Radioactive material transport safety

France

AUTORITÉ DE SÛRETÉ NUCLÉAIRE

An important role in our societies

For example, in France…

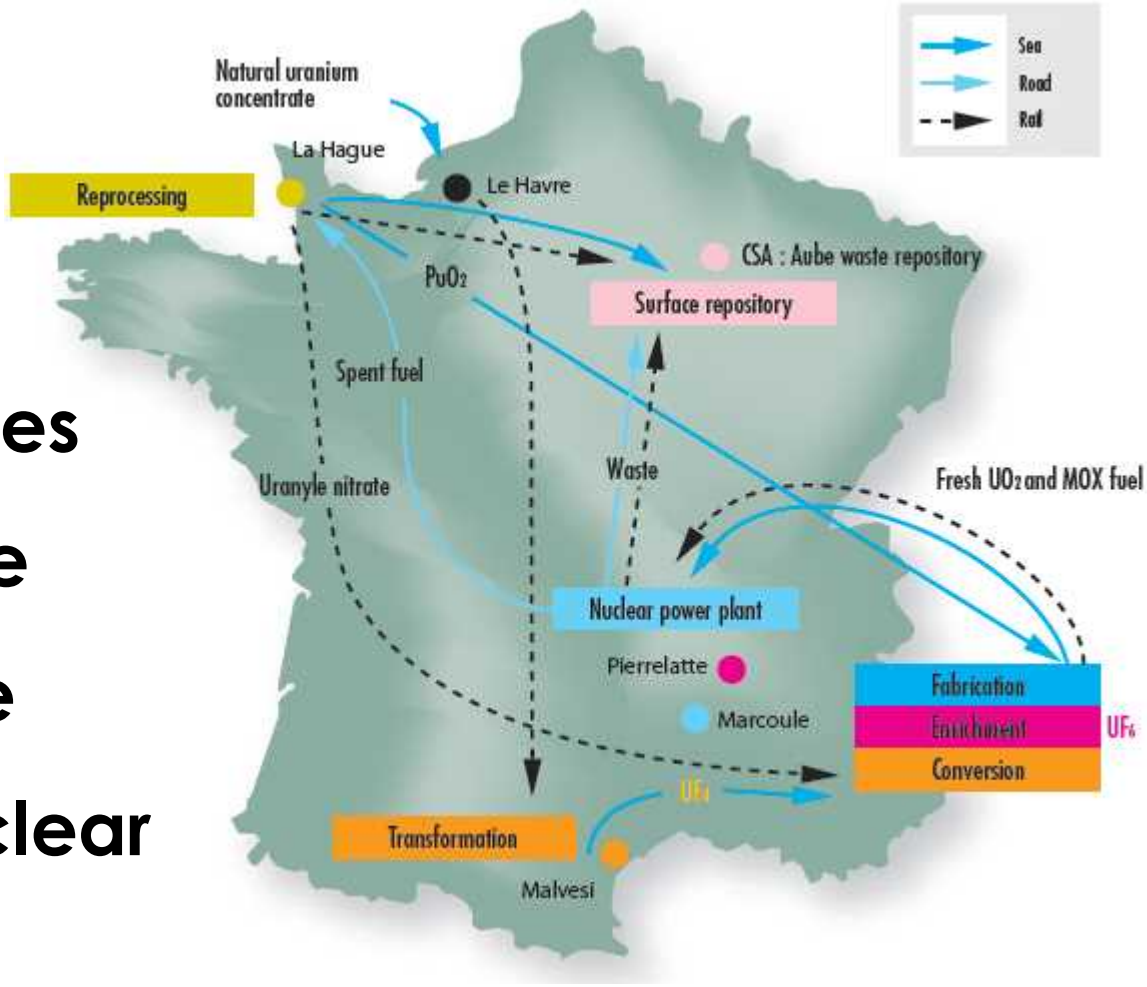
~700 000 transports

~1 000 000 packages

12% fuel cycle

30% medicine

58% non-nuclear industry



Hazards associated with transport

Radiological hazards

- Irradiation : due to ionizing radiations

- Contamination : spread of radioactive material outside the package

Criticality

- uncontrolled chain reaction (in the case of fissile material)

Hazard due to the temperature

- nuclear reactions produce heat, which can for example damage the package or the vehicle if not correctly dissipated.

Non nuclear hazards

- material can also present chemical hazards (toxicity for example)

Defense in depth

Safety of radioactive material transports is based on the concept of defense in depth: multiple independent layers of defense exist to allow an efficient protection against accident and a limitation of their potential consequences.

- 1st layer: **package robustness,** to guaranty a good resistance to incidents and accidents.

- 2nd layer: **reliability of transport operations,** to reduce the probability of incidents and accidents.

- 3rd layer: **crisis management,** to reduce to a minimum the consequence of incidents and accidents.

Package robustness

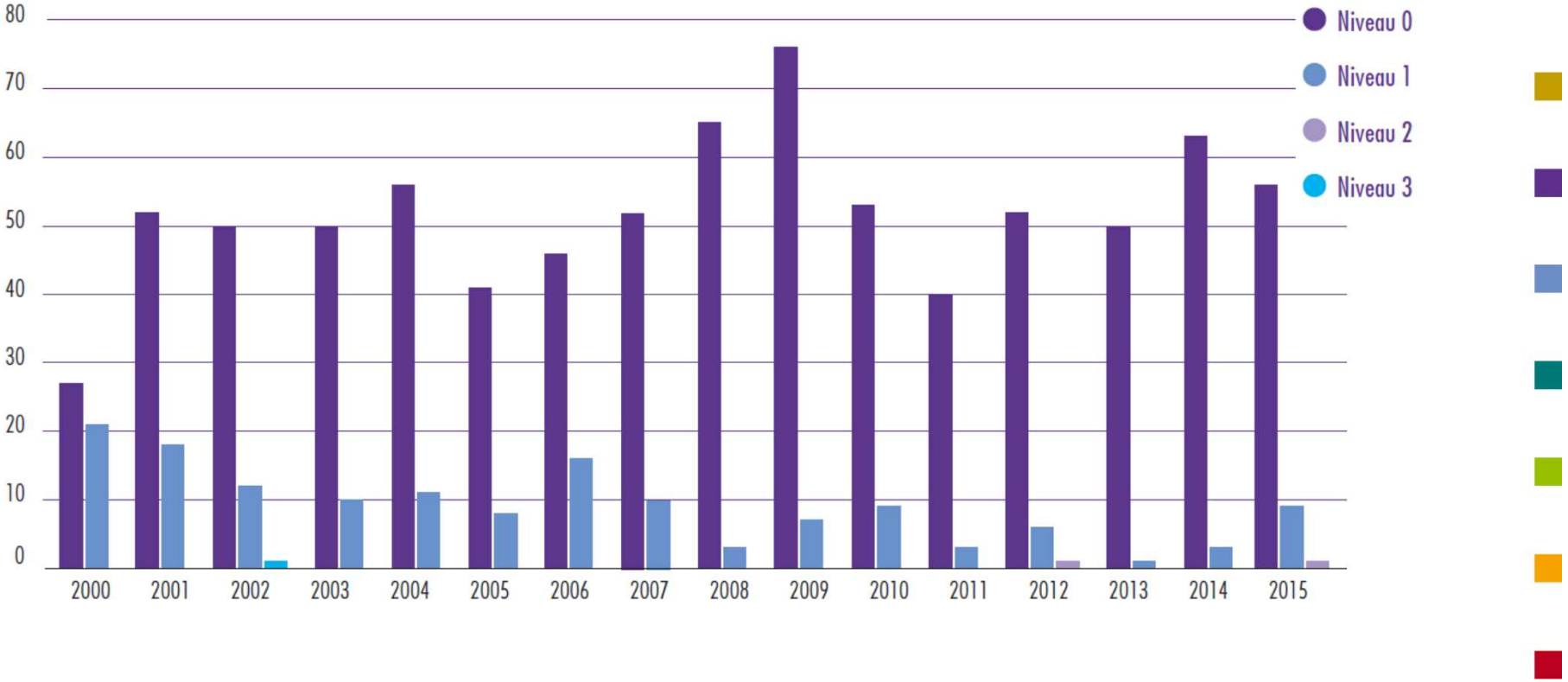
Different types of package exist for the different type of contents.

Principle of the regulation : the more dangerous the content, the more robust the package.

Content dangerousness	- → +			
Package type	Excepted package	Industrial package	Type A package	Type B package
Regulatory requirements	- → +			
	Resistance to routine conditions of transport	Resistance to normal condition of transports (small incidents)		Resistance to severe accidents

Incidents so far

Several significant incidents but without notable consequences in terms of nuclear safety or radiation protection.



An international regulation

- Transport of radioactive materials is an international activity and should then be submitted to an international regulation.

- IAEA TRANSSC comity elaborates the Regulations for the safe transport of radioactive material, current version has the number SSR-6.

- Then, each member states incorporate the SSR-6 requirements in its own regulatory framework.

Future perspectives

#1 Capitalizing on experience

Feedback of inspections and incidents and trends should be analyzed and taken into account, to:

- Make the regulation evolve as necessary
- Reinforce package designs as necessary
- Produce guidance to address frequent difficulties and promote good practices
- Adapt our inspection programs

#2 Reinforcing exchanges between competent authorities

For example: assessment of package designs, inspections, peer reviews…

#3 Increasing transparency

Competent authorities should actively inform the public (within certain limits).

Thanks for your attention!