

# Overview of Nuclear Security Regulatory Framework in Japan

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# Atomic Energy Basic Act and Related Acts

## Atomic Energy Basic Act

### ○Purpose

This Act aims to secure energy resources in the future and achieve the progress of science and technology and the promotion of industries by encouraging the research, development and utilization of nuclear energy, and thereby contributing to the improvement of the welfare of human society and of the national living standard.

### ○Basic Policy

The utilization of nuclear energy shall be limited to peaceful purposes, shall aim at ensuring safety, and shall be performed independently under democratic administration, and the results obtained shall be made public so as to actively contribute to international cooperation.

## Related Acts

### ○Nuclear Regulation Authority

The Nuclear Regulation Authority shall be established to ensure safety in the utilization of nuclear energy as separately prescribed by law.

### ○Control over Nuclear Fuel, Nuclear Reactors, etc.

Regulations on the control over Nuclear Fuel, Construction of Nuclear Reactors etc. and prevention of radiation hazards shall be separately prescribed by an act.

# Affairs under the Jurisdiction of NRA (regarding Nuclear Security)

## Atomic Energy Basic Act (Abstract)

- ✓ The NRA shall be established under the Ministry of the Environment as its external organization, as separately prescribed by law, to ensure safety in the Utilization of Nuclear Energy.



## Act for Establishment of the NRA (Responsibilities for Nuclear Security)

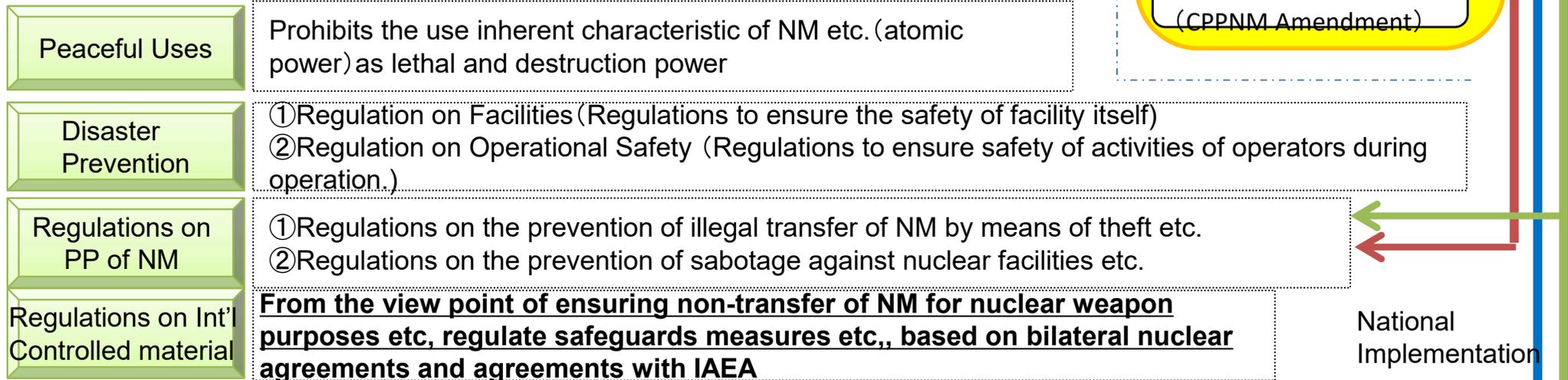
- ✓ Affairs concerning refining activities, fabricating and enrichment activities, interim storage activities, reprocessing activities and waste disposal activities concerning nuclear energy, as well as regulations on reactors, and for otherwise ensuring safety in relation to these.
- ✓ Affairs concerning the regulations on the use of nuclear source material and nuclear fuel material, and for otherwise ensuring safety in relation to these.
- ✓ Affairs concerning the protection of nuclear fuel material, radioisotopes and other radioactive material.
- ✓ Affairs concerning the adjustments of affairs of the relevant administrative organizations regarding the physical protection of nuclear fuel material and other radioactive material.

# Overview of Legal Framework for Nuclear Security

## Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors(Reactor Regulation Act)

### ○Objectives

To provide necessary regulations on refining, fabricating, interim storage, reprocessing and waste disposal activities, as well as on the installation and operation etc. of reactors, while taking into consideration the possibility of large scale natural disasters, terror attacks, or other criminal acts, and also for the purpose of **providing necessary regulations on the uses of int'l controlled material** to **execute treaties or other int'l agreements** on the research, development and use of nuclear energy, in order to ensure that the uses of nuclear source material, nuclear fuel material and reactors are **limited to peaceful ones**, and at the same time, to ensure public safety by **preventing hazards** resulting from such materials and reactors, and **protecting nuclear fuel material**, thereby contributing to protecting people's lives, health, and property, preserving the environment, and assuring national security.



## Act on the Regulation of Radioisotopes, etc., etc.(RI Law)

Regulation on Radiological Isotopes, Radiation Emission Devices, etc

## Act on Punishment of Acts to Endanger Human Lives by Generating Radiation

## Penal Code

## Ship Safety Act

Regulation on sea transport of RM

## Civil Aeronautics Act

Regulation on air transport of RM

(      : Safety regulations on the peaceful use of nuclear energy)

# National Framework for Nuclear Security

International Cooperation	Regulation			Response to Emergency / Contingency
	Nuclear Fuel Material Nuclear Facility	Radioisotope	Transport	
<b>Ministry of Foreign Affairs (MOFA)</b>	<b>Nuclear Regulation Authority (NRA)</b> ✓ Division of Nuclear Security: Protection of nuclear material ✓ Division of Radiation Regulation: Protection of RI			<b>CAS</b> Cabinet Secretariat
				<b>MOD</b> Ministry of Defense
	<b>MLIT</b>		<b>MLIT</b>	<b>FDMA</b> Fire and Disaster Management Agency
			Ministry of Land, Infrastructure, Transport and Tourism	
	<b>MHLW</b>	<b>MHLW</b>	<b>PSC at local areas</b>	<b>NPA</b> National Police Agency
		Ministry of Health, Labor and Welfare	(Local) Public Safety Commission	
	<b>MAFF</b>	<b>MAFF</b>	<b>Japan Coast Guard</b>	
		Ministry of Agriculture, Forestry and Fisheries		

# Roles for Regulations and Protection of Nuclear Material and Radioisotopes

## Police

- (National Police Agency (NPA), Prefectural Police Department)
- Onshore response with arms



## Nuclear Regulation Authority (NRA)

- Regulates PP measures for radioactive material & associated facilities



## Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

- Regulates PP measures during transport



## Japan Coast Guard (JCG)

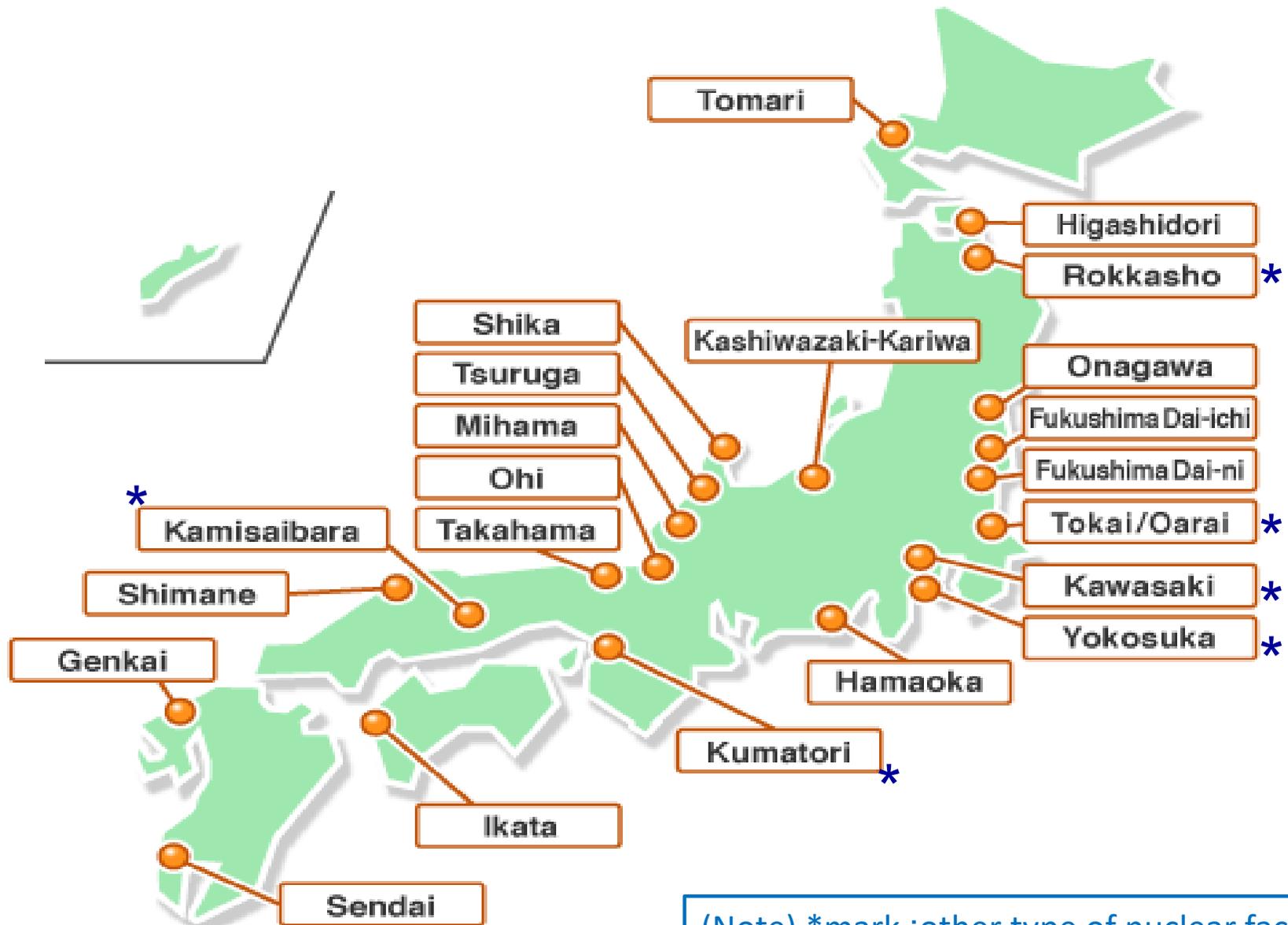
- Offshore response with arms



# Number of Nuclear Facilities in Japan

No	Facilities Type	Number of facilities	Total
1	Fabricating and enrichment facility	7	52
2	Commercial power reactor facility	17	
3	Reactor facility still in the R and D stage	2	
4	Research and test reactor facility	6	
5	Spent fuel interim storage facility	1	
6	Reprocessing of spent fuel facility	2	
7	Waste disposal facility	2	
8	Use etc. of nuclear fuel material facility	14	
9	Specified nuclear facility (Fukushima-Daiichi)	1	

# Nuclear Power Station in Japan



# Structure of the Reactors Regulation Act

Chapter I General Provisions

Chapter II Regulation on Refining Activities

Chapter III Regulation on Fabrication and Enrichment Activities

Chapter IV Regulation on the Installation and Operation of Reactors

Chapter V Regulation on Storage Activities

Chapter VI Regulation on Reprocessing Activities

Chapter VII Regulation on the Activities of Radioactive Waste Disposal and Storage

Chapter VIII Regulation on the Use of Nuclear Fuel Materials

Chapter IX Responsibility of Nuclear Operators and Other Licensees

Chapter X Regulation on Nuclear Operators

Chapter XI Supervision based on Nuclear Regulatory Inspections

Chapter XII Regulation on the Use of International Controlled Materials

Chapter XIII Miscellaneous Provisions

Chapter XIV Penal Provisions

Chapter XV Release of Foreign Vessels Subject to Security Deposit

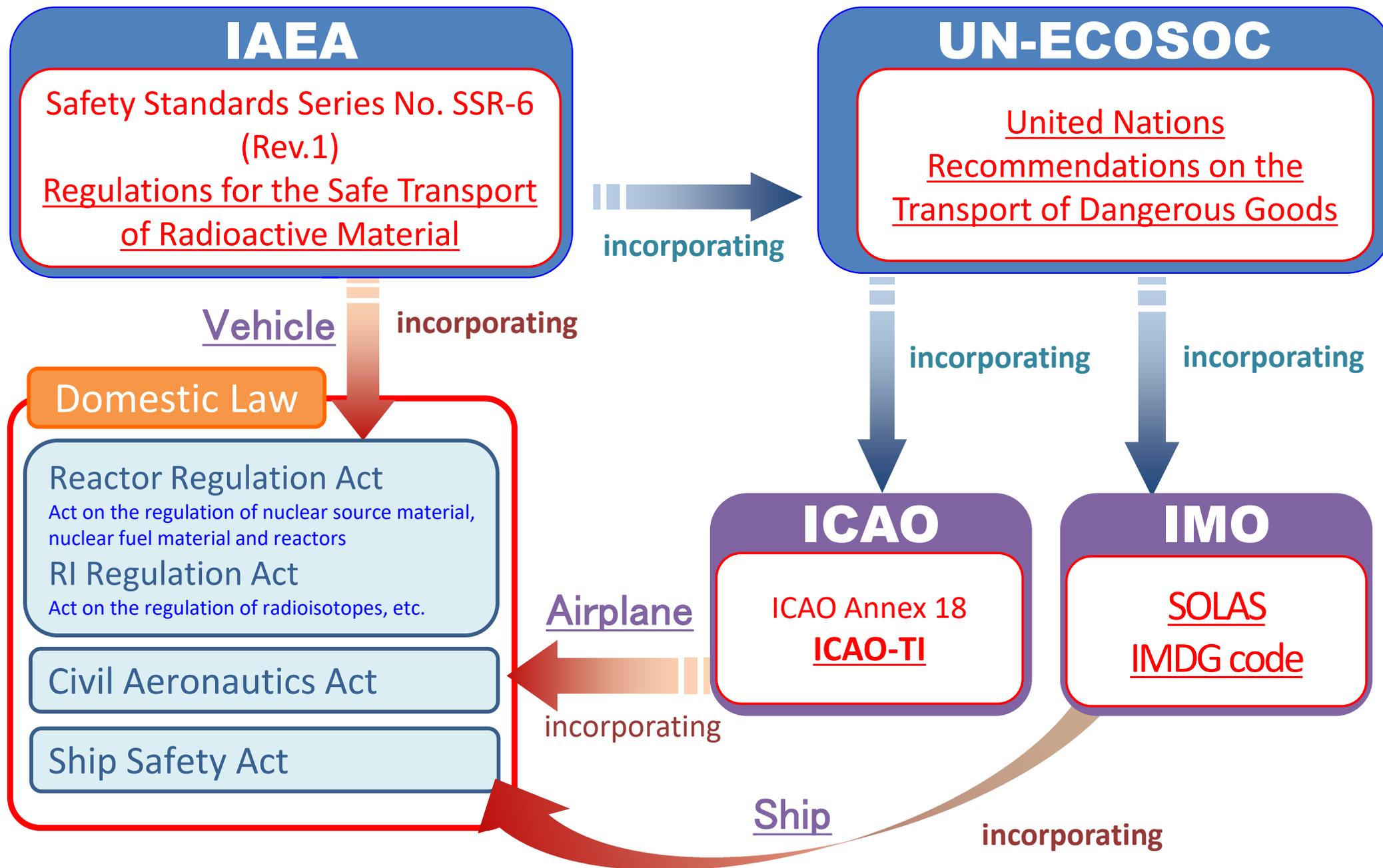
- Regulation for nuclear facilities
  - Permission and designation of activity
  - Approval of design and construction plan
  - Pre-operational inspection
- Regulation for operational safety
  - Approval of operational safety program
  - Selection of chief engineer of reactors
- Regulation for PP
  - PP measures
  - Approval of Security Plan
  - Appointment of PP manager
- Regulation for decommissioning

- Dispose/transport outside of facilities
- Storage contractor
- Restriction on transfer and reception

- Security Plan
- PP measures
- PP measures for transport

- Report
- Emergency measures
- On-site inspection
- Confidentiality obligation
- Relationship with NPA and JCG

# Incorporation of IAEA No.SSR-6 (Rev.1)



# Transportation Laws and Regulations

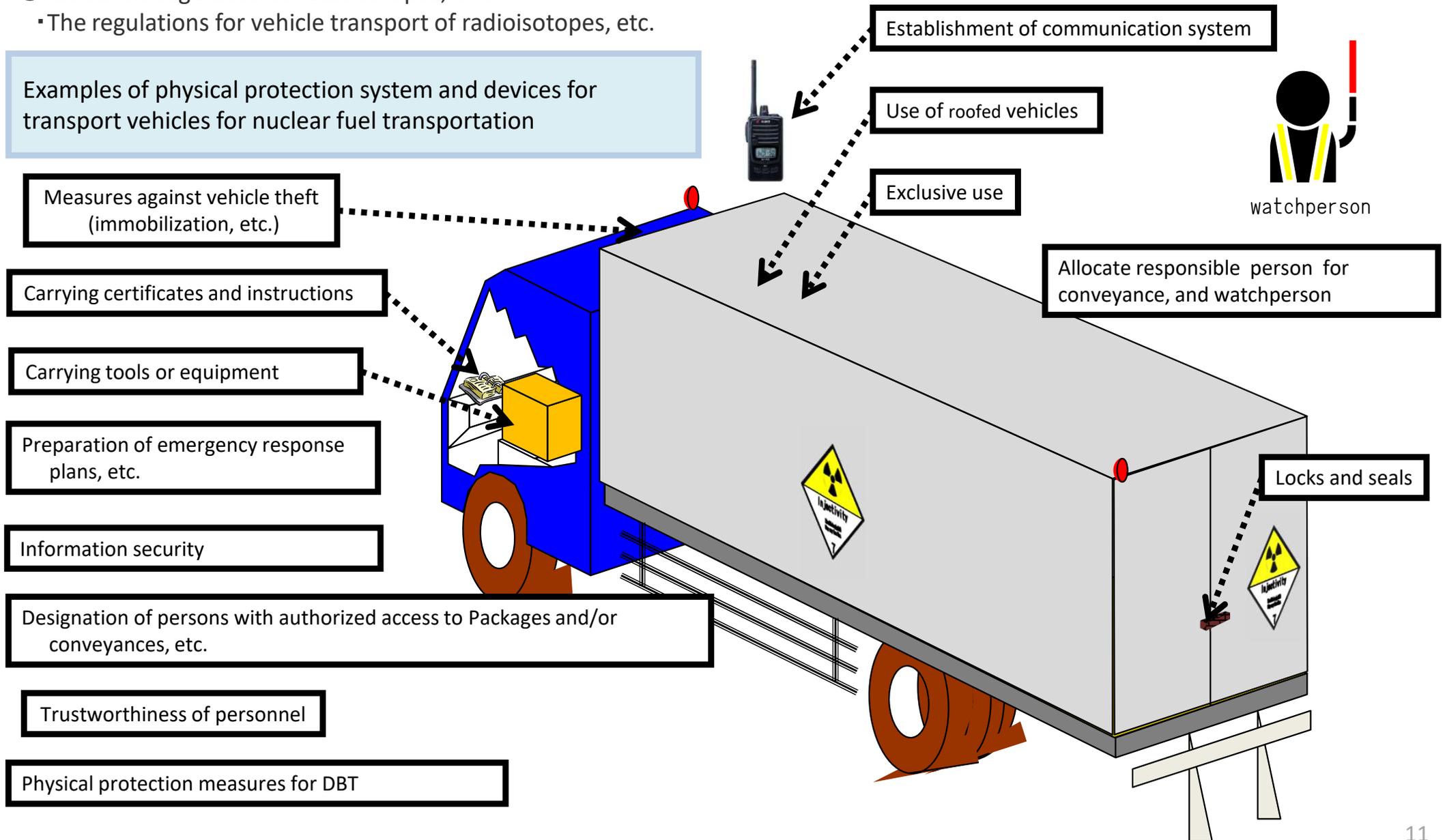
Mode	Land Transport		Maritime Transport (Package / Conveyance)	Air Transport (Package / Conveyance)
	Package	Conveyance		
Radioactive Material				
Nuclear Fuel Material	<b>Reactor Regulation Act</b> The regulations for transport of nuclear fuel materials, etc. outside plants ( NRA )	<b>Reactor Regulation Act</b> The regulations for vehicle transport of nuclear fuel materials, etc. ( MLIT )		
Radioisotope	<b>RI Act</b> The regulations of radioisotopes, etc. ( NRA )	<b>RI Act</b> The regulations for vehicle transport of radioisotopes, etc. ( MLIT )	<b>Ship Safety Act</b> ( MLIT )	<b>Civil Aeronautics Act</b> ( MLIT )
Radio-pharmaceutical	<b>Pharmaceutical and Medical Device Act</b> ( MHLW )			

➤ NPA and JCG : Ensure safety related to transportation dates, routes, etc.

# Security Measures for the transport by vehicles

- Act on the regulation of nuclear source material, nuclear fuel material and reactors
  - The regulations for vehicle transport of nuclear fuel materials, etc.
- Act on the regulation of radioisotopes, etc.
  - The regulations for vehicle transport of radioisotopes, etc.

Examples of physical protection system and devices for transport vehicles for nuclear fuel transportation



# Security Measures for the transport by ship

## ○ Ship Safety Act

- The regulations for the Carriage and Storage of Dangerous Goods in Ships

## ○ Act on Assurance of Security of International Ships and Port Facility

### “Preparation of Protection measures plan”

- Based on the threat assessment and the design basis threat
- Trustworthiness determination
- Establish Information Management Regulations etc.

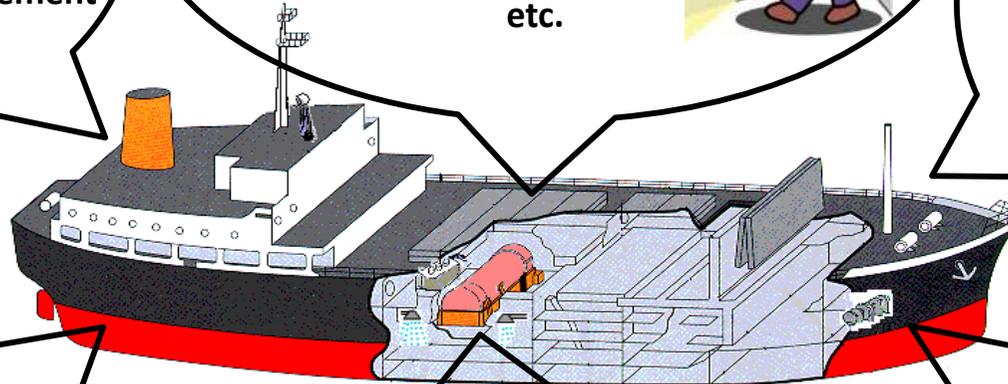
### “Allocate responsible person for conveyance and watchperson”

- Confirmation that no sabotage has been initiated before shipment etc.



### “Establishment of communication systems”

- Transport control centre (Limited to Category I) etc.



- Preparing Ship Security Plan
- Boarding of Ship Security Officer



### “Locking and Sealing”

- Locking and sealing packages and containers
- Locking the cargo hold or compartment holding packages



### “Loading and Storage Inspection”





# Progress of nuclear security regulation since the 2018 IPPAS mission

## Introduction of the RI Security Regulation

### Background: Introduction of RI regulation

- Considering the NRA's survey and the IRRS recommendation in 2016, the NRA organized the Study Team. Taking into account the output by the Study Team, the NRA presented the bill containing the RI security regulation of highly dangerous radioisotopes.
- The RI security regulation based on the bill came into effect in September 2019, which is in line with international standards (e.g., Code of Conduct, NSS-14).
- It is the first time when the RI security regulation will be reviewed by the up-coming IPPAS Mission.

### Scope of Security Regulation

- Specific Radioisotopes are defined and regulated as highly dangerous radioisotopes.
- Based on the Graded Approach, the specific radioisotopes are categorized into three groups, referring to D1-value and D2-value described in the IAEA technical document.

### Example for commonly used sources

- Gamma knife (Co-60)
- Industrial gamma radiography (Ir-192)
- Blood irradiation (Cs-137)
- Remote after loading system (Ir-192)



# Regulation by Related Acts

- The “Act on the Regulation of Radioisotopes, etc. (RI Act) and
- The “Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors” as the Act to regulate the licensee who handles radioactive materials.

## RI Act

Co-60, Cs-137, Ir-192, etc.

**Permission of use of radioisotopes and radiation generator, etc.  
(Regulation for safety and security)**

## Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors

U, Pu, Th, etc.

**Permission of use of nuclear fuel material , etc. (Regulation for safety and security)  
Permission of use of international regulatory goods (Regulation for safeguards)**

# License Classification under the RI Act

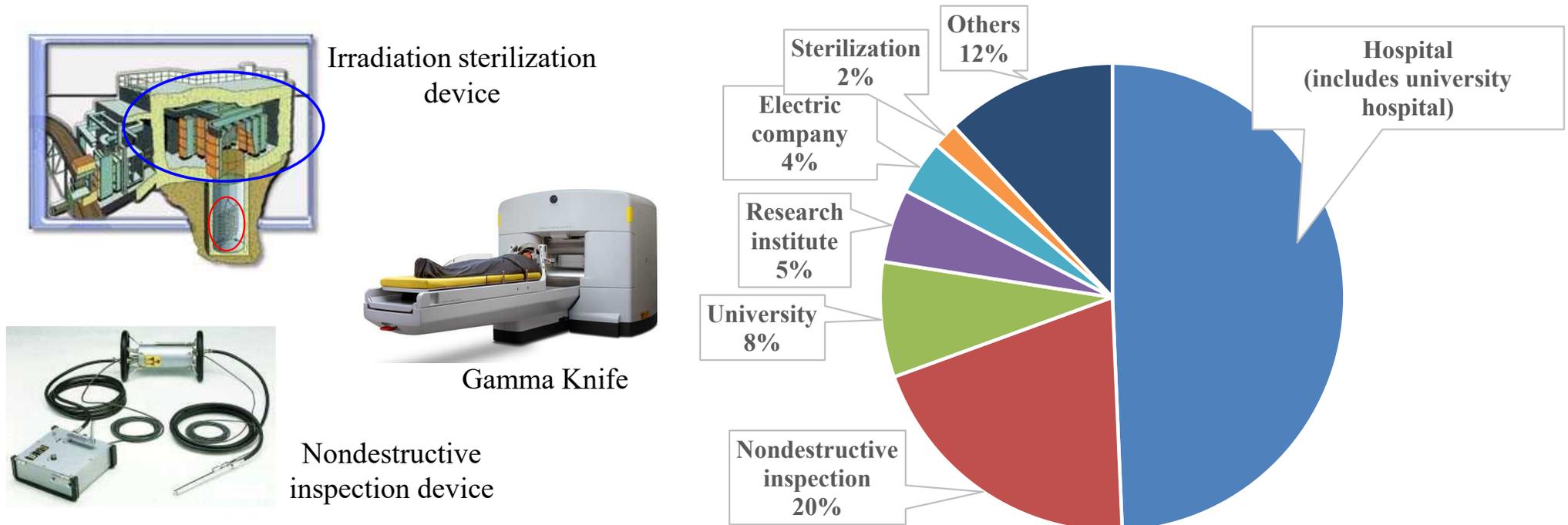
Classification (Number of licensee)		Type of license
Permission and notification user	<p><b>Specified permission user</b> (1,173)</p>  <p>Gamma knife</p>	<ul style="list-style-type: none"> <li>• Use of sealed source. (storage capacity <math>\geq 10\text{TBq}</math>)</li> <li>• Use of unsealed source. (storage capacity <math>\geq 100,000 \times \text{LEL}^*</math>)</li> <li>• Use of accelerator</li> </ul> <p>* LBL : Lower Exemption Level</p>
	<p><b>Permission user</b> (2,056)</p> 	<ul style="list-style-type: none"> <li>• Use of sealed source. (Quantity <math>\geq 1,000 \times \text{LEL}</math>) (e.g., thickness meter)</li> <li>• Use of unsealed source. (e.g., PET formulation)</li> </ul>
	<p><b>Notification user</b> (407)</p>	<ul style="list-style-type: none"> <li>• Use of sealed radioisotopes.</li> </ul>
User of approved device	(5,008)	<ul style="list-style-type: none"> <li>• Use of an approved device (e.g., gas chromatograph)</li> </ul>
Permission waste management operator	(7)	<ul style="list-style-type: none"> <li>• Waste management of wastes of radioisotopes.</li> </ul>
Notification Dealer and Lessor	(490)	<ul style="list-style-type: none"> <li>• Sale or lease of radioisotopes.</li> </ul>

As of March 31, 2023

# Target Licensees for RI Security

- The IAEA recommends that the licensees who have radioisotopes beyond the D-values should reinforce the security measures.
- **The number of licensees who have radioisotopes beyond the D-values\* are 452.** (Total No. of RI licensee is around 8,000.)

## The details of the target licensees for RI security



\*D-value : The quantity of which RI gives a fatal influence to persons during the period from several days to several weeks if not under control.

# Outline of Security Measures

