

TRANSPORT ACCIDENT EMERGENCY RESPONSE PLAN

M. Vallette-Fontaine(1), P. Frantz (2)

(1) Transnucléaire, 9-11 rue Christophe Colomb, 75008 Paris, France
(2) Reel, Chemin de la Chaux, BP. 39, 69450 Saint Cyr au Mont d'Or, France

SUMMARY

To comply with the IAEA recommendations for the implementation of an Emergency Response Plan as described in Safety Series 87, Transnucléaire, a company deeply involved in the road and rail transports of the fuel cycle, masters means of Emergency Response in the event of a transport accident. This paper aims at analyzing the solutions adopted for the implementation of an Emergency Response Plan and the development of a technical support and adapted means for the recovery of heavy packagings.

INTRODUCTION

Utmost care is exercised in preparation and carrying out of all transports of nuclear materials and a true safety culture governs all actions of specialised personnel. However, a railway or a truck accident cannot be ruled out and this possibility is duly taken into account by the IAEA regulations whose basic principle is that transportation safety relies on the packaging.

All transport packagings are designed to provide a level of protection in proportion with the potential hazard of the various materials transported. While no radioactive release can reasonably be expected from a spent fuel shipping cask, the packagings used for front end materials, because of their less robust nature, could suffer more from a severe transport accident.

An accident involving an extremely strong cask, without any radioactive release, would in itself attract media attention. An accident involving a smaller package, but leading to a slight release of a slightly radioactive product, such as UF₆, would obviously raise a huge reaction of public opinion.

These various reasons prompted Transnucléaire to develop its own comprehensive Emergency Response Plan, including large cask rescue equipment. This paper outlines the main features of the plan and of the various systems required to implement it.

NATIONAL ORGANIZATION

Fuel cycle transports in France

In 1995, 953 transports were performed by Transnucléaire, mainly by rail, and distributed as follows:

Front end	Transports	Back end	Transports
Concentrates	35	Spent fuel assemblies	159
U ₃ O ₈ , UF ₆ , UO ₂ powder, UO ₂ and MOX fresh fuel assemblies	296	Waste	340
		RepU, PuO ₂	123
<i>Total front end</i>	<i>331</i>	<i>Total back end</i>	<i>622</i>

In 1996, more than 1000 transports have been performed, among which an increasing number of spent fuel shipments, with approximately 200 transports scheduled in 1997.

These spent fuel assemblies are transported by rail, from the French and European power plants to the La Hague reprocessing plant, and at the standard freight train speed of 100 km/h.

The other radioactive materials transported by road such as PuO₂ can also be transported from La Hague in the North West of France to be delivered to the Melox MOX manufacturing plant in the South East. Due to these numerous itineraries, most French Prefectures are implied in these transports.

Applicable French Regulations in case of emergency

- Law n° 87-565, dated July 22nd 1987, governing the organization of civil security and risk prevention,
- Decree n° 88-622, dated May 6th 1988, related to the Emergency Response Plan.

According to these regulations, governmental authorities represented by the prefect are in charge of implementing a Response Plan for an accident happening during the transport of radioactive materials.

Prefectures plan in case of emergency

In each department, the prefect has the responsibility of preparing the Emergency Response Plan applicable in case of an accident of radioactive material transport. As head of local administration, the Prefecture can of course draw, as needed, from the resources provided by governmental organizations:

- Firemen, available very quickly in each city,
- Mobile Cells for Radiological Protection (CMIR) present on all French territory,
- ZIPE: first level radiological intervention team,
- ZIDE: second level radiological intervention team.
- CEA (Atomic Energy Commission), and more particularly IPSN (Institute for Protection and Nuclear Safety), deeply involved in the study of the safety analysis reports of the transport packagings,

In addition to these official organizations, the prefect can call up private or industry experts to gather all the technical supports and means available to solve the crisis.

In these conditions, Transnucléaire could be consulted as an expert and the Authorities have been informed about its Emergency Response Plan and the specific means developed for the recovery of a heavy cask after an accident.

TRANSNUCLEAIRE'S EMERGENCY RESPONSE PLAN

For each transport configuration and, according to the radioactive material transported, a specific plan is available on board each transport system to respond to each accident situation. This document specifies 3 categories of measures to be taken after a given type of accident:

Immediate actions to be performed by the drivers or first witnesses to limit as need be the consequences of the accident:

- stop the fire,
- protect the injured people,
- give the alarm and call first aid organizations -local fire brigade and local police forces ("gendarmeries") or mobile cell for radiological protection- and advise Transnucléaire.

First emergency steps to be performed by the first aid organizations with the technical support of Transnucléaire staff to prepare the recovery of the packaging:

- fence off the accident area,
- check for possible radioactivity,
- control the temperature of the packaging and cool it if necessary,
- prevent the spillage of liquid or loose radioactive material.

Second emergency steps to be performed by trained participants to recover the packagings:

- provide access to the cask,
- consolidate the cask position,
- release the cask from its vehicle,
- transfer the cask to the appropriate transportation system,
- clean and restore the area to its original condition.

Adapted means have been set up to allow efficient crisis management:

Technical staff and experts are, in their own field, competent to analyze the situation and to determine the necessary course of action. These experts constitute stand-by teams ready to join rapidly the scene of an accident with the appropriate technical equipment and include:

- specialists in packaging safety analysis,
- participants trained to implement the plan under the guidance of a co-ordinator,
- health physics operators belonging to various COGEMA plants,
- specialists in lifting and hauling operations provided by Reel.

A **crisis room** has been fully equipped to gather technical executives and experts, providing them with the appropriate means to communicate with all relevant organizations several telephone and fax lines, and direct connections with the French Competent Authorities and to co-ordinate the actions of the technical teams. This crisis room, located in Transnucléaire's

head offices, is also dedicated to the satellite tracking of all vehicles, wagons and ships operated by Transnucléaire, which automatically triggers a warning if an anomaly is detected.

Documentation is on hand to assess all the parameters of the accident. It includes descriptions and characteristics of the packagings, transport systems, tie down and ancillary equipment, detailed maps of the transport route, etc.

Dedicated equipment is kept operational to limit the consequences of an accident and to recover the packaging as quickly as possible.

Training: the qualified staff, from which can be drawn stand-by teams is trained to implement the Emergency Response Plan according to their speciality. Practices are repeated each year to incorporate new members in the stand-by teams and to check the skills of the previous participants. These rehearsals also give the opportunity to test the equipment which is submitted to a specific maintenance program during storage.

TRANSNUCLEAIRE'S DEDICATED MEANS

In addition to the relatively standard means implemented in the first emergency steps, Transnucléaire has developed with the expertise of Reel, a company specialized in heavy lifting equipment, the means needed for the second emergency operations. The most spectacular part of this development allows the recovery of heavy spent fuel casks after a road or rail transport accident. The worst situation considered was that of a train derailed along a ravine without any access by road, but only from the track itself.

The following equipment is available:

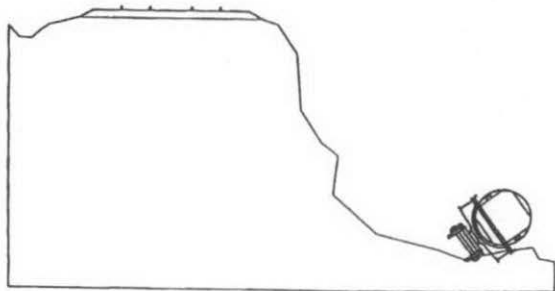
ISO 20 ft containers including devices for protection, access and cask consolidation,
a mobile communication cell allowing to gather the participants, to keep the media informed and to communicate with the staff working in the crisis room,

lifting equipment for the heavy cask composed of:

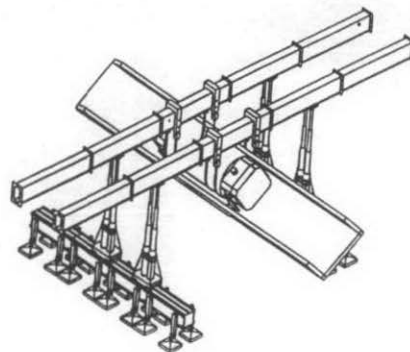
- a large sledge designed to protect and haul the cask, including from a ravine,
- a winch to pull the cask onto the sledge, from the railway or the road,
- a telescopic and modular gantry crane fitted with an adaptable handling beam, tested to a 180 tonne capacity.

CONCLUSION

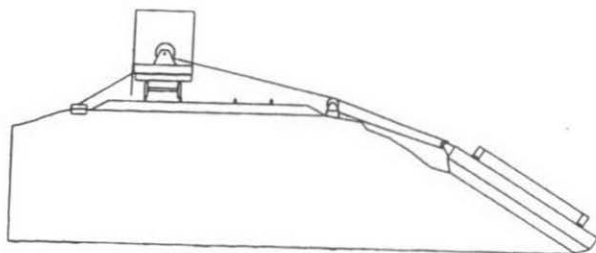
In association with Reel, a company specialized in the field of heavy lifting equipment, Transnucléaire has developed a comprehensive range of material and operational means which can be integrated together with its own staff into the existing national emergency response plans for the event of a Radioactive Material transport accident.



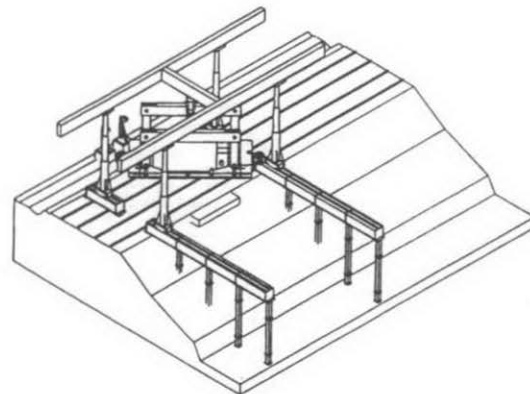
1 - Drop of the cask/wagon in a ravine



2 - Use of a mobile gantry crane to separate cask from wagon, then place cask into sledge



3 - Sledge is hauled to the level of the tracks



4 - Gantry crane is reassembled above the track to place back the cask on a new wagon

Figure 1: Main sequences of cask retrieval after accident

Regulatory Issues

