French framework for the safety of radioactive material transport

Transport and sources department
Transport control unit

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KEY POINTS

> FRENCH REGULATORY FRAMEWORK
> FRENCH COMPETENT AUTHORITIES AND TSO
> SIGNIFICANT TRANSPORT EVENTS IN FRANCE

> SAFETY CASE ASSESSMENT FOR NEW PACKAGES
> VALIDATION OF FOREIGN PACKAGES CERTIFICATES
> RADIOPROTECTION
French regulatory framework
The transport of radioactive material in France is subject to:

- IAEA Safety & Security Publications,
- International Conventions & Codes,
- European directives & regulations.
The transport of radioactive material in France is subject to the Dangerous Goods Transport Regulations (such as the ADR, RID, ADN, IMDG code and ICAO Technical Instructions) which are consistent with the IAEA Transport Regulations (SSR-6) and in addition at least to the provisions of:

- The Public Health Code (General principles of radiation protection - Public exposure),
- The Labor Code (General protection of workers),
- The Environment Code (Public and environmental exposure),
- The Transport Code,
- The order of 29th May 2009 concerning the carriage of dangerous goods by land (called the "TMD order"),
- The instruction of 26 June 2008 pertaining to the technical rules and administrative procedures applicable to commercial air transport and regulation EC 859/2008 dated 20 August 2008 (EU OPS1),
- The order of 23 November 1987 concerning the safety of ships, attached regulation, division 411 (called the "RSN Order") and etc, ...
Completed by specific national regulations on:

- Handling of dangerous goods in ports (order of 18th July 2000)
- Risks analysis for transport infrastructures (Code of Environment)
- Protection of workers and public against the effect of radioactivity (Code of Work and Code of Public Health)
- Protection of nuclear materials against malicious acts (order of 18th August 2010)
- An order on the security of non-nuclear RAM is under preparation

**ASN also publishes guidance on its website**, for example:
- a guide on emergency plans,
- a guide on conception of packages that do not require authority approval,
- a guide on operational recommendations on stowage,
- a guide on radioprotection during transport operations.
Completed by specific national regulations on:

- ASN decision 2015-DC-0503: **obligation of notification for the companies performing the following transport operations:**
  - carriage of radioactive material packages;
  - loading or unloading of these packages;
  - handling of these packages, after loading or before unloading; when they take place, at least partially, on the French territory.

- Companies performing transport by sea or air are concerned if the carriage includes a stop in a French port or airport

- **As an exception, companies performing transport operations involving nuclear materials or high activity sealed sources must be authorized** (by the ministry of environment in the 1st case and ASN in the 2nd case).
Overview of transport of radioactive materials in France
Transport of radioactive materials for civil use in France

- 980 000 packages a year are carried in 770 000 shipments.

- Non-nuclear industry: 57%
- Medical: 31%
- Nuclear industry: 12%
- Excepted: 58%
- IP: 8%
- Type A: 32%
- Type B and fissile: 2%
TRANSPORT FLOW IN FRANCE

Transport modes

Route, 91%

Avion, 5%
Rail, 2%
Mer, 2%
Transport for the nuclear fuel cycle

- ~19,000 transports per year
- ~200 of spent fuel to La Hague
- ~400 of fresh UOx fuel and 50 of fresh MOX fuel
- ~100 of Pu powder
- ~250 of UF₆, enriched or not
Roles and responsibilities in regulating the transport of radioactive substances
ASN has been responsible for regulating the safety and the radiation protection of transports of radioactive substance for civil uses since 1997. Since 2017, ASN is also in charge of the control of security (i.e. protection against malicious acts) for non-nuclear radioactive materials (that do not contain uranium or plutonium). The Defence Nuclear Safety Authority (ASND) fulfils this role for transports relating to national defence.

ASN is responsible, in terms of safety and radiation protection, for the regulation and oversight of all steps in the life of a package:

- design,
- manufacture,
- maintenance,
- shipment,
- actual carriage,
- receipt,
- and so on.
Ministry of environment is:

- the competent authority for the security of transports of nuclear materials,
- in charge of the safety of transport infrastructures (port, airport, railway stations, etc.), in cooperation with ASN when radioactive materials are involved.

**IRSN** is ASN’s technical support organisation, which provides expertize for matters related to safety and security.
☑ Participates in elaborating the regulation of transport safety, on national and international levels

☑ ASN can make formal decisions that have a regulatory value

☑ ASN publishes guidance

☑ **Delivers the approvals** required by the regulation

☑ **Controls the transport safety** (performs 100 inspections per year at every stage of the transport). Some inspection are more focused on the companies organization, for example their management system or their emergency preparedness.

➢ ASN has inspectors specialized in transport, either part-time in the territorial “divisions”, either full-time in the transport unit in Montrouge

☑ Provides **assistance to public authorities** in the case of a transport emergency

☑ **Informs the public**
Significant events
SIGNIFICANT EVENTS

Trend in the number of significant events affecting the transport of radioactive substances notified between 2001 and 2018

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

Breakdown of significant events notified in 2018 by notification criterion

- Deterioration of a containment barrier or safety function
- Physical damage to the package or vehicle
- Regulatory irradiation or contamination limits exceeded
- Traceability fault (loss, delivery error, etc.)
- Other regulatory non-compliances
- Repetition of events constituting an early warning sign
- Other significant events
**SIGNIFICANT EVENTS**

Webservice: [https://teleservices.asn.fr](https://teleservices.asn.fr)

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Approval of package designs
Assessment of an application
BREAKDOWN OF NUMBER OF APPROVALS ACCORDING TO TYPE, IN 2018

- Special arrangement: 6
- Extension: 16
- New approval: 2
- Prolongation: 5
- Validation: 4
The applicant shall provide:

- a safety analysis report (SAR), to demonstrate compliance with all relevant ADR provisions;
- and, in the case of the renewal of a certificate, a feedback of the maintenance operations and of the use of the packages

A technical assessment of the applicant’s SAR is performed by the IRSN’s experts.

Time needed:

- For a new approval or a renewal: 12 months – in the case of a renewal, the whole SAR is reviewed
- For a modification of an existing approval: 6 months
- For the validation of a foreign certificate: 6 to 12 months

If the assessment is positive, ASN delivers a certificate, even in the case of the validation of a foreign certificate.
New packages, new technologies, new questions, new regulations…

FOR DPC: The first transport after long storage is not considered in the SAR…

How are used the inequations to determine the radiological safety of spent fuel packages (comparison between calculations and measured dose rate data)

New method validated by ASN: Established with content of reference

Validity of inequations for other contents (higher burn-up) to be justified
Need for shared information between MS

- Lack of information on:
  - other pending applications for certificates
  - issued certificates and further modifications of certificates
  - the packaging itself
  - the intended/actual use of packages (countries, purpose...)

- Difficulties in getting answers on technical aspects
  - Intervention of commercial intermediaries
  - Variable response times

Increasing harmonization in reviewing the original approval

- Submission contents
  - Description of the package, safety assessment, instructions for use, feedback...
  - Translation (original certificate translated by a sworn translator)

- Performing the regulatory review
  - All points must be examined (and not only criticality for package)
  - Depth of the review
Radioprotection
Reduced criteria which should lead to a review of the dosimetric transport limits (dose limits in contact with the package and near the vehicle; release of activities in case of accident, etc...)

![Diagram showing dose limits and zones of radiation protection.](image)
Our email address

dts-transport@asn.fr

Our website

ASN Report on the state of nuclear safety

In the news
Thanks for your attention