TRANSPORTS FOR THE FRONT END: A PROFESSIONAL'S TRADE

V. Roland – Vice President Marketing & Sales
Transnucléaire, 9-11, Rue Christophe Colomb, 75008 PARIS

ABSTRACT

Because they involve highly radioactive materials and /or fissile materials, transports for the back end of the fuel cycle have been under scrutiny of the industry, the competent authorities and the general public. Conversely because the considered materials are less felt a sensitive issue, front-end transports are not the focus of the public. However, they do involve packagings that follow the same IAEA recommendations as the back end ones.

Today the transport industry for the front end has to face the challenge of keeping prices low, while complying with new IAEA requirements, overcoming shipping companies reluctance, and developping new packagings.

In the USA, moving the thousands of depleted UF6 cylinders to defluoration is part of the challenge.

Solutions are found by working out long term partnerships, by creative design for low operational cost as shown by the TNU02 and COG 30 B packagings, by constant anticipation and R & D.

INTRODUCTION

Front-end transports are not the focus of the public because the considered materials are not felt a sensitive issue. They involve packagings submitted to suit the same IAEA recommendations (1) as the back end ones. They are mostly of type IP (Industrial Packagings), A or A fissile. Some are type B. Transnucléaire performs yearly approximately 500 transports involving more than ten thousand packagings.

Front end transport also influences waste management, for instance when one must transport defective fuel pellets back to a conversion plant for recycling or depleted uranium hexafluoride for re-enrichment or conversion to metal or oxide.

The practice of the transport industry in the front end is to foster high quality standards. This is reviewed closely by competent authorities, from the design of the packagings to the implementation of transport systems. This bears onto the general expectation from transport systems.

The new ST1 IAEA recommendations affect some packagings of the front end. The level of expectation of transport users and of the authorities is demanding on the industry for the front-end transport. The newly developed COGEMA 30 B overpack is an example of an approach responding to renewed needs, another example is the way the industry contributes to defining the sound day-to-day implementation of the regulations.

Complying with regulations, of course the current approach, is the first step of the practice for the professional transporter. We are ever more expected to anticipate crisis, to go beyond our basic obligations in order to supply a superior level of managing all the steps of the front end transport.

TRANSNUCLEAIRE AND ITS TRANSPORT SYSTEM

Created 37 years ago to carry out transport of radioactive materials, Transnucléaire, a 100% owned COGEMA subsidiary, plays a leading role in this field.

Over the years, its experience has expanded into two complementary areas:

- Design of packagings adapted to each category of nuclear material,
- Services to power plants for cask operation and waste processing.

Transnucléaire's mission is to ensure the movements of all the materials required for the production of nuclear energy.

TRANSNUCLEAIRE is active and creative in all compartments of transport of radioactive materials (from design of new systems through to dismantling of obsolete ones), from the geographical point of view and from the technical point of view.

In addition its front end operations include a permanent team at Pierrelatte, so that logistics and relationship with facilities are as effective as possible.

Lemaréchal and Célestin are the two subsidiaries of Transnucléaire specialized in road transportation and terminals operations. Considering all the different classes of radioactive materials, these two companies have logged 2,056,000 kilometers in 1999.

Geography imposes that Transnucléaire moves radioactive material by sea.

It does so by being a partner in specialized companies like PNTL, of which COGEMA is a shareholder, by keeping charter parties on INF grade ships and by working with regular shipping lines.

One of the front end current concern is the marked and increased reluctance shown by too many shipping lines to accept radioactive material aboard, mainly because they overestimate the administrative difficulties with port authorities at the harbors where they call en route.

Another key activity is making sure that we are represented where international sea regulations and conventions are being bred, by participating in industry associations like WNTI, Foratom and of course the Uranium Institute.

In the front end, Transnucléaire works at several French harbors, Sètes, Fos, Le Havre, Dunkerque (fig. 1.)

It also uses the port of Cherbourg which is a key component in the transportation system set up for the reprocessing of spent fuel at the COGEMA-La Hague reprocessing plant.

In the USA, TNY (Transnuclear New York) arranges front end transport, licensing, or the domestic market and internationaly.

As required in the international regulations and in order to optimize the investments, packages of nuclear materials have to follow a very strict maintenance program.

Transnucléaire has entrusted MMT, a common subsidiary of COGEMA and Transnucléaire, to perform casks maintenance.

AMEC 3, on of the three maintenance shops, in Marcoule maintains lighter systems and front end equipments.

NEW CHALLENGES FOR THE FRONT-END OF THE NUCLEAR FUEL CYCLE

This market, already facing stringent pressure for competitiveness is now subject to a slow but significant evolution as regards public acceptance and safety matters.

During the last few years, the front-end transportation business, which was not the main focus of regulators has been touched, just as all the other parts of the fuel cycle transport activities, by the questioning and demanding approach of the international competent authorities.

For instance, the 1996 edition of IAEA regulations create the new type H package category for natural UF 6:

The industry has started working groups to put forward implementation approaches for consideration by authorities, but still difficulties are looming such as the possible need of valve protective devices.

Or again traditional transport vectors such as the big liners cargo ships, or the commercial freight trains, are more and more questioning the wisdom, from their standpoint, to keep accepting our commodities aboard.

When considering the thousand of cylinders of depleted UF 6 at Paducah and at Portsmouth, this type H approach raises questions to how to move these cylinders.

For enriched UF 6, some of these issues are now answered to by the COG 30 B overpack a B(U)F packaging (fig. 2. and fig. 3.) for enriched UF 6:

By carefully selecting new fire protecting foams with only trace halogen content, working on user-friendly closure devices, by eliminating any need for valve protecting devices, by keeping the interface with facilities unchanged, this overpack developed for COGEMA combines low maintenance costs, easy operation and affordable procurement price for an extended useful life. It is licensed in Europe and in the USA.

The recently licensed TN UO 2 for UO 2 powder and pellets up to 20% enrichment (fig. 4.)

This new concept reduces the number of transports by around 30 %, for the same amount of uranium oxide. It is designed to IAEA ST 1 requirements: investing in development and integrating operational life constraints does yield benefits in terms of operating costs and long term compliance with evolving regulations. It is licensed in Europe and its validation is underway in the USA.
Rather than reviewing again in detail these technical and public acceptance challenges to which Transnucléaire has risen; we shall rather concentrate on practical consequences for our customers and for the industry.

Given that

- The prices of front end goods are quite low and our customers require and obtain very competitive pricing,
- it is in the industry-at-large best interest to anticipate regulatory change, not only at our trade level but also within larger instances such as the IMO,
- there is a need to develop new equipment that remains compatible with receiving and shipping facilities and their productivity goals,

What really is to be solved is the following issue, how can a company remain competitive:

- If it does not clearly convey to its customers that the radioactive transport trade is a complex, demanding trade that require anticipation,
- if therefore it is not clear to all that this anticipation means well oriented resources for the medium term?

Because it is important to be competitive on reasonably identical terms, the choice is there:

- Does the industry want to take the chance of going on with concern for the short term only, despite the relatively low contribution of transport costs to the overall costs of their segment of activity?
- Or does the industry want to invest what is necessary to conserve a lead on continued and still affordable transport in the front end?

We believe that solutions lay in creating stronger partnerships between operators and transport companies. The partnerships can take several different guises among which:

- Entering into long term contracts on given routes, so as to capitalize the transporter's know-how on dedicated ships while assuring the necessary level of payload:
  - Transnucléaire is taking steps to be able to meet customer needs by chartering ships rather than relying on everyday regular lines, and
  - Transnucléaire is also working so that operations could go on with regular lines on the basis of longer term traffic commitments, by information, education of actors so that the perceived risks are brought back down to reality level,
  - the operators and the utilities will find themselves reaping significant benefits by simply investing ahead of time to secure more consistent approaches
- integrating very early in the contractual process the transport issues, so that no one will be tempted to go the cheap route potentially disruptive for all:
  - What Transnucléaire advocates is the affordable, reliable and secure way that is obtained by the front end operators if they do make the transport issue part of the business they are negotiating with utilities,
  - therefore Transnucléaire is ready to contribute early in that process by committing early to solutions for a given deal, and is already doing so in some instances
- by taking into account the long term benefit of anticipation work to avoid dead ends and open crises in operation:
  - Transnucléaire implements its Transport Quality charter that gives outstanding peace of mind to a would-be consignor of radioactive material: Is it not the fair and right choice that the consignor does contribute to the work underlying the charter implementation of the guaranties?
  - Similarly, we are in a position to locate convoys by satellite real time tracking: it will be immeasurably valuable in case of an accident, either real or media related, hence the additional cost include in our prices is well worth the protection it gives.
- contributing by separate R&D contracts to the development of systems for the new millenium.

Granted the spirit of partnership we advocate, how then not to jeopardize the joint competitiveness of consignor and transport company? Here are some approaches:

- Eliminating redundancies by contracting over to the transport company all the transport organization of a given facility (i.e. outsourcing): Transnucléaire is working on some such schemes with customers whereby the customer not only alleviates its staffing, but also makes sure that its legal responsibilities as consignor are fully dealt with. We believe this is one of the practical ways to achieve the principle set above that transport should be integrated as early as possible in the contractual process between front-end operators and utilities. In fact this allows giving the end-customer very early on the full extent of its costs and commitments.
- Setting the standard for the profession: when there is a modal change (e.g. ship to train) the Transnucléaire Transport Quality Charter guarantees availability of competent personnel to cater to any mishap. This, we know from experience is well worth the expense for continued transport.

Should then not the Industry make this its own standard rather than waiting for a media amplified accident… by some other transporter minimal commitment? Moreover, if the industry does not work on improving its standards, it may then be faced by imposition of difficult standards by others!

- Making sure that new packaging developments are user friendly, have low maintenance and operation costs: the TN UO2, that needs no tool for opening or closure, nor paint touch up, the COG 30 B overpack, that is easy to stack, can be opened without having to clear the overpack closest to it are good example of this kind of benefit.

These approaches show that newer and better do not necessarily mean more expensive, when anticipation and partnership are the name of the game!

CONCLUSION

- Transport matters take a major place inside the front-end cycle and the nuclear industry at large,
- any disruption of material flows would affect the overall industry,
- the designs of packagings and associated equipment must progress,
- the industry (i.e. all the industrialists) must propose to the authorities a reasonable time schedule to update the designs and the packagings, and the industry must be the leader, not the authorities ; the aim is to reach a good level of internationally shared practices.

To quote Mr. Richard MESERVE, chairman of NRC talking to the NEI: "we would certainly be the victims of change, rather than its master, without research".
Solving the apparent contradiction of increased demands in a depressed market can be solved by the professional approach using:

- Dedicated logistic solutions that guaranty control and safety
- involving quite reasonable economics stemming from taking the longer view in setting up partnerships involved as early as possible in the operator-end-customer projects.

Recent examples show that facts are stronger than prejudice. Keeping in mind that the uranium market is struggling to remain competitive, one should also understand that there is a time for looking at the bottom line, but there is also a time for investing and preparing tomorrow's bottom line: This is what Transnucléaire is about!

REFERENCES

1. TS-R-1 (ST1 revised) "Regulations for the Safe Transport of Radioactive Material" - 1996 Edition (revised).
2. ROLAND V., POTELLE F., "Transport for the Front End: a Professional's Trade", Uranium Institute, London (September 2000)

FIGURES

Fig. 1. French Harbors

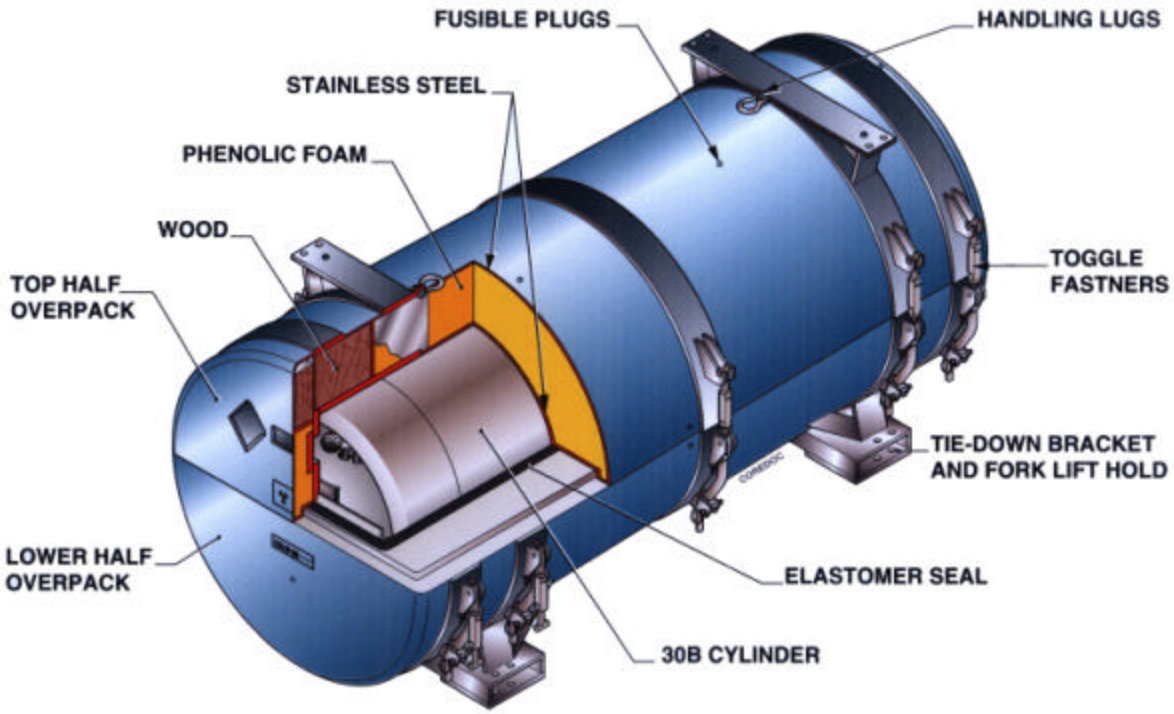

Fig. 2. COG 30B overpack

Fig. 3. COG 30B

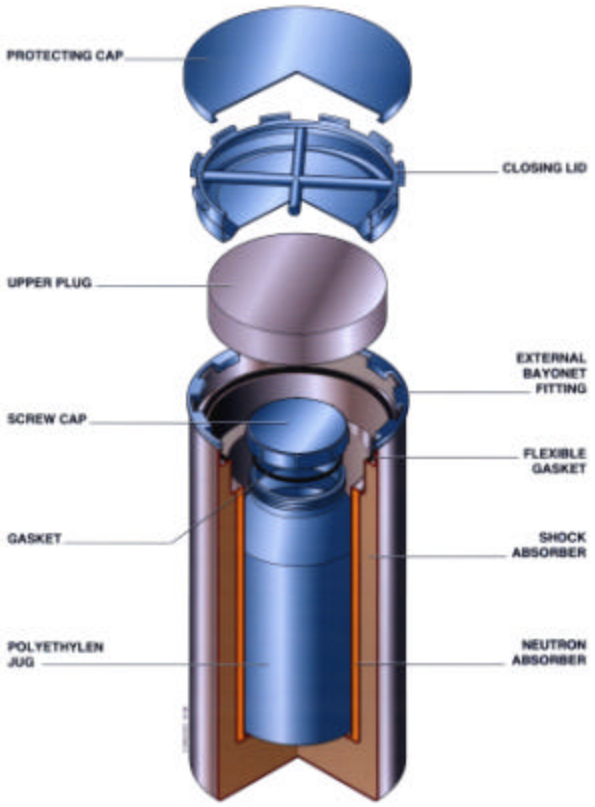

Fig. 4. TN UO_2 packaging