

**OPTIMIZING TRANSPORT SECURITY
RISK ANALYSIS / EMERGENCY RESPONSE PREPAREDNESS**

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ABSTRACT

The transport security is very important for AREVA group and the nuclear business in general. Because the transports are on the public field they are more sensitive for the persons and the environment.

In order to optimize the AREVA group transport security and the effective implementation of nuclear safety charters the Business Unit Logistics puts in place in 2006 a specific organization with a reinforced team and some new processes.

The scope is the transportation of nuclear materials and contaminated equipment representing a specific risk to the group (safety, physical protection, industrial and media)

The main BU LOGISTICS assignments are:

- to provide customized services to every BU of the group
- to certify and control external subcontractors chosen with BU's consent
- to supply all support for BU's in the field of:
 - o Transportation preparation and organization
 - o Emergency management
 - o Monitoring of regulations
 - o Technical expertise associated with transportation

This paper will introduce the approach of the risk analysis. The approach is in three steps:

- The transportation flow risk analysis,
- The Implementation priority
- The proposal for corrective actions.

For risks analysis, we evaluate, for each transportation flow, the occurrence or probability of an event during transport and the consequence of any potential event. From this, we get a risk level for each transport flow.

For the implementation priority, based on the risk level already evaluated in step 1, we evaluate and grade the current management of the risk. So, for each transportation flow, we have the risk level and the current level of the risk management.

For the last part we propose correctives actions for priority flows.

INTRODUCTION

The safe transport of radioactive materials has always been a priority concern for AREVA; today, and to meet tomorrow's challenges, working toward transport related risk reduction has become a major enterprise for AREVA which has entrusted its Logistics Business Unit to conduct this effort: AREVA's Transport Securization.

This paper describes in a first paragraph the context which has led the Logistics Business Unit to conduct transport securization. In a second part, the paper outlines the general principals that governed the designing of the organization in place supporting this effort. The last part describes the organization and methodology of the Logistics Business Unit transport securization

CONTEXT

Active in every stage of the fuel cycle, with actual production and manufacturing activities in 41 countries, and with two-third of its sales revenues depending on outside of France activities, the AREVA group manages numerous international streams of class 7 material between its plants as well as to and from other industrial plants worldwide.

Today, over 600 different steams of transports have been identified and are being part of the Logistics Business Unit transport securization perimeter. This number is increasing as nuclear renaissance springs around the globe. Indeed, AREVA faces increased demand for transportation, reaching out to new countries and regulations, involving new routes, new transport means, new actors within the logistical chain, and eventually new types of transport packages.

It is in this context, and to contribute to AREVA's sustainable worldwide growth, that the Logistics Business Unit efforts are being conducted.

GENERAL PRINCIPLES OF THE ORGANIZATION: CREATING A GLOBAL CENTRE OF EXCELLENCE

The predominant element that governed the designing of the organization in place for transport securization relates to human resources and their allocation to specific tasks at specific times. In an emergency situation, the organization shall allow for experts to be mobilized at any time of the day, any day of the year, and to be driven to efficiently work on their field of expertise. For that organization to be effective, it must be tested, feedback must be analyzed, and implemented back in the organization as needed. Simulation and training is therefore essential: training programs and large scale emergency response drills are specifically designed to improve methodology and effectiveness of experts involved in emergency situations. Good communication and harmonization of terminology are key factors of success when decisions are to be made in restricted timeframe.

Initiative was taken to create a dedicated organization implementing a series of actions aimed at reducing risks related to specific transports. Such organization is not only using existing local Logistics Business Unit resources and experience, but also seeking to use the advanced skills present in the nuclear market including AREVA entities worldwide.

The organization as described in the following paragraph structures the existing skills and expertise forming a harmonized global centre of excellence for nuclear logistics supporting safe, reliable, and efficient transportation of nuclear material and extending the actual safety records to face the challenges of nuclear renaissance.

ORGANIZATION AND METHODOLOGY: PREVENTING EMERGENCY SITUATIONS, MANAGING EMERGENCY SITUATIONS

Backed-up by over 30 years experience and comprised of a worldwide staff of over 800 employees fully dedicated to transport and package engineering, the Logistics Business Unit has designed and implemented its own methodology for preventing and managing emergency situations.

Four pillars support such methodology:

- a) Control of Sub-contractors' Chain of Transports
- b) Risk Analysis and Risk Management
- c) Studies and Support
- d) Emergency response

The first three pillars relate to preparedness for preventing any emergency situation, whereas the last one describes the organization in place to perform operational emergency response. All four are complementary and interdependent.

Control of Sub-contractors' Chain of Transports

Sub-contractors' control is achieved by implementing tight surveillance and an inspection program during transport on pre-qualified sub-contractors. Audits for qualification of sub-contractors are conducted by the Logistics Business Unit certified experts operating an active surveillance and backed-up by an inspection program of physical on-site checks at specific stages of the transport chain. Determination of the specific stages to be inspected and the periodicity of inspections are derived from the risk analysis performed for each transport stream. Inspection reports and their follow-ups feed back the risk analysis (described in the next paragraph); the risk analysis updates the inspection program, thus closing the cycle for a live continuous surveillance.

Risk Analysis and Risk Management

The Logistics Business Unit conducts a risk analysis on every AREVA transport stream. Following the risk analysis, proper recommendations are elaborated for reducing such risks.

The risk analysis establishes the probability of occurrence of an event during transport and the impact of such events on AREVA activities. Transport related events can be attributed to impacting safety, security, the media, or industrial streams.

Combining occurrence and impact provides ground for defining the risk level and the priority of action to engage on recommendations for lowering the risk. Recommendations range from technical solutions involving the development of new transport routes, packages, transport means, tie-down systems, modes of transport, but also improved fleet management, logistics, industrial partnership, processes, training, etc..

Studies and Support

The Logistics Business Unit's organization for transport securization provides support and expertise in fields such as:

- Alternative transport routes
- Public acceptance
- Emergency procedures and operations
- Sustainable development in the field of transport
- Large scale logistical studies
- Package licensing strategy
- Package fleet management
- Public acceptance
- Training,
- Tracking systems
- Tie-down systems
- etc.

Emergency Response

One of the principles among those developed by the IAEA for the safe transport of radioactive material is that emergency preparedness enables to reduce the radiological consequences to persons and the environment, in case of accident.

The IAEA Regulations for the Safe Transport of Radioactive Material require that emergency provisions, as established by relevant national organizations, shall be observed to protect persons, property and the environment.

To help public authorities in charge of emergency response to establish adapted emergency plans, the IAEA published a Safety Guide. This Safety Guide was published for the first time in 1988. The current edition was published in 2002 under the reference TS-G-1.2.

In France, the prefect of the department where the accident occurs is responsible for decisions and measures required to ensure the protection of both population and property at risk.

During an accident, the ministers concerned provide the prefect with recommendations and information, in order to help him make the proper decisions.

The nuclear industry and transport companies also have to be prepared to intervene and to support the authorities at their request, depending on their specialities and their capacities.

The Logistics Business Unit emergency response organization is aimed at reducing transport related risks for the AREVA Group as well as at supporting authorities in the fields of packaging, transport means, contamination and irradiation risk evaluation, proximity expertise and evaluation (with its on-site mobile technical team), and communication.

Emergency preparedness is about providing decision makers with timely and reliable information. For that purpose, the organization provides for the joint effort of both the technical team and the communication team. Making the right decision shall be based on a very quick estimation of the potential consequences of the accident. To be able to evaluate such consequences, a good knowledge of the particular transport, accidental conditions, and material being transported is essential (drop, fire, immersion, duration of the accident, area with impact on the population and the environment).

The organization efficiency is measured against its capacity to achieve the objective of returning under safe conditions. At an early stage, scenarii for recovery of the damaged packages are elaborated by the technical team. Confirming the safety of the packages is a prerequisite to finalizing the recovery scenarii.

Data must be checked prior to release and communication. Communication should allow for simple and clear messages utilizing a harmonized terminology which must be established in advance and tested.

To prepare the emergency teams properly and acquire effective emergency plans, the Logistics Business Unit has been actively participating to regular training exercises with various ministerial department, the nuclear industry, members of the public and the media. Feedback from such training exercises is taken into account to improve the emergency procedures.

The table 1 below summarizes the last large scale national drills performed with the Logistics Business Unit.

Table 1 : Crisis exercises performed with the Logistics Business Unit

	2002	2003	2004	2005	2006	2007
Materials transported	Research used fuel	Low level waste	Used fuel and MOX used fuel	Liquid waste	Enriched UF ₆	Alpha technological wastes
Transport means	Road	Road	Rail	Road	Road	Road
Packaging	IU 04	DV 78	TN 12	TN CIEL	30B cylinder	RD26
Transport company	LEMARECHAL CELESTIN (LMC)	LEMARECHAL CELESTIN (LMC)	SNCF	LEMARECHAL CELESTIN (LMC)	LMC	LMC
Shipper	CEA Saclay center	AREVA NC La Hague plant	EDF Chinon NPP	EDF Paluel NPP	EURODIF	MELOX
Consignee	AREVA NC Cadarache	Centraco incineration plant	AREVA NC La Hague	Centraco incineration plant	GNF	LANL
Transport agent (commissioning)	TN International	TN International	TN International	TN International	TN International	TN International
Area	Yonne (Auxerre)	Eure-et-Loire (Chartres)	Indre-et-Loire (Tours)	Val d'Oise (Cergy-Pontoise)	Roanne (Loire)	Montoir (Loire Atlantique)

Feedback from each training exercise or actual emergency situation often relates to improving communication and reactivity. Feedback has been very beneficial and has largely influenced the actual transport securization organization.

CONCLUSION

AREVA has engaged in a major enterprise for transport related risk reduction to sustain its worldwide growth and properly manage increasing transport activities induced by nuclear renaissance.

A dedicated organization was created, tested, and improved, leading to an effective centre of excellence for nuclear logistics supporting safe, reliable and efficient transportation of nuclear material.