; Source **T**racking **a**t **R**eal-**T**ime



Korea Institute of Nuclear Safety



RASIS

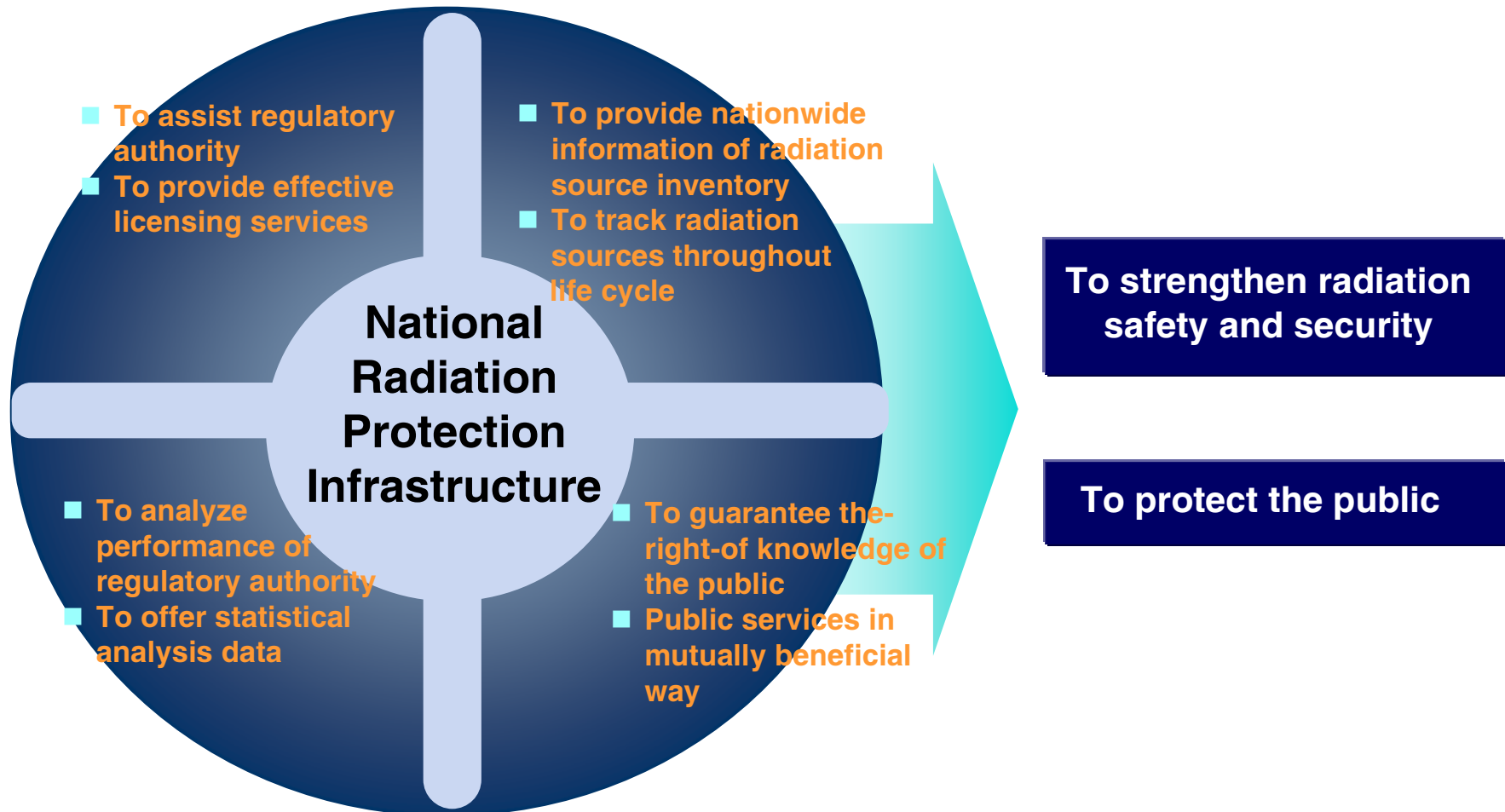
(Radiation Safety Information System)

Background

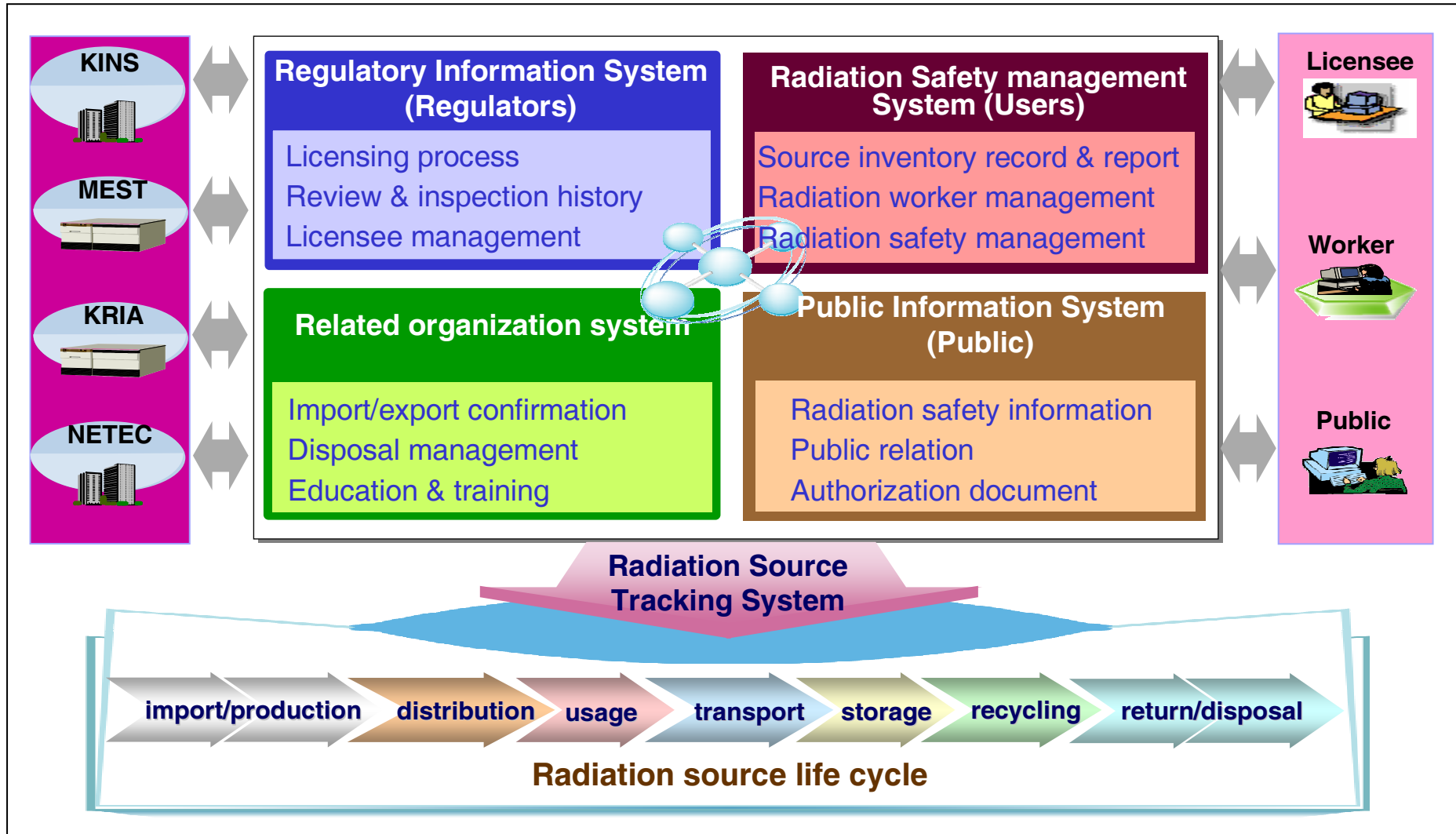
- ❑ **Increased Risk of Exposure from Radiation**
 - increased events in various work area: theft, missing, overexposure
 - facing unexpected exposure potential in resident area:
orphan sources, malicious use of radiation
- ❑ **Inefficient Control of Radiation Sources**
 - ▮ various bodies and organizations related to source control
 - ▮ thousands of user, variety of radiation sources
- ❑ **Inefficient Indicators for Decision Making Process**
 - ▮ demand practical indicators for regulatory activities
 - ▮ insufficient regulatory resources to manage increasing users
- ❑ **Lack of Public Acceptance**

Objectives

RASIS is an internet-based information system to support the regulatory control of radiation sources and nuclear materials

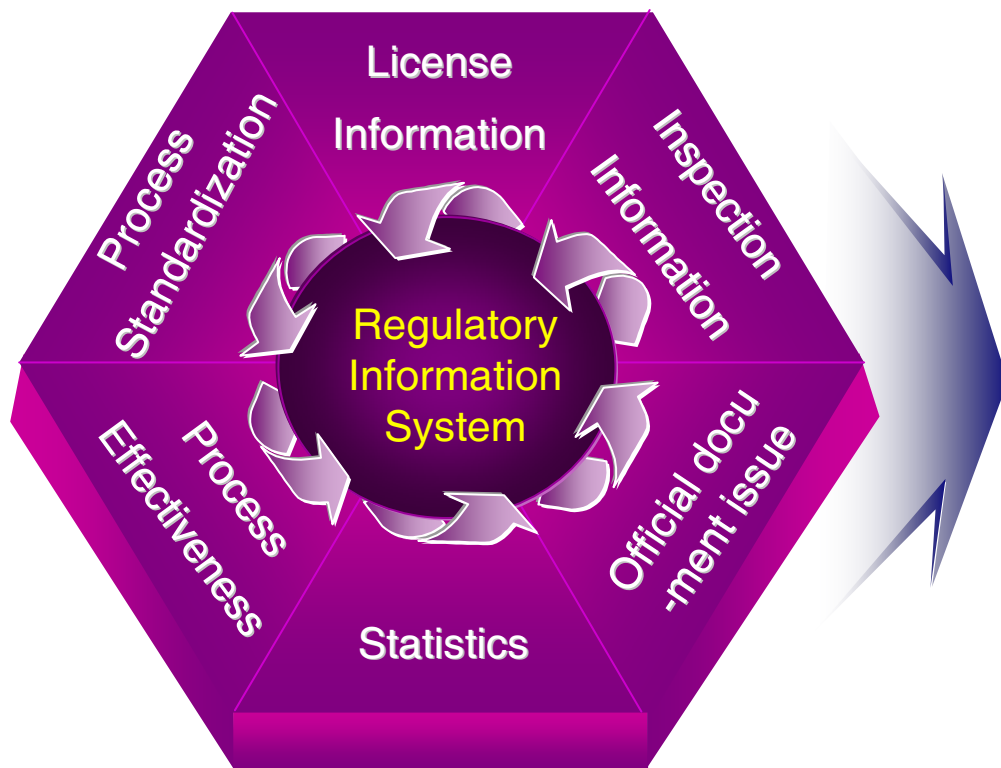


Structure of RASIS



Regulatory Information System

- Operated since 1999
- User : Regulator (MEST/KINS)
- Features

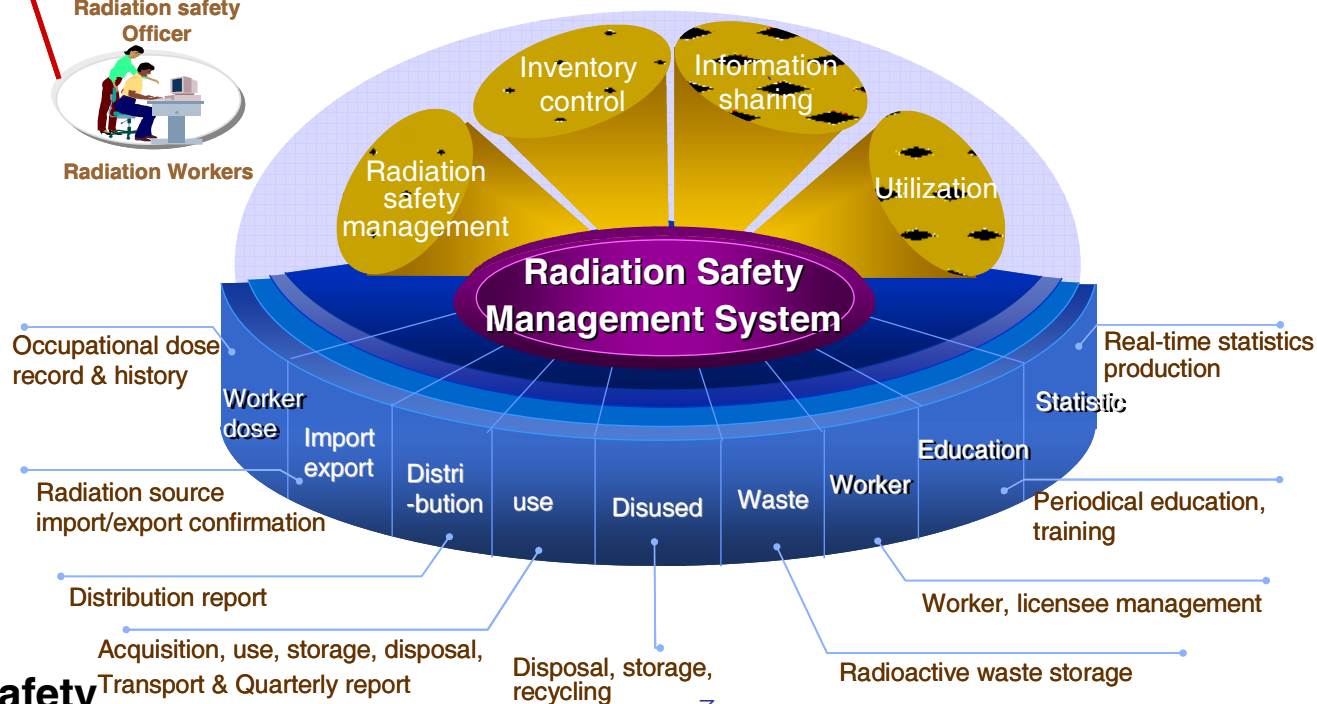
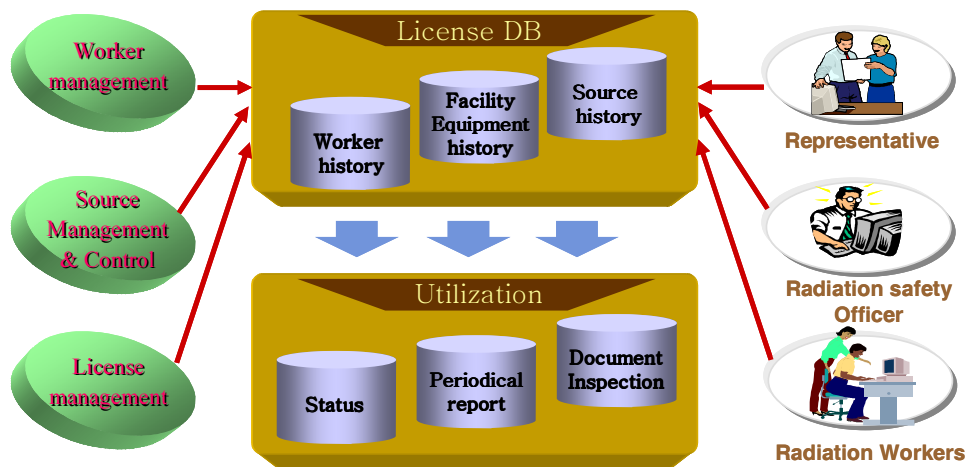


Licensing work	<ul style="list-style-type: none"> ● Review of RI license application ● History of RI license ● Transportation
Inspection	<ul style="list-style-type: none"> ● On-site inspection support ● Inspection check list
Statistics	<ul style="list-style-type: none"> ● Real-time statistics data production ● Process analysis data production
Procedure	<ul style="list-style-type: none"> ● Standardization ● Simplification ● Effectiveness
Official Document	<ul style="list-style-type: none"> ● Real-time document circulation ● On-line application & handling

Radiation Safety Management System

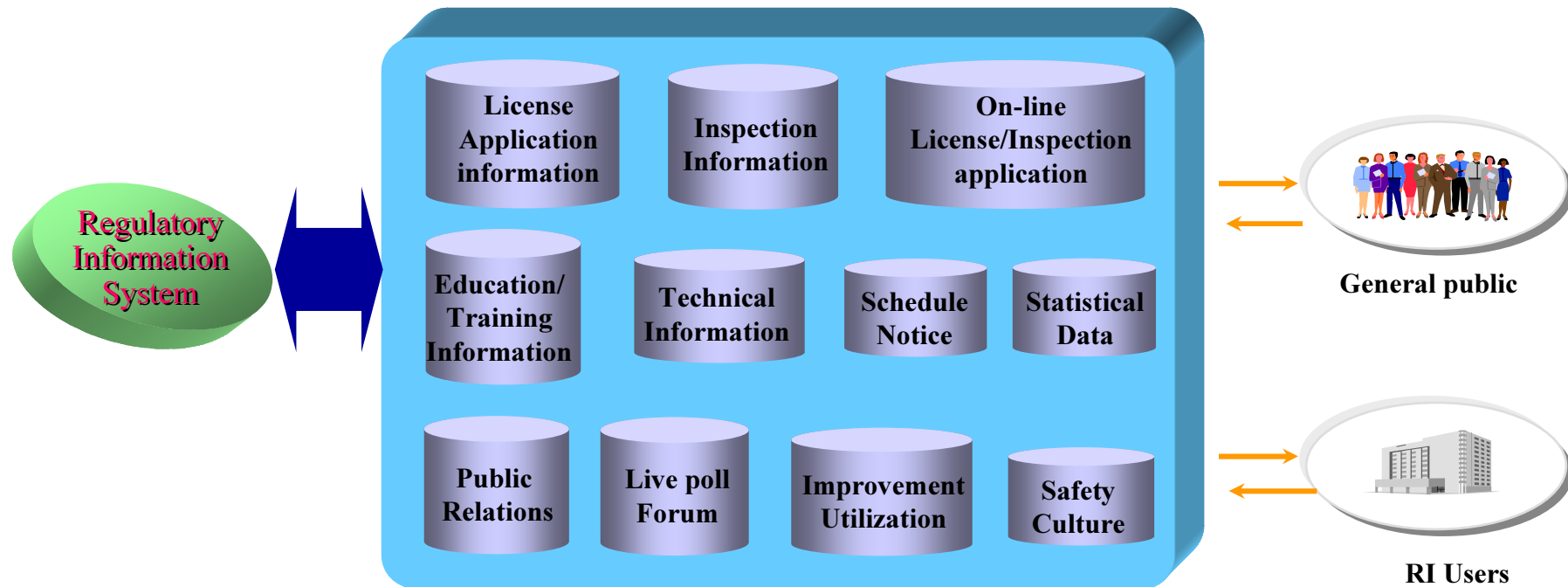
Main Feature

- Registration and report of Radiation source
- Worker and License management

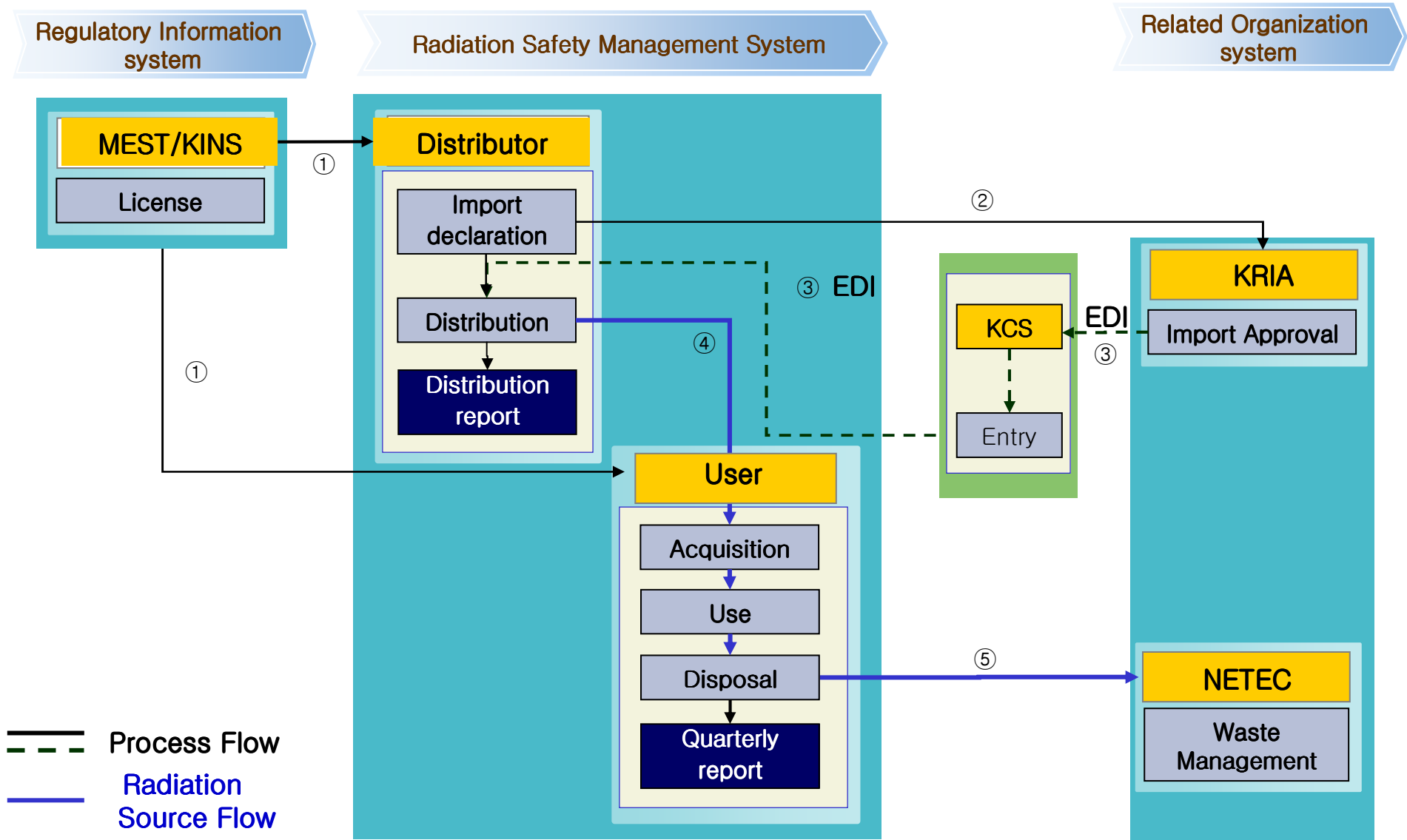


Cyber Public Information System

- Operated since 2000
- User : RI users, general public
- Main function
 - Radiation safety portal site
 - Offer radiation safety information through internet
 - Effective communication with the public



Source Management Process on RASIS



START

(Source Tracking at Real-Time)

Background

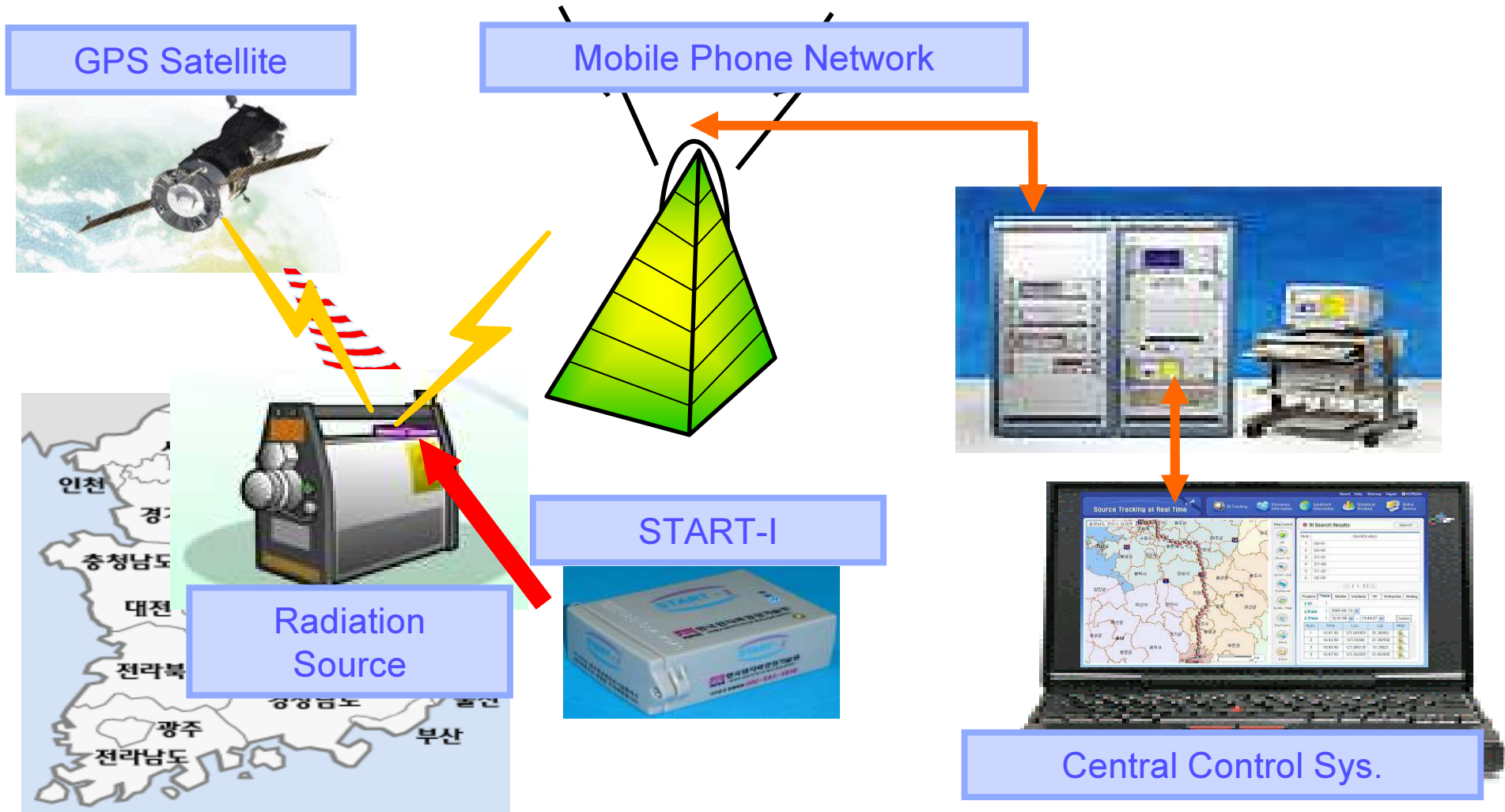
- ❖ Missed radiation source can not be detected in remote position due to its shielding.
- ❖ The only way to recover the missed source has been
 - to announce the incident to people through TV news, news paper, leaflet, placards etc.
 - and to wait a voluntary notice from someone

Needs a New System for
Radiation Source Tracking in Real-time
using Mobile phone System (CDMA)
and Global Positioning System (GPS)



"Radiation is
too DANGEROUS
to use!!!"

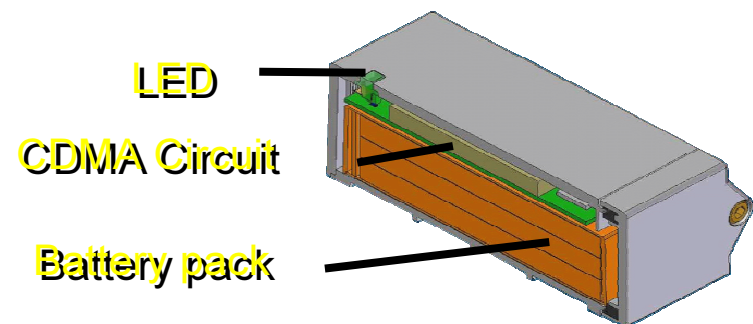
Real Time Tracking System



Mobile Station (Start-I)

- ❖ START-I consists of
 - GPS integrated cellular phone circuit
 - RF signal generation circuit
 - bar-type GPS & cellular phone antenna
 - large capacity battery pack
- ❖ tested for heat, coldness, vibration, drop, water resistance, and radiation

Items		Specifications
Dimension (mm)		81 x 58 x 29
CDMA	Processor	MSM6050
	Protocol	CDMA 2000 1x
GPS Type		gpsOne
RF	Signal	Morse code
	Frequency	150.3 MHz
Battery Pack	Capacity	5600mAh@3.7V
	Durability	3weeks
Antenna		CDMA+GPS
Water Resistance		≥ 1hr in 1m



Central Control System

- ❖ Uses 1:5,000 scale digitized map
 - 1:1,000 scale for downtown
- ❖ Location information of START on a real-time basis with good precision
- ❖ Displays location information and transfer route of any radiation sources with geological information
- ❖ Can request START to collect and send its status information and GPS data
- ❖ Can order START to generate RF signal

GPS 방사선원 위치추적 관리시스템
Source Tracking at Real Time

간라북도 무주군 설천면

고도데이터 (FMAP 1:200)

선택	번호	조사기	보관	위치	무제도
<input type="checkbox"/>	1	3537 (한국공업)			부지도
<input type="checkbox"/>	2	3639 (한국공업)			부지도
<input type="checkbox"/>	3	3758 (삼영검사)			부지도
<input type="checkbox"/>	4	3803 (아거스)			부지도
<input type="checkbox"/>	5	3830 (한국공업)			부지도

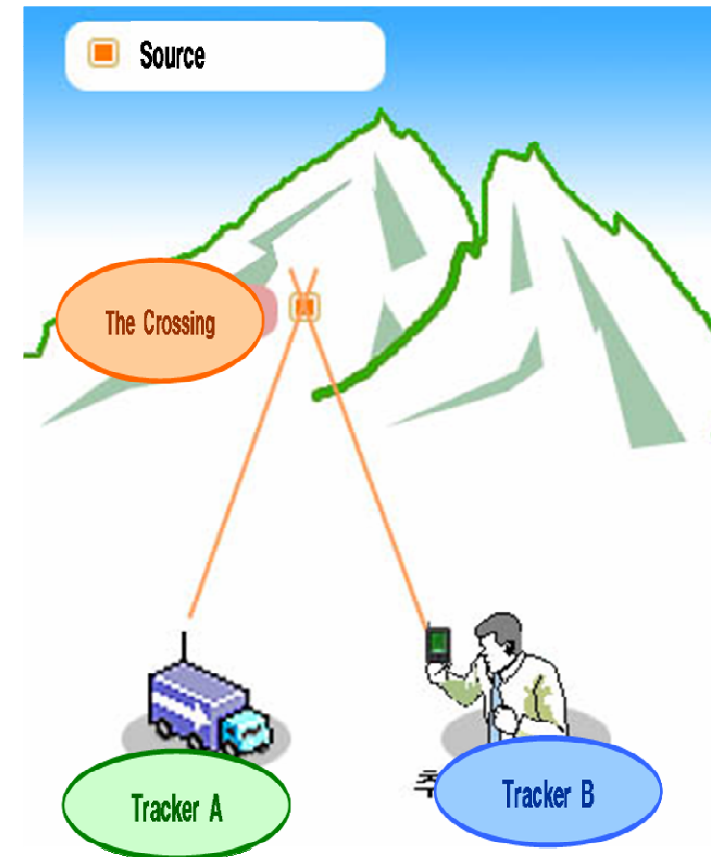
이동경로 위치 단말기 조사기 방사선원 업체 환경상황

조사기를 선택하...

Tracking Method

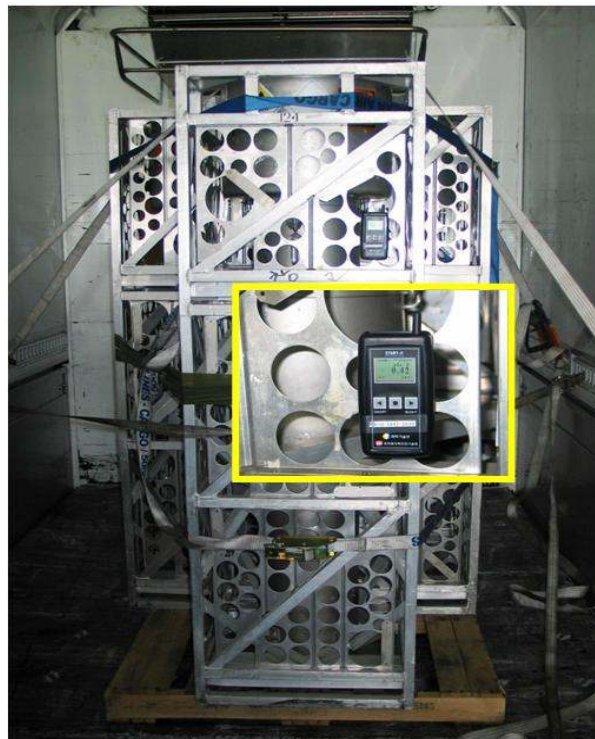
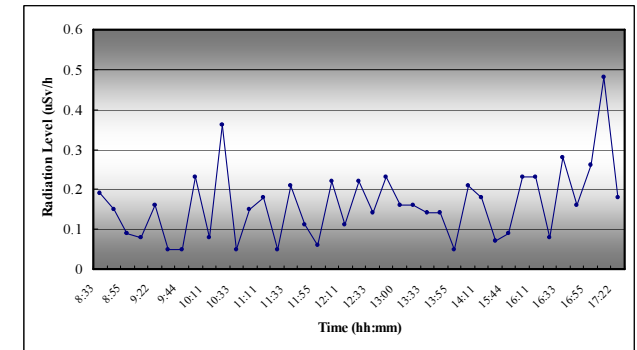
Uses Radio Frequency Signal (RF)

- START-I has circuit for RF generation
- It can generate RF signal on the order of Central Control System
- Because the order from central control system can be transmitted only where mobile phone can work, the method can be used after cell ID tracking
- RF signal can be detected in few hundreds meters from START-I with exclusively designed survey antenna that enables us find out the direction of the source



Start-II (Radiation Level Monitor)

- To ensure radiation source safety
 - ✓ through periodically radiation level monitoring
- To check the source condition
 - ✓ such as an accident of source leave away from its shielding material



Research Reactor Fuel Transport



Thank you

For your attention

