



## **TRANSPORT SYSTEMS**

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### **ABSTRACT**

In a multi-business and also multi-entities context, in order to handle mono or multimodal, national or international transports, a strong and integrated information system has to federate these various businesses and entities around common concepts, to share information and to make processes more fluid, such are the main objectives of the project aiming to modernize the "Transport" information system of the AREVA Group.

From transport order recording, up to real-time follow-up of this transport during its execution, through freight forwarding, fleet management (casks and associated equipments, transportation means as trucks, wagons), risk analysis of transportation schemas, preparation of the useful documentation in case of crisis and organization of the truck drivers missions, such is the functional scope of the project.

Among the business stakes linked to this project, we can quote:

- consolidation of the control of radioactive materials transport for the whole AREVA Group (and more generally transports of dangerous goods), in particular by generalizing the transports oversight,
- industrialization of crisis management processes,
- support of AREVA Logistics Business Unit development while contributing to a high level of competitiveness,
- “distribution” of best practices in the field of radioactive materials transports (and more generally transports of dangerous goods) to the whole group.

Considering the international dimension of the project, ergonomics of the software solutions must be particularly looked after: the tool must remain easy to use while being flexible enough to adapt itself to the various scenarios. Furthermore, in case of international transports, actors of various entities can be brought to share centralized, reliable and secured data.

Finally, regarding its transversal nature, this project is also a “business project” by whom actors of various profiles will have to share processes and “business objects” (transportation schemas, transport files, suppliers, casks, etc.).



## **INTRODUCTION**

The Logistics BU has a strong will of:

- ensuring the transport oversight mission of class7 AREVA Group transports,
- becoming the reference in terms of logistics for the Group and for the market.

### **1. CONTEXT AND STAKES**

#### **1.1. The transport oversight mission**

The transport oversight mission is to “Secure the goods and the associated information, from transport preparation to final delivery”. It means securing operating companies as well as the operation of the transport means.

The Logistics BU transport oversight department:

- identifies AREVA Group transports,
- analyzes their risk level,
- rolls-out a crisis management network and provides assistance in case of crisis,
- inspects and audits transport providers,
- recommends improvement actions within AREVA Group.

This mission has to be totally rolled-out through AREVA Group by the end of 2010.

#### **1.2. The transport system project stakes**

The transport system project stakes are the following:

- ensuring the transport oversight mission in an international context (and study the perimeter extension to the dangerous materials and sensible pieces)
- contributing to further improve AREVA Group’s transport efficiency by a better process and associated risks control
- proposing enlarged services outside the group
  - promotion of the transport oversight services to other actors (electric power companies...) supported by a methodology, means and an adapted IT tool,
  - customer follow-up in their processes improvement.



## 2. PRODUCT DESCRIPTION

### 2.1. Functional scope

This transport system covers the overall activities of the transport lifecycle from its planning, to its execution and oversight. It will be composed by the following modules: casks/materials compliance, transport organization, transport execution, casks fleet management and transport oversight (risk analysis, tracking and crisis management).

This transport system is specific to AREVA business, namely a solution really adapted to radioactive transport management. The chosen solution is a best-of-breed, which is a mix of market solution and specific developments to enable to get:

- conventional logistics and transport best-practices (in terms of optimization, cost management),
- functionalities adapted to nuclear context (regulatory compliance, documents management).

#### 2.1.1. The transport oversight module

The objective of the transport oversight module is to share with the AREVA Business Units (BU), involved in the class 7 transports, all the information needed to organize their shipments in compliance with regulations and to act in case of crisis.

The transport oversight module includes the following functionalities:

- entry of all the inputs needed by the transport oversight department to lead the risk analysis, produce the crisis management documentation, bring assistance in case of crisis...This information is transport flows, transport planning, suppliers. This information can be entered through a service portal or through an interface with the current BUs' information systems.
- access to transport risk analysis, crisis management documentation:
  - technical and collect/decontamination reaction sheets giving information on carried casks and materials, needed for AREVA employees in case of crisis, to elaborate action plan to collect the nuclear material and decontaminate the site,
  - emergency reaction sheets defining the actions to be taken (such as security perimeter) by the emergency teams,
  - communication reaction sheets needed by the AREVA direction to communicate with the authorities and other external stakeholders about the crisis.
- access to qualified suppliers (carriers, freight forwarders, handlers...),
- feeding an incident database and crisis management feedback to improve their transport organization processes, avoid the previously made mistakes and enable inter-BUs sharing,
- access to up-to-date regulatory evolutions and interpretations,
- sharing the transport oversight department issued recommendations.



### 2.1.2. The transport organization module

The transport organization module enables freight forwarders to organize international multi-modal class 7 shipments. It would particularly enable to:

- constitute the administrative transport file, needed in case of audit,
- plan and follow a check-list (named Transport Quality Plan) of all the required administrative steps to make a transport compliant with national and international regulations,
- produce regulatory documents, such as the notifications to send to the authorities before the departure date: indeed, notifications have to be sent for a used fuel transport at Day-15, Day-7 and Day-3 to the French authorities ASN and EOT. The transport system enables to produce these documents including all the data needed on the nuclear material and on the transport organization (itinerary, driver, truck plate...),
- plan and realize operational actions, such as :
  - precise planned times (departure time, port arrival time...)
  - select a logistic scheme (modes and offloading points) and an itinerary, selecting suppliers
  - transmit information to the “transportability” department (enabling them to qualify the carried nuclear material and check the licenses’ validity),
  - share transport and resources short-term planning with casks fleet managers,
  - transmit information to casks fleet managers to allocate resources,
  - transmit information to the AREVA carrier (if chosen) to enable him to allocate the driver, the truck, plan the mission...

The transport organization module is very specific to nuclear business: radioactive transports organization depends mainly on the carried material and on the crossed countries (which imply different regulations) and the regulatory evolutions. The solution has therefore to be flexible enough for users while remaining structured for quality and IS reasons: functionalities like giving the possibility to a key-user to add a regulatory step or modifying a document enable to answer this with flexibility and follow regulations evolution.

### 2.1.3. The cask fleet management module

The cask fleet management module enables for casks fleet managers to allocate regulatory compliant resources to the transports organized by the freight forwarders. It will particularly enable to:

- manage inventory of casks and associated equipments: indeed, for physical and chemical reasons, casks are associated to internal equipments (for example racks) or external ones (for example, BTP thermal protection),
- follow maintenance meters: indeed, each equipment has to be maintained regularly (either cyclically or periodically),
- manage configurations, which are the associations between casks and other equipments (internal or external): for example, associating them for a transport, disassociating them before a maintenance and follow independently the maintenance meters of each equipment,



- manage locations and movements of transports, leasing or internal transfer: it enables to manage the availability of each equipment and allocate it, if possible, to an operation (transport, maintenance, leasing...).

#### 2.1.4. The casks/materials compliance module

The casks/materials compliance module dedicated to the “transportability” department enables to:

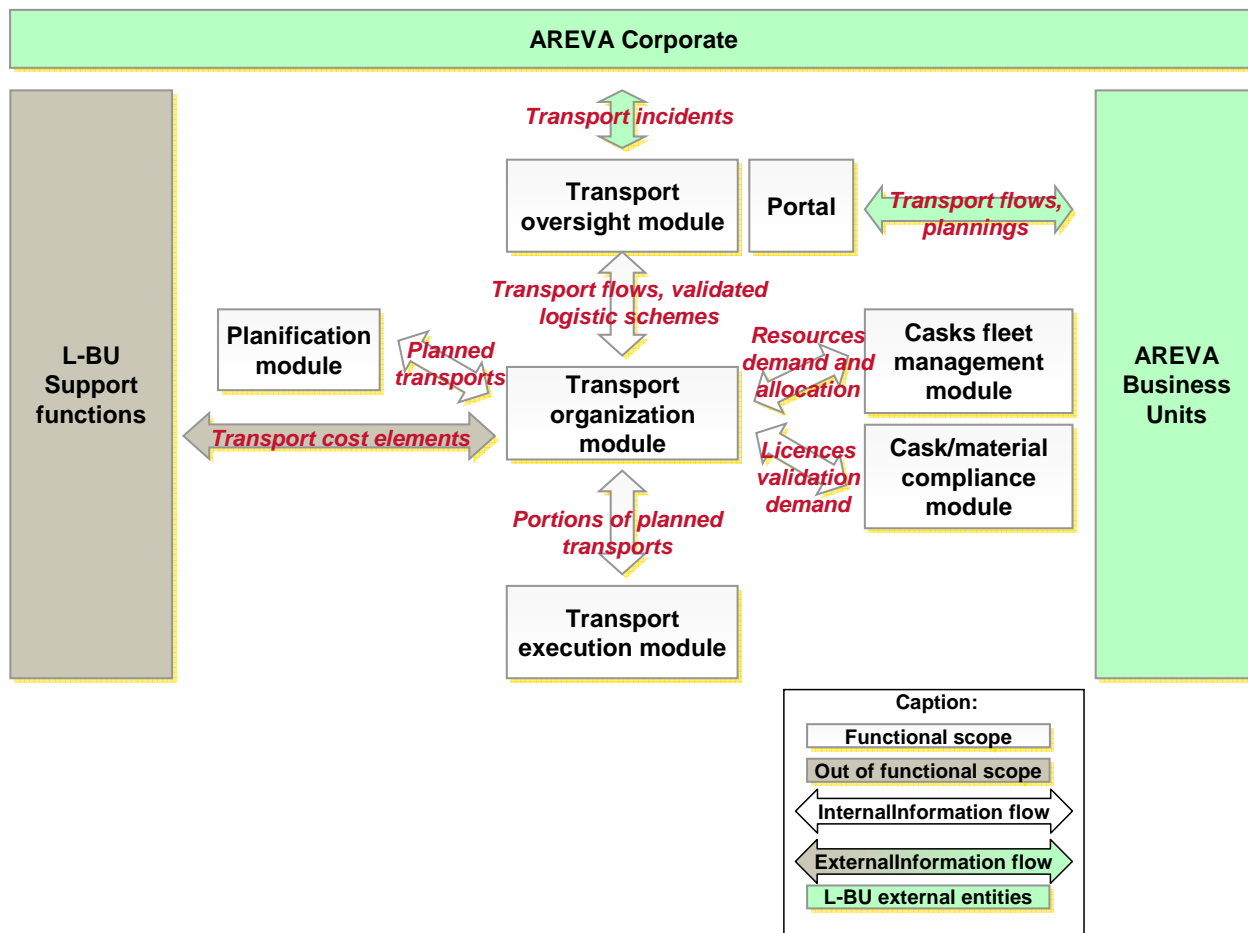
- follow licenses’ validity by country and by cask design,
- check, for a transport, the required licenses’ validity depending on the crossed countries, the content (which is the nuclear material associated to its thermal and radiological properties),
- select the right configuration model to communicate to the cask fleet manager.

#### 2.1.5. The transport execution module

The transport execution module targets carriers. It enables to:

- manage transport missions,
- manage drivers (social data such as driving time, vacations, trainings, habilitations...) and allocate them to missions,
- manage trucks fleet and allocate them to missions.

## 2.2. Modules integration



**Figure 1. Modules integration and information flows**

The transport system modules will be integrated enabling to:

- avoid double-entry by users,
- exchange necessary information between users,
- get all the transport related information in case of crisis.

Thanks to this integration, for a transport organized through the system, the information of the executed transport will be linked to its risk analysis and crisis management documents. Therefore, in case of crisis, the transport oversight department and the concerned BU will be able to find all the documentation needed: crisis management, risk analysis and all the transport execution documents (organizational and administrative).



### **2.3. Ergonomics and flexibility**

The system is:

- flexible to adapt to various scenarios,
- ergonomic to be easy-to-use and enabling users to focus on making their transports regulatory compliant.

In a transport organization, many actors are concerned (shipper, consignee, freight forwarder...) and have defined tasks: the definition of these actors and their associated tasks is easy and the system enables to share centralized, reliable and secured data between them. Therefore, as this system is easy to adapt to each actor's context, it is a key to reach one of the project stakes: rolling-out common transport macro-processes within the group.

## **3. EXPECTED GAINS**

### **3.1. Transport oversight module gains**

This transport system roll-out is a critical contributor to transport oversight mission success. Currently, transmission's way of transport planning, flows and providers from AREVA entities to Logistics BU does not enable to have frequently updated information for transport oversight department, impacting effectiveness on crisis management and risk analysis.

In particular, the transport system presents the following gains:

- time reduction and reliability in information collecting between transport oversight department and AREVA entities (for transport planning and flows),
- effectiveness in crisis management thanks to a homogeneous transport planning format within AREVA entities enabling a better information treatment,
- better information sharing on risk analysis, crisis management with AREVA entities,
- better accessibility to transport documentation in case of crisis: risk analysis (level of risk),
- information exchange with authorities and clients.

### **3.2. Operational gains**

The transport system expected operational gains are the following:

- improving performance of processes involved in regulation compliance through:
  - robustness of administrative and operational documents issuing,
  - access to regulation evolutions.
- optimizing transport costs (casks risk pooling, transport combination and fleet sizing).



### **3.3. Integration gains**

The transport system expected integration gains are the following:

- improved information communication between operational departments: for example, it will be possible to plan and organize a transport by taking into account all the necessary constraints through the IT system (logistic scheme, cask availability and compliance...),
- time-reduction: transport information will be entered once (when possible). For example, during transport organization, information will be retrieved from transport flows. Moreover, fleet managers will not have to enter all the transport information to allocate resources.

## **CONCLUSIONS**

This transport system is critical for the AREVA Group as it contributes to key transport oversight goals:

- reduce transport incident occurrence,
- improve crisis management.

The transport system will contribute to these goals through information system rationalization measures: transport information centralization (risk analysis, organization and execution, incident feedback and recommendations), common processes and information sharing within the group.

Moreover it is an innovative product as it is a system adapted to the nuclear business context, enabling to manage multi-modal transports with strong regulations' requirements, and enough flexible to adapt to each actor and entity involved in the transport organization. This could have been possible thanks to a solution constituted by specific developments and a standard market solution.

It will enable to consolidate AREVA's position in transport market and potentially support new activities like transport oversight consulting for external clients (as electric power suppliers...).