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FRENCH DATABASES FOR PACKAGINGS COMPLYING WITH AN APPROVED PACKAGE DESIGN AND FOR APPROVAL CERTIFICATES OF PACKAGE DESIGN

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ABSTRACT

The transport of radioactive material in France concerns the nuclear fuel cycle, the research, the medical use and inspections in civil industry and real estate. Some of these transports are performed with packages the design of which must be approved by the competent authority.

According to the IAEA Transport Regulations, the competent authority shall be informed of the serial number of each packaging manufactured according to an approved design: type B or type C package or a package containing fissile material or uranium hexafluoride.

In 1999, the IRSN has developed for the French competent authority a comprehensive database (SELENE) where are registered "approved-design" packagings owned by French companies. For each serial number, the recorded data are the type of use, the latest maintenance date, the reference of the approval certificate and other information which are useful for the preparation of inspections. Packagings manufactured according to a design for transportation of 0,1 kg or more of uranium hexafluoride and packagings used to transport radioactive material under special arrangement are also included in this database. The IRSN is in charge of the compilation of the updated data every year.

The number of "approved-design" packagings rose from 5 036 in 1999 to 16 222 in 2006. A part of this rise is due to the increase in the number of the identified owners of gamma radiography apparatuses (which are also type B packages) and also the introduction in the database of the cylinders used for the transport of uranium hexafluoride.

The IRSN has also developed a database of the approval certificates of package design and of the approval certificates of special form material which are issued by the French competent authority. This database (CERTIR) can be used in emergency situation to provide basic information on the relevant package safety functions. Periodic national emergency exercises allowed testing its efficiency.

1. FRENCH DATABASE FOR PACKAGINGS COMPLYING WITH AN APPROVED PACKAGE DESIGN (SELENE)

The transport of radioactive material in France concerns the nuclear fuel cycle, the research, the medical use and non destructive examination in civil industry and real estate. Some of these transports are performed with packages the design of which must be approved by the competent authority.

According to the IAEA Transport Regulations, the competent authority had to be informed of the serial number of each packaging manufactured according to an approved design: type B or type C package or a package containing fissile material or containing more than 0,1 kg uranium hexafluoride.

The Institute for radiation protection and nuclear safety (IRSN) has developed for the French competent authority a comprehensive database where are registered "approved-design" packagings owned by French companies.

1.1 Preliminary step : first version of the SELENE database

The first database developed in 1999 gave the following information:

- name of the company,
- name or identification of approved package
- identification mark of the approved package
- serial number of the packaging
- date of the first use
- date of the last maintenance
- type of use of the packaging during the year (transport, storage, test, etc…).

The report on the data collected for 1999 has given a first overview of the "approved-design" packagings owned by French companies. 5 036 packagings associated to 68 approved package designs were declared by 88 companies. The following remarks have been made:

- The use of the packaging had not always been well defined by the company. For instance, for a packaging in interim storage, the user must specify if the packaging is empty of the radioactive contents or not. Some companies of civil industry use gammagraphs for their own use. Then, it was decided to distinguish "transport and gammagraphy" which means daily transportation from "gammagraphy on site" which means use without transport except for maintenance.

- To avoid that the same serial numbers appear for different companies when packagings are sold by a company to another it was decided to keep only the data of the buyer.

- Some companies have different agencies. For the inspectors of the ASN (French Nuclear Safety Authority), it is useful to know the site where the packaging is managed.

- The data of the packagings were transmitted in different formats and had to be entered by hand in the database, which meant a huge work for the whole compilation. Then, it was needed to develop a format allowing the automatic entering of the data to reduce the time of the compilation.

To improve the database on all these difficulties, a new system, called SELENE, was developed in 2002.

1.2 Last evolution of the SELENE database

Associated components

Since 2003, the main components that may be associated to the packaging have been added into the system. For instance, for the transport of enriched uranium hexafluoride (UF6), several designs of overpack may be associated to the cylinders 30B. The overpack designs presently owned by French companies are UX30, COG-OP-30B, NCI-21-PF1. As for the packagings, all the data and in particular the maintenance date must be declared for the associated components.

Transport on site

In 2004, it was decided to add in the system, the packaging "used for on site transportation". In France the transport of radioactive material moved by road within an establishment is subject to safety regulations that account for the specificities of the establishment. The knowledge of the number of packagings used for on site transportation helps the inspectors of the Safety authority to better focus on the most used package designs.

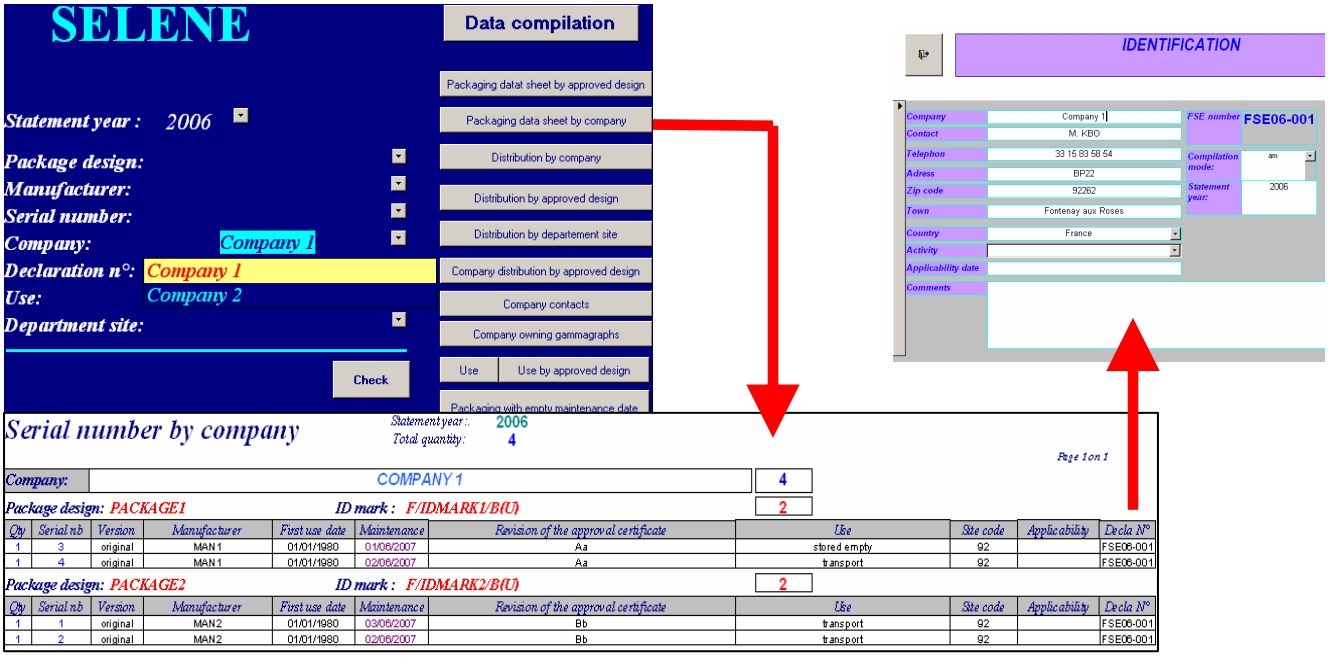
On site transportation	Content category	Certificate issued by
	A/A2 < 100 and non fissile	the director of the site
	A/A2 > 100 or fissile material or UF6 > 0,1 kg	the Competent authority in charge of the site

Listing of the companies

In 2005, the listing of companies was cross-checked and completed by comparison to the listing of another French database used for the registration of radioactive sources owners. This operation resulted in adding about 45 companies owning and using gammagraphs as type B(U) package.

1.3 User interface of the current version of the SELENE database

The user interface allows selecting the list of the packagings by entering some criteria.



For each company, are given: the name of the reference person in the company, address, telephone and type of company (civil industry, medical, nuclear fuel cycle).

For each packaging, are given:

- the packaging commercial name (for instance : GAM 80),
- the package identification mark (for instance : F/137/B(U))
- the revision of the current certificate of approval
- the manufacturer name
- the agency with its post code where the packaging is managed
- the use of the package with a pre-defined list of use :
    - Transport
    - Transport and gammagraphy (the apparatus is frequently carried to be used for inspection in different sites)
    - Gammagraphy on site (the apparatus is only used on the site of the company, there is no transport, expect for maintenance or for changing the radioactive source)
    - Stored empty (the packaging is empty and shall not be used anymore)
    - Definitively stored with contents (the packaging has a radioactive contents and shall not be used anymore)
    - Specimen for qualification test
    - Training use
    - Interim storage, empty
    - Interim storage, loaded
    - Maintenance
    - On site transport

The SELENE database gives several statistic tools:

- the number of packagings by type of use,
- the number of packagings by approved design,
- the listing of companies and contacts,
- a double packagings detection,
- the distribution of the packagings by area,
- the distribution of the use of the packagings by approved design.

1.4 Future improvements of the SELENE database : SELENE

In order to extend the use of the SELENE database, the radiotherapy apparatus which are submitted to maintenance and which are carried in overpacks the design of which are approved by the competent authority as type B(U) packages could also be considered as associated components (like cylinder 30B for UF6).

Around 16 000 packagings are yearly recorded in the database. In order to facilitate the collection and to improve the compilation of the data, a new step of the development of the SELENE database could be a direct on line update.

1.5 Feedback on the application of the SELENE database

The SELENE database was noted as a good practice by the TRANSAS mission in 2003 [1].

"The DGSNR-IRSN register of serial numbers of approved package designs provides a comprehensive and annually updated database for all users and owners of approved package designs in France. It goes beyond the requirements of para. 819 of the 1996 edition of the Transport Regulations by providing more information, and is very useful for the preparation of

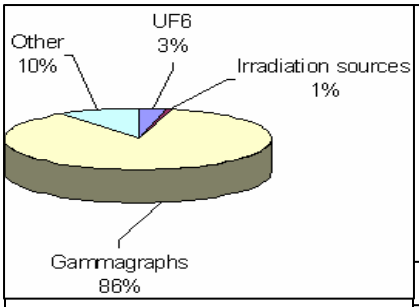
inspections. In this regard the development of a database on package designs not requiring competent authority approval is also considered to be a good practice."

The SELENE database gives useful information for the inspections of companies manufacturing or using or carrying package containing radioactive material. These inspections are performed by the inspectors of the competent authority. Using the database, the inspectors can select the companies which are in their control area or which own packagings from a given design (for instance : the prior theme of the transport inspections of year 2001 was the transport of gammagraphs used as type B(U) package by lots of small companies).
During an inspection, the edition of the list of the packagings for the selected company also allows to check that the maintenance dates of the packagings are consistent with the defined periodicity.

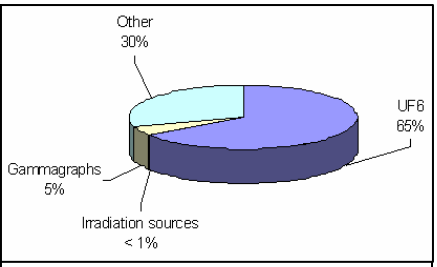
The SELENE database allows knowing how many packagings of a specific package design have been built. This functionality is particularly interesting for the assessment of revised design safety reports to check the impact of any design modification.

About 16 companies (see table 1) manage more than 15 000 packagings in the fuel cycle and research sectors. On the other hand, there is a high number of companies using gammagraphs which manage each an average of 7 gammagraphs. This functionality helps in selecting the companies to be inspected each year.

Table 1 Industry sector for year 2006	Number of companies	Number of packagings
UF6	4	10571
Gammagraphs	105	746
Irradiation sources	1	80
Other (fuel cycle and research)	12	4825
Total	122	16 222



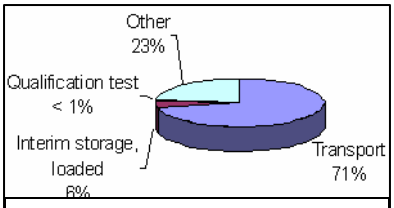
Distribution of companies in the industry sectors



Distribution of packagings in the industry sectors

The database also provides the possibility to display per company the number of packagings declared as "Interim storage, loaded", this helps the inspectors to check whether difficulties may be raised if the packages are to be transported and if no procedure for periodic maintenance in loaded condition is available (see table 2).

Table 2 : Type of use for year 2006	Number of packagings
Transport (gammagraphs transport and on site transport included)	11 551
Interim storage, loaded	897
Specimen for qualification test	14
Other (maintenance, definitively stored, training use, etc…)	3 760
Total	16 222



Type of use of the packagings

2. FRENCH DATABASE FOR APPROVAL CERTIFICATES OF PACKAGE DESIGN (CERTIR)

2.1 User interface

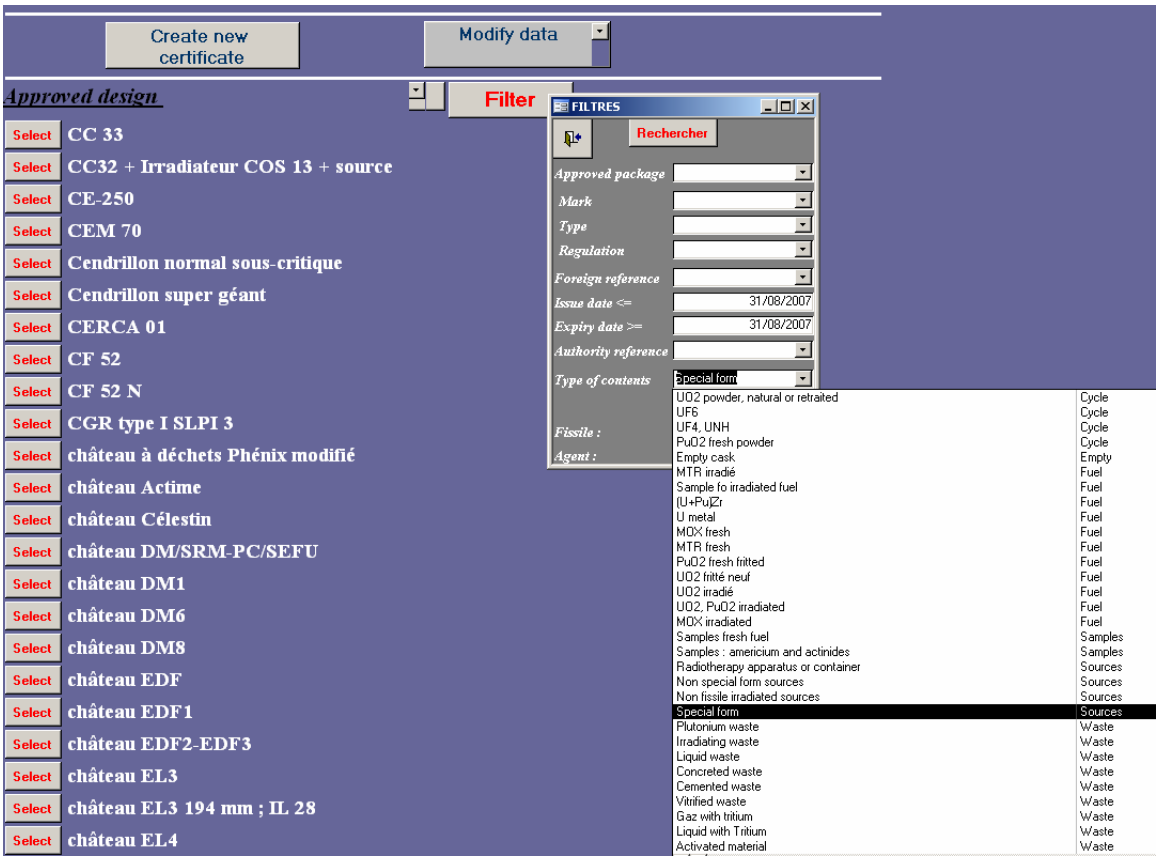
The IRSN has developed the CERTIR database listing the approval certificates issued for package designs and special form radioactive material. All these certificates are scanned. For each certificate, a summary sheet gives synthetic information on the certificate of approval, which is:

- commercial name of the package
- identification mark and revision of the certificate of approval
- reference of the original certificate of approval in the case of validation
- characteristics of the contents (fissile, special form, physical form)
- issue date,
- expiry date,
- name of a contact for further information

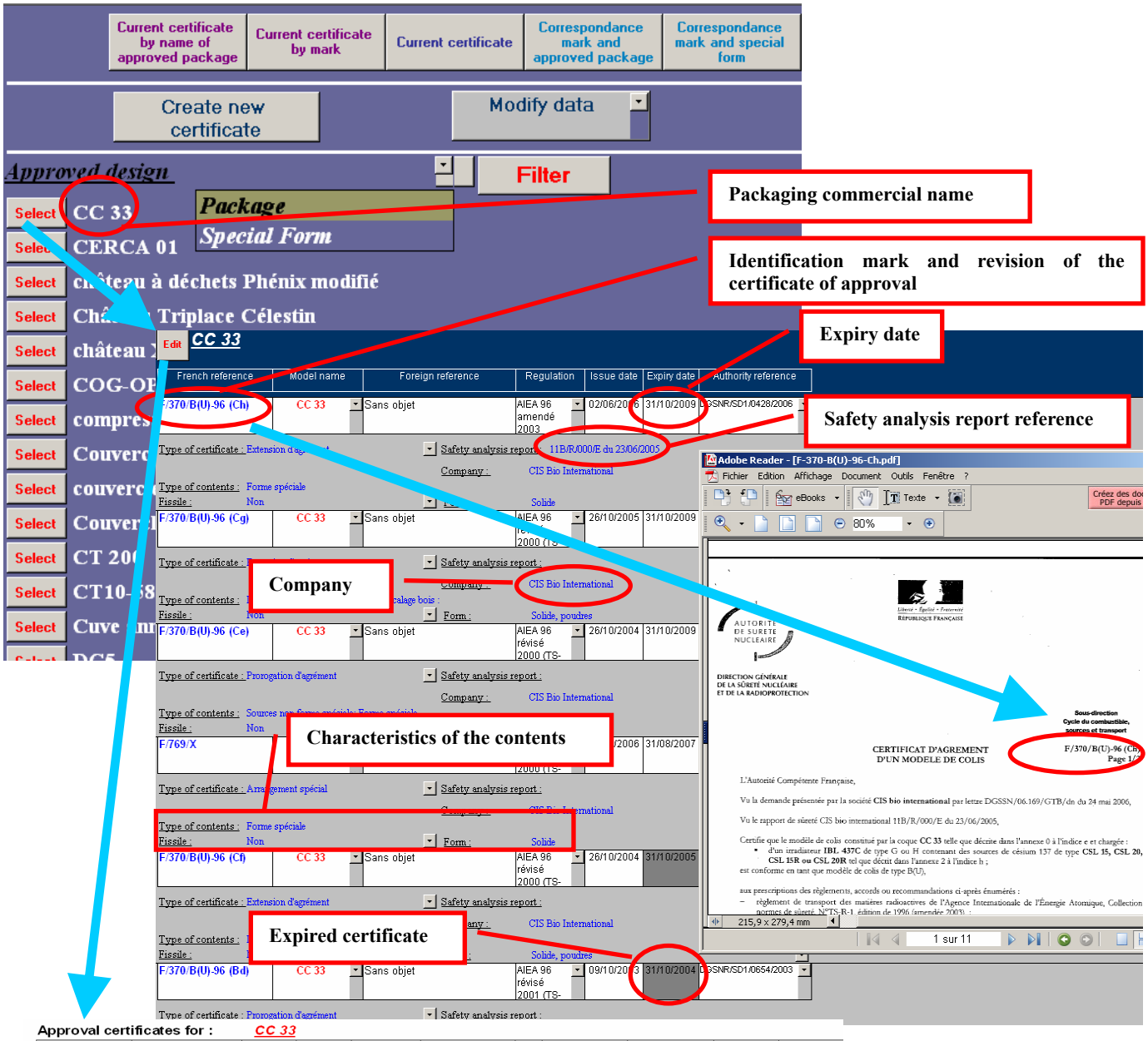
The database allows two different accesses to a certificate:

1. From the "Filter" by entering some criteria :

In the example below, the application Filter selects all the certificates for which the type of contents is material under special form.



2. From the packaging commercial name:



Approval certificates for : CC 33

French reference	Authority reference	Issue date	Expiry date	Type of certif.	Foreign reference	Fissile	Type of contents	Form of contents	IRSN Engineer	Company
F/370/B(U)-96 (Ch)	DGSNR/SD1/0428/2006	02/06/2006	31/10/2009	Extension d'agrément		Non	Forme spéciale	Solide	DGSNR	CIS Bio International
F/370/B(U)-96 (Cg)	DGSNR/SD1/0750/2005	26/10/2005	31/10/2009	Extension d'agrément		Non	Irradiateur / conteneur en coque	Solide, poudres	BEN OUAGHREM	CIS Bio International
F/370/B(U)-96 (Cf)	DGSNR/SD1/0740/2004	26/10/2004	31/10/2005	Extension d'agrément		Non	Irradiateur / conteneur en coque	Solide, poudres	BEN OUAGHREM	CIS Bio International
F/370/B(U)-96 (Ce)	DGSNR/SD1/0739/2004	26/10/2004	31/10/2009	Prorogation d'agrément		Non	Sources non forme spéciale; Forme	Solide, poudres	BEN OUAGHREM	CIS Bio International
F/370/B(U)-96 (Bd)	DGSNR/SD1/0654/2003	09/10/2003	31/10/2004	Prorogation d'agrément		Non	Irradiateur / conteneur en coque	Solide	BEN OUAGHREM	CIS Bio International
F/370/B(U)-96 (Ac)	DGSNR/SD1/0475/2003	11/07/2003	30/09/2003	Extension d'agrément		Non	Irradiateur / conteneur en coque	Solide, poudres	BEN OUAGHREM	CIS Bio International
F/370/B(M)-96 T (Ab)	DGSNR-FAR-SD1-CA-0633/02	26/07/2002	30/09/2003	Extension d'agrément		Non	Sources Irradiantes Sous Forme spéciale	Solide	BEN OUAGHREM	CIS Bio International
F/370/B(U)-85 (Aa)	DSIN-FAR-SD1-CA-089-2000	08/09/2000	30/09/2003	Agrément		Oui	Sources Irradiantes Sous Forme spéciale	Solide	CHALON Frédérick	CIS Bio International
F/769/X	DGSNR/SD1/0782/2006	09/11/2006	31/08/2007	Arrangement spécial		Non	Forme spéciale	Solide	BEN OUAGHREM	CIS Bio International

Summary of the issued certificates of approval for the package design

2.2 Feedback on the application of the CERTIR database

Twice a year, IRSN sends a copy of the database to the competent Authority. Between 80 and 90 approval certificates are yearly issued. The CERTIR database can be used in the following situations:

- List of the certificates issued for a given package design :
  For the assessment of a new safety analysis report concerning a modification of an already approved package design, the CERTIR database gives the summary of the evolutions of the package design.

- Inspection of transport of radioactive material :
  During an inspection relative to the transport of radioactive material, the database allows to check the applicability of the approval certificate, by checking the expiry date and all the operational specifications when defined in the approval certificate.

- Emergency situation :
  In emergency situation, the system immediately provides to the IRSN teams that assess the emergency situation the needed basic information, first from the summary sheet with the type and the characteristics of the contents (fissile, physical form, special form), and directly from the certificate of approval where the main components that assure the relevant package safety functions are indicated. Then, it allows to check the integrity of these safety components.
  Periodic national emergency exercises allow to test the efficiency of the database.

  In 2007, an accident happened during the transport of a package carrying a radioactive source. The package design was not French and the approval certificate was not in the database. The event showed the necessity to effectively get in advance the foreign approval certificates in conformity with the requirement of transport notification and the necessity that these certificates include a description of the components of the package which are the most important for safety (and of special form material) , since the certificates might then be the only information source for the assessment of the safety in case of emergency situation.

CONCLUSIONS

The IRSN has developed two databases used for the management of the safety.
The CERTIR database provides basic information on the relevant package safety functions and the scanned certificates of approval and is an important assessment tool in case of emergency situation.
The SELENE database provides a list of all “approved design” packagings owned by French companies and is useful for the preparation of inspections by the competent authority.
The SELENE database has been noted as a good practice by the TRANSAS mission.

REFERENCES

[1] IAEA Safety Standards Applications – TranSAS-6 Appraisal for France of the Safety of the Transport of Radioactive Material