



Reshaping Transport Operations to overcome new challenges

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ABSTRACT

After more than 30 years of Spent Fuel Nuclear Fuel (SFN) and High Level Waste (HLW) casks shipments to and from the COGEMA reprocessing factories in LA HAGUE, COGEMA LOGISTICS has demonstrated a unique outstanding performance in transportation for the benefit of its international customers and has integrated all feed-back from past successful operations.

While maintaining the highest safety and security records, the last 5 years have been a major challenge to overcome the increase in transport throughputs, regulatory requirements, specific customer demands and new environmental approach (both COGEMA-La Hague and COGEMA LOGISTICS have been certified ISO14001 since 2003).

Improvements in procedures, equipments, controls, inspection and organization have been undertaken. Additional important logistics means such as cranes, lifting devices, spreaders were put in operations in the dedicated workshop of our road and maritime facilities as well as in our rail terminals.

Thus COGEMA LOGISTICS has developed and improved important logistics means in the Cherbourg area for the loading and unloading operations of heavy casks (i.e. whose weight is between 25 and 120 tons) among three modes of freight (road, railway or maritime transportation). In Valognes, which is currently the most important railway terminal in the world for the transfer of nuclear materials, about 1200 transfers of heavy casks were performed in 2003.

New transport equipment and assets were integrated successfully to answer the new requirements for the best interest of our customers.

This paper will provide information about equipments and management system developed to overcome these challenges.

It seems necessary now to present the detailed data of the logistics issues COGEMA LOGISTICS had to deal with before describing the different means implemented in our rail, road and maritime terminals by Cherbourg in order to solve it.

I - The logistics issues

Each year COGEMA LOGISTICS has to transfer an average number of 1200 heavy flasks in the region of Cherbourg. These transfers correspond to the movements of nuclear materials provided by COGEMA (PuO₂, MOX, reprocessed Uranium in liquid form and vitrified residues) or supplied for the reprocessing plants such as the spent fuel coming from worldwide utilities, research centers or laboratories.

The following table presents the main movements of these materials and an average yearly number of transfers until end 2003.

Type of material	Consignors/ Consignees	Transportation modes	Location of transfer	Weight of casks	Average yearly number of transfers (1)
SPENT FUELS	Utilities from : France (EDF) Germany Switzerland The Netherlands to : COGEMA HAGUE	Railway and Road	COGEMA LOGISTICS Railway Terminal Valognes	100-115 T	540
VITRIFIED RESIDUS	From COGEMA HAGUE to utilities of : GERMANY SWITZERLAND THE NETHERLANDS BELGIUM JAPAN	Railway and Road Road and/or railway and sea transport	COGEMA LOGISTICS rail and road Terminals Valognes COGEMA LOGISTICS rail and road Terminals Valognes and/or maritime terminal of Cherbourg	100-120 T	50
MOX FUELS	From : MELOX Factory by way of COGEMA HAGUE to : Japanese utilities	Road and sea transport	COGEMA LOGISTICS road Terminals Valognes and/or maritime terminal of Cherbourg	100-115 T	8 to 50
RTR Spent fuels	From : Australian laboratory to : COGEMA HAGUE	Sea and road transport	COGEMA LOGISTICS Maritime terminal of Cherbourg	ISO containers 28 T each	10
URANYL NITRATES (liquid form)	From : COGEMA HAGUE to : COGEMA PIERRELATTE	Road and railway	COGEMA LOGISTICS rail and road Terminals Valognes	Dedicated tanks	500

(1) : including empty casks

The rail terminal in Valognes has become the cornerstone of an activity which remains essential for the working of COGEMA own industrial facilities and the satisfaction of a worldwide demand.

This global activity may also be characterized by the following digits :

- ↳ an average number of 5 transfers of heavy casks each day ;
- ↳ among them, more than 70% of casks whose weight is more than 100 tons.

Each spent fuel cask transiting in Valognes, is controlled by the way of more than 150 smear tests. The same kind of controls is performed on railcars, trucks, semi-trailers and ships. These operations come in addition to the Health Physics monitoring provided by the Nuclear Power Plant and COGEMA La Hague.

Moreover, in order to avoid any contamination spreading and to make these controls easier, new substructures have been built and now composed of dedicated workshops and tools storage buildings.

Thus for a better protection of Environment, strict Health Physics procedures have been developed contributing to AREVA Sustainable Development commitments.

II - The Railway Terminal in Valognes

COGEMA LOGISTICS owns in Valognes a railway terminal, which is currently the largest facility in the world for the transfer of radioactive and nuclear materials between road and railway. The terminal has been built and improved for a capacity of 2000 transfers of heavy casks each year.

This facility covers an area of 45 000 m² among which 1500 m² of covered workshops and offices.

The railway terminal is equipped with 7 rail tracks and 14 rail switches allowing the parking of about forty railcars without disturbing the movements necessary to handling operations or Health Physics monitoring

The covered area is composed of offices and 4 workshops, each of them with the capacity to receive one railcar, a suited Health Physics protection and special heaters to dry the vehicles.

Workshop	A	B	C	D
Surface	600 m ²	150 m ²	400 m ²	130 m ²
Dedicated activity	Dose rate and contamination controls of casks, trucks and railcars Transfer of casks between railcars and road trailers	Contamination controls of railcars	Maintenance and preparation of trucks, road trailers and railcars	Contamination controls of road tanks and railcars

Among the main investments for the handling operations appear particularly:

- ↳ 2 gantry cranes with a capacity of 150 tons
- ↳ 1 locomotive dedicated for internal traffic

The local staff is composed of 20 permanent workers under responsibility of LEMARECHAL-CELESTIN, a COGEMA LOGISTICS transport and handling subsidiary: security guards, trucks and locomotive drivers, crane and lifting devices operators, Health Physics controllers.

Before leaving the facility and joining the public railway network, each railcar is controlled by an independent company whose attendants have their own offices in the covered area.

III - The Maritime Terminal in the Port of Cherbourg

This facility is located at the eastern limits of Cherbourg, which allows the road convoys to use suburban routes. The railway is also directly connected with the maritime terminal. Both transport modes (rail or road) can be used.

The facility developed by COGEMA in the 80's is equipped with a gantry crane with 150 tons capacity and dedicated to heavy casks. Because of the very slow movements of the gantry crane dedicated to the transfers of more than 100 tons casks, it is also possible to operate mobile maritime cranes for lighter and faster loading operations.

Two railway tracks are used for the movements under the lifting devices within a protected area, which can be enlarged according to the number of casks to be transferred.

The quay can receive 6 loaded casks of more than 100 tons for a short time storage on their maritime frames or railcars.

In the framework of the transports program, the maritime terminal is not regularly used and the physical protection of the equipment are ensured by special devices protecting the most sensitive parts and banning any access of the gantry crane and also by a permanent remote surveillance.

Conclusion

In order to satisfy the customers' demand, in the framework of international regulations and in consideration for Quality Assurance and the sake of Environment, COGEMA LOGISTICS has implemented a general purpose organization for the loading operations of casks.

This effective system is mainly based upon the most important railway terminal for nuclear materials in the world completed by a versatile device for maritime operations. Its implementation integrates all the commitments resulting from the certifications obtained by COGEMA LOGISTICS according to ISO 9001, 14001 and OHSAS 18001 standards. The whole organisation remains one of the major elements in our integrated system for all modes of transport.

Such tools give COGEMA LOGISTICS a capacity to face any new markets.