

**Paper No.3014 Realization of an international emergency exercise
involving a transport of radioactive material**

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Abstract

Transports of radioactive materials are regularly performed in an international context and the possibility of accidents with cross-border consequences cannot be excluded. Therefore, there is a need to harmonize emergency response or at least to have a clear understanding of other countries emergency plans. To that end, it was proposed to consider this topic in the framework of the European project PREPARE and to include various objectives relative to the off-site nuclear emergency response and preparedness in European countries notably in case of transport accident.

The first step of this project was to clearly describe the national and local emergency organization and preparedness in the European countries participating to the project (France, United Kingdom and Belgium) especially in case of accident involving a transport of radioactive material.

The second step of this project was to test, in case of an accident scenario involving an international transport of radioactive material, the emergency plans applied and the communications between two neighboring countries (France and Belgium). A table top exercise was organized to evaluate the accident management process including, on the one hand all phases relative to alerts, reflex actions, information exchange and concerted assessment, on the other hand public information and solution to bring back the transport in a safe status.

This exercise, the first involving an international transport of radioactive materials, took place in the

Emergency Technical Centre of IRSN located in Fontenay-aux-Roses in France. More than 30 people were involved including representatives of the Belgian competent authority (Federal Agency for Nuclear Control – FANC), the French Nuclear Safety Authority (ASN) as well as their Technical Safety Organizations (TSO), respectively BEL V and IRSN, and the major French operator AREVA TN International.

Lessons learned from this experience allowed participants to create a feedback and highlighted the importance of communication between competent authorities and the necessary coordination of local intervention teams.

Introduction

Based on lessons learned from the Fukushima accident, the European PREPARE project includes several Work Packages (WP) with different objectives relative to the “non-nuclear” TRMs emergency planning applied in European countries in case of accident scenarios.

In this context, the main objectives of one of the WPs are to identify the key organizations and entities in the field of nuclear and radiological emergency and post-accident management. One task is dedicated to the transport emergency organization in several European countries. The countries involved in this WP are Belgium, United Kingdom and France.

This WP has three main objectives:

- Description by each country involved of its national emergency organization and preparedness in case of TRM accidents. The description of the local requirements is based on a questionnaire in order to have the same level of information in each country (objective n°1). As part of this objective, members attended transport emergency exercises in France and UK;
- Elaboration of accident exercise to test the information exchange between the competent organizations of two countries involved (Belgium and France) in case of a cross-border TRM accident. A table-top exercise gives the opportunity to evaluate the accident reporting process, information of the public and measures to bring back the transport in a safe status (objective n°2);
- Experience feedback on the emergency response difficulties and proposition of measures to improve communication if necessary (objective n°3).

Description of national emergency organizations

Survey

The 1st objective of this project is to clearly describe and compare the different organizations in place, in case of emergency situations involving transport of radioactive material in the countries involved in this task (France, Belgium and UK).

To obtain common information concerning each emergency organization, IRSN prepared a questionnaire regarding:

- the regulatory documents and relevant provisions (plans, procedures...).
- the responsibilities and functions of each governmental authority having expertise in a specific field (competent authorities, fire brigades, radiation protection teams, medical emergency services...) including information of the public and the international entities.
- the emergency organization of the consignor, the carrier, the consignee and the other transport operators involved in case of a TRM accident.
- the national, provincial/regional and local emergency centers.
- the emergency response during the different phases (initial phase, accident control phase, recovery phase).

Some other topics were addressed, such as communication reporting as well as exercise and training.

These questions were detailed and sent via a questionnaire to all participants.

Description of the emergency organizations

From the answers of the participants, a report was written to present the different organizations in Belgium, in UK and in France. Some comparisons were drawn and conclusions were formulated in order to prepare the second objective of the WP (see next paragraph). From the comparison of the described organizations, different major aspects could be noticed. One of them is the main frame of the organization.

Belgium

In Belgium, the emergency response organization is based on a graded approach essentially driven by the size of the affected territory, the magnitude of health, economic and social consequences and the amounts of requested means to deal with the present and/or foreseeable consequences. This means that serious accidents with only local consequences, limited to a Commune (the smallest administrative entity), are managed by the Mayor assisted by a communal crisis cell unless his own resources are not sufficient to deal with the situation. When more than one Commune are affected or when the resources of the affected communes are too limited to cope with the needs, the Governor takes the lead, assisted by a Provincial crisis cell. Again, when the resources of the Province are insufficient to deal with the situation or when more than one Province is concerned, the federal authorities can be asked to take the leadership over. Because of their potential consequences, radiological and nuclear accidents are emergency situations that are lead at the federal level.

The Belgian nuclear emergency plan [1] involves many response organizations (actors) at federal

level: ministries (Home Affairs, Public Health, Employment and Labour, Agriculture, Foreign Affairs, Finance, Defence and Economic Affairs and Energy), federal agencies (Federal Agency for Nuclear Control - FANC and its subsidiary Bel V, Federal Agency for the Safety of the Food Chain - FASFC), and other counterparts including the licensee of the concerned nuclear facility, the Royal Meteorological Institute (IRM), the Belgian Nuclear Research Centre (SCK•CEN), the National Institute of Radioelements (IRE), authorized inspection bodies, the Belgian Red Cross and other experts (from universities...). Regions and Communities might also be involved in the decision process, together with the federal institutions, according to the extent of their competence in different fields (e.g. environment, education...).

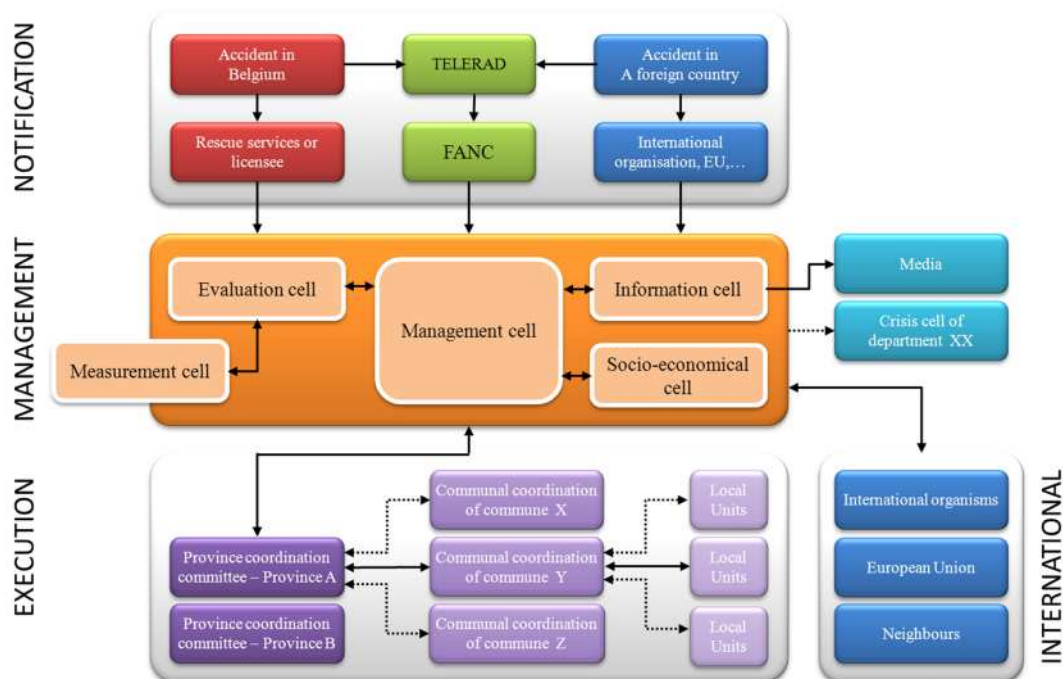


Figure 1: Belgian national emergency organization

The aforementioned actors take part in strategic decisions. Depending on their field of competency and expertise, they are distributed within groups respectively in charge of the measurements¹, the evaluation of the radiological and socio-economic consequences, the decision on protective actions and the information of the public. These groups are hosted by the Governmental Crisis Centre (CGCCR) located in Brussels.

The local authorities (Provinces and Communes) represent the operational level in charge of the

¹ Compared with the general management structure of emergencies to be managed at federal level (EIP nat.; RD 31/01/2003), the measurement group is a specific structure within the NEP which is not present in the management structure for conventional emergencies.

coordination of the implementation by the first responders (fire brigades, civil protection, police...) of the protective action decided by the decision makers at the federal level. Each of these levels must have a general EP&R plan² for its territory and particular EP&R plans for specific risks identified in their jurisdiction.

United Kingdom

In the UK, the responsibility for providing expert support to the emergency services lies with the operators involved. The role of the competent authority (ONR) during an emergency is limited to monitoring the response to an incident, keeping the appropriate ministers and press office informed and providing advice and guidance on the onward transport of any radioactive material. Outside of actual incidents ONR’s regular compliance assurance activities monitor whether organizations involved in TRM are meeting their legal requirements and have appropriate exercise suitable to emergency plans.

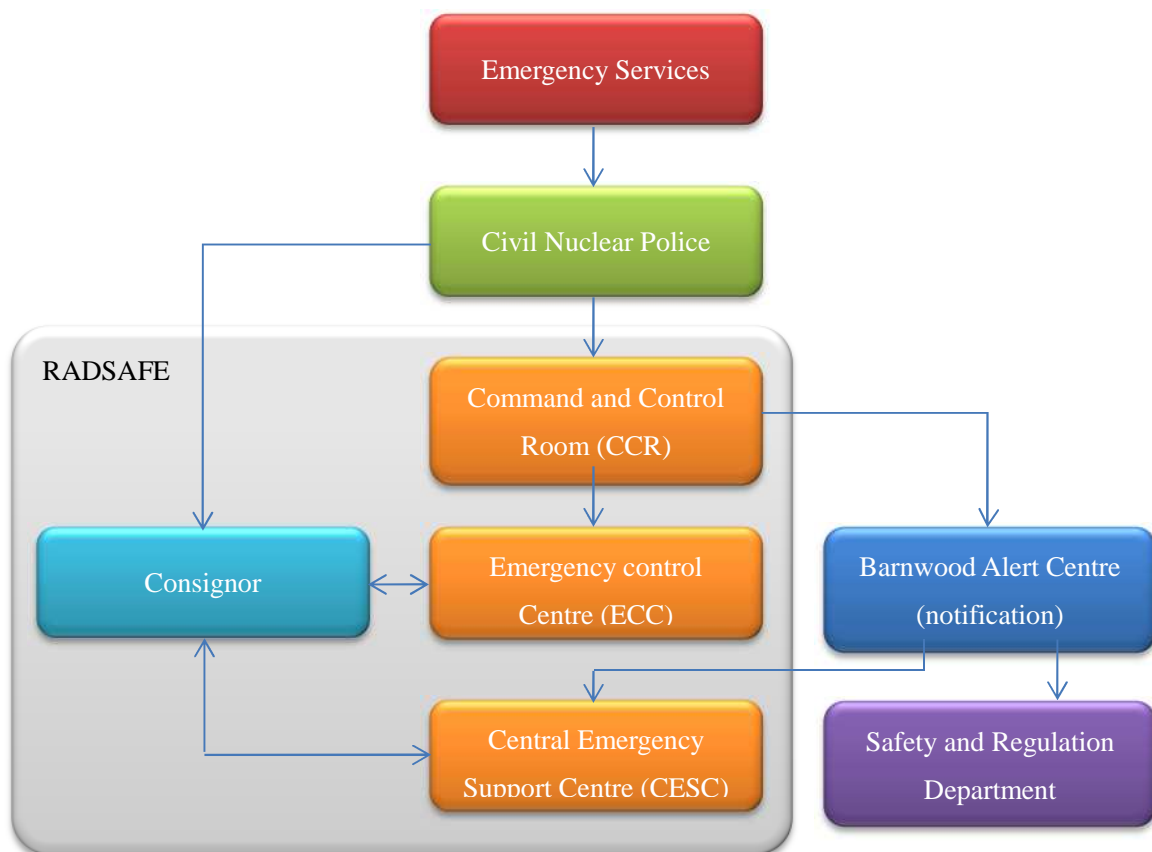


Figure 2: Typical United Kingdom emergency organization (RADSAFE member)

All UK civil nuclear sites and some non-nuclear operators (including the major radiopharmaceutical company) have formed a consortium known as RADSAFE to provide an emergency response. In

² EP&R plan : Emergency Preparedness and Response plan.

case of an accident, the closest RADSAFE member's site will provide support at the scene. The RADSAFE scheme is coordinated by the Civil Nuclear Constabulary who provides a contact point, issue initial advice to the emergency services and activate the appropriate responding site. Responsibility for the recovery phase of an accident lies with the consignor and at some point a handover is made from the RADSAFE responder to consignor.

The UK also has National Arrangements for Incidents involving Radioactivity (NAIR) which is also coordinated by the Civil Nuclear Constabulary and is activated using the same 24/7 emergency telephone number. Potential responders under NAIR are wider than RADSAFE and include hospitals. NAIR is not intended as an alternative to an operator's own arrangements and any transport operator relying on NAIR will be in a breach of the law.

France

In France, for transport of radioactive material for civil use, the management of the accident is under the responsibility of the local prefect with the help of the French competent authority (ASN) after assessment by IRSN and the consignor.

ASN is the “national contact point” for Convention on Early Notification of a Nuclear Accident (IAEA) and for the similar European Union system (ECURIE).

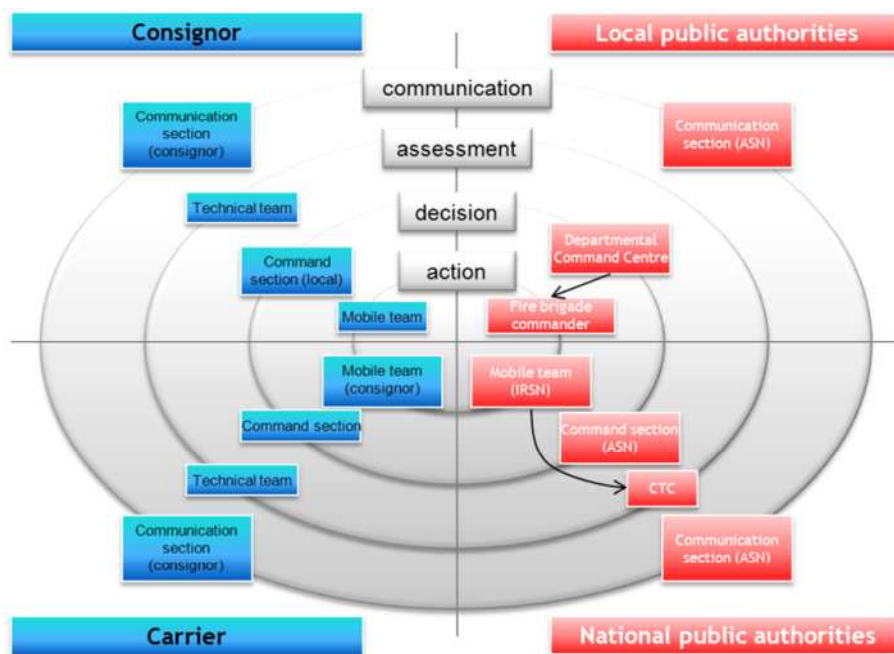


Figure 3: French national emergency organization

Moreover, a number of bi- and multilateral agreements exists with other States for notification,

information exchange, assistance, coordination of the response. This includes:

- Bilateral agreements with neighbouring countries at national and local levels as well as between homologous bodies (regulatory bodies, local authorities, fire brigades...).
- Multilateral agreements (EC, IAEA) and active participation in different working groups aiming at the harmonization of organization (HERCA, WENRA...).

Achievement of the cross border exercise

Preparation of the exercise

The objectives of a table top exercise were defined in order to cope with national specificities. They principally aimed at:

- test the exchange of key information and the communication procedures;
- perform technical evaluation with different tools or means especially to compare the results and the associated actions taken on the accident scene;
- compare competent authorities, technical support organizations and consignor role and actions in an international transport configuration.

A realistic transport configuration between Belgium and France was identified and a credible scenario was developed to take into account the objectives and the limitations.

Scenario of the exercise

The accident involves a shipment of enriched uranium hexafluoride (UF_6) between the FBFC facility located in Romans (South of France) and AREVA NP in Richland (USA). The vehicle used to transport the UX-30 packages was loaded in Romans and on the way to Port of Antwerp (Belgium) to be shipped to the USA. The company in charge of the transport was STSI, a subcontractor of TN International Company.

Just before the border between France and Belgium a gasoline tank truck collided with the vehicle carrying the UX-30 packages. Due to the collision, a severe gasoline leak occurred and 3 UX-30 packages fell on the ground. The impact was immediately followed by a severe fire engulfing the packages.



Figure 4: Accident scene descriptions before the fire

Achievement of the exercise

The exercise took place in the IRSN Emergency Technical Centre (CTC) located in Fontenay-aux-Roses. All the involved entities and their representatives were gathered in this center, but remained physically separated from each other in different rooms; contacts between the representatives of each involved entity were restricted to phone or email only, as would be the case in real emergency situations.

Debriefing of the exercise

A final meeting was organized for the participants to exchange their remarks, lessons learned and conclusions on the exercise. This exercise was the first carried out in Europe involving a transport of radioactive materials with radiological issues affecting more than one country. The following conclusions are formulated and shall be used as further objectives to be reached.

The participants acknowledged the plausibility of such a scenario with a serious cross-border impact, although they considered that the consequences were quite extreme. They also concluded that the initial objectives had been met. Due to a limited attendance (room limitations) compared to the number of experts involved in real situation, the participants felt difficulties in managing the crisis and were overwhelmed by the workload, several tasks having to be fulfilled by a single expert.

Due to organizational constraints a number of entities were not playing. For example, it was noticed that this type of exercise would have led to international consequences including significant diplomatic or territorial components. Everyone agreed that there is a need to develop more common procedures and technical tools exchanges between the stakeholders.

Finally, some national exercises were decided in Belgium and some additional transport exercises could be organized in the future especially to test the interaction on site between the Belgian and French stakeholders. Participants noticed the need to have complementary skills on the consequences of some substances, like the corrosive aspect due to HF releases. Future exercises could involve other countries, for example a consignor in the UK.

Conclusions

International transports of radioactive materials between neighboring or distant countries happen regularly. Therefore the possibility of accidents with cross-border consequences cannot be ruled out. For such events, as for accidents affecting nuclear facilities, it is essential for neighboring countries to have a consistent response. In order to achieve this, there is also a need to harmonize emergency response across borders or at least to have a clear understanding of other countries emergency management organization.

The aforementioned exchange of information on the respective emergency plans has contributed to

improve the common understanding. The exercise allowed the testing of communication procedures on alarming, evaluation of consequences and decisions on protective actions. It also highlighted weaknesses requiring improvements.

This exercise, the first carried out in Europe involving a transport of radioactive materials with consequences in two neighboring countries, was, in this regard, very helpful and is considered by the participants as a starting point to be followed by similar actions, up to full scale exercises, with the objective of developing common management approaches and improving the communication fluxes between neighbors. Future exercises involving other countries should be encouraged.

References

- [1] Royal Decree of 17 October 2003 establishing the nuclear and radiological emergency plan for the Belgian territory, Moniteur belge 20/11/2003: 55874-55940.