

MANAGEMENT SYSTEM OF THE LOGISTICS BUSINESS UNIT

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ABSTRACT

For the Logistics Business Unit (BU-L), a high safety level for transportation logistics and storage casks is always an absolute priority. In recent publications of the International Atomic Energy Agency (IAEA), “Management System” replaced the concept of “Quality Assurance Program”. We planned for this change a long time ago by developing integrated management systems; at the same time, we remained strongly oriented towards product quality based on long-standing QA principles.

The BU-L is based in Europe, the United States and Japan; to ensure consistency of approach, a single integrated management system with identical goals was developed based on the ten commitments of the AREVA Way continuous improvement process.

In the past 30 years, the industrial landscape has changed considerably, in every field, including the fields of quality assurance and management.

In this article, we will show how the Logistics Business Unit of AREVA has incorporated these changes by mining the possibilities offered by these new ideas, and by keeping two targets in sight:

- Maintaining and even reinforcing the high level of safety achieved in the nuclear field, and
- Developing an integrated and consistent approach throughout our entities in France, Japan and the United States.

The challenges inherent in this effort are immediately apparent:

- New tools and methods, a process-oriented approach, and a commitment to self-assessment might appear to move away from traditional Quality Assurance approaches. This is not at all the case, as we shall see.
- The cultural differences between countries in which the business unit is based could be an obstacle to the establishment of a standard approach. In reality, these differences are actually an asset and have led to performance improvement.

Before going further, a quick review of the Logistics Business Unit’s organizational structure is useful to an understanding of the challenges we face.

Business Segment

The Logistics Business Unit is one of the main participants in the transportation of radioactive and nuclear materials and in the interim dry storage of used light water reactor fuel offering the following services:

- Multi-modal shipments (road, rail, sea, etc.),
- Dual-purpose transportation and storage casks,
- Technical assistance

Organizational Structure

The business unit is organized to meet the need to ensure an optimum level of safety. In particular, the following report to the Director of the Logistics Business Unit:

- The Transportation Safety and Security Department, which has strong expertise in the safety and security fields and the necessary resources to monitor and inspect these operations on an international level and to manage emergency situations that may arise; and
- The Director of Quality, who defines Quality, Safety and Environmental policy and controls its application,

Subsidiaries reporting to the business unit bring the following operating resources:

- United States: Transnuclear, Inc. and Packaging Technology, Inc.
- France: TN International, Mainco and LMC
- Japan: TN Tokyo

Integrated Management Systems

The integration of management systems has been a top priority. Integration is necessary to ensure that the company's many concerns are addressed without any one of them overriding the ultimate goal of ensuring safety.

TN International (350 people, three locations in France) is certified by French quality assurance organizations AFAQ/AFNOR under the standards ISO 9001, ISO 14001 and ISO 18001.

The management system is completely integrated, meaning that the quality, environmental and occupational safety aspects are broached simultaneously, along with the economic aspects and, more generally, all of the sustainable development aspects. This is true both during multiple operational phases ranging from product design to when a performance improvement plan is developed following an employee opinion survey.

The key factor for integration is a process approach; a leader is put in charge of the performance and continuous improvement of each process, in all its aspects.

A practical example can help to illustrate this integration.

ILLUSTRATION: CASK DESIGN PROCESS

The design of a new cask begins with the development of its functional requirements. This is a key stage during which all of the requirements of the customer, future users and more generally all stakeholders are identified, along with the regulatory requirements.

A number of players from different fields – operations, nuclear safety, customer representatives, quality, the environment and occupational safety – are involved at different phases of the design.

Product performance is analyzed during functional, regulatory compliance, environmental and occupational safety design reviews.

In the end, design validation includes an examination of the product's environmental advances and warranties that concern the health and safety of future users, including:

- Optimization of the use of natural resources,
- Reduction of the number of shipments for an equivalent weight transported,
- Shortening of loading/unloading time,
- Shortening of maintenance time,
- Improved radiological checks, and
- Reduction in the volume of waste generated.

Sample Gains:

Compared with the previous generation FS65 cask, the new MX6 (see figure 1) MOX fuel transportation cask, for the same amount of fuel transported:

- Reduces transportation flows by one third thus helping to reduce greenhouse gas emissions;
- Reduces the volume of waste generated during maintenance (the number of maintenance is divided by 8)
- Cuts the amount of natural resources used in cask construction by 50%.

With regard to radiation exposure, it reduces accumulated dose by 15% for unloading operation. Last but certainly not least, on the safety level, it reduces accelerations in case of accident, and allows the cask to be licensed according to IAEA 96.



Figure 1 : MX6 cask

A Clear Organization with Shared Responsibility

Top management ensures that responsibilities and authorities are defined and communicated to the entire organization.

Three important measures instituted throughout the Logistics Business Unit meet this requirement:

- Deployment of two charters to promote and sustain a corporate culture with which management and all personnel identify:
 - o the Values Charter, and
 - o the Nuclear Safety Charter;
- Clear definition of responsibilities via process approaches rolled out in the entities; and
- Methodical approach to "human factors", which supplements and broadens traditional quality assurance approaches.

Corporate Culture

The Values Charter

AREVA's values are defined in the Values Charter as testimony to the responsibilities the group assumes towards its customers, employees, and shareholders, including the communities of which it is a part, whether they are involved directly or indirectly in our activities:

Customer Satisfaction

Profitability

Responsibility

Integrity

Excellence

Sincerity

Partnership

These values are shared by all personnel as well as by our leading partners and suppliers, who have themselves also formally committed to these same values.

The Nuclear Safety Charter

AREVA's commitments in the field of nuclear safety and radiation protection are spelled out in the Nuclear Safety Charter. This charter requires commitment of all employees in the exercise of their duties, both on a personal level and for the company and all of its stakeholders.

These commitments are based on complete transparency. They draw on a culture of safety that is shared by all personnel and maintained through regular training and management reinforcement. They are implemented in the integrated management systems.

The Nuclear Safety Charter sets forth:

- Organizational principles: clear definition of responsibilities, skills, independent verification, emergency management measures; and
- Action principles: safety reviews, capitalization of lessons learned, risk analysis, employee involvement, proactive radiation protection, transparency and reporting.

A Clear Definition of Responsibilities

The requirement for a clear definition of responsibilities, stated unequivocally in the precepts of Quality Assurance, is met effectively in the process approach introduced in ISO 9001.

The process approach is a key factor in product creation; it secures control of operations and, accompanied by the systematic use of check-lists, it helps ensure compliance with the basics of quality assurance:

- Identification of the necessary prerequisites before undertaking an elementary action;
- Definition of the person in charge of the action (“process owner”) and of his/her interface with others involved;
- Identification of output data and linkage to the next step(s).

Through a set of defined criteria, this systematic approach applies to all of the company’s activities:

- Proposals and contracts;
- Cask design and fabrication processes;
- Design, planning and execution of shipments.

But it also applies to the analysis of risks to personnel safety before any operation is undertaken at an industrial site, or to an eco-efficiency review before choosing a new office building.....

Human Factors Approach

This action plan targets the operational aspects of transportation (see figure 2).



Figure 2: transportation of spent fuel with a LMC (BU-L) truck

The objective is to incorporate human factors into the decision-making process, whether it relates to the handling of incidents or, on a preventive level, to the reorganization of transportation flows

or planning for a difficult operation. The human factors approach is based on the following key principles:

- Developing a corporate culture that fosters discipline and strict compliance with rules and regulations.
- Recognizing that "to err is human".
- Facilitating the upward flow of information to instigate useful preventive actions (to do this, it is important for the company to have a truly participatory management system).
- Providing operator education and training in the basics of the approach.
- Promoting communication via meetings where everyone is encouraged not only to describe the difficulties encountered, but to suggest potential areas for improvement if not solutions.
- Ensuring management's frequent presence in the field for greater dialogue with operating personnel.

As a supplement to other measures already taken in the company, this approach helps identify so-called "residual" risk better and trigger new preventive actions; it provides additional assurance to our customers, our regulatory authorities and all stakeholders, whether employee, shareholder or member of the public.

Applied initially to road transportation in France, it helped increase detection of weaknesses tenfold and helped launch significant corrective actions.

Once again, integration is multiplying the benefits of the approach, with gains coming at several levels:

- Economic: by reducing customer waiting times;
- Environmental: by reducing greenhouse gas emissions, making the drive smoother, and reducing diesel fuel consumption;
- Occupational safety: by improving loading and unloading conditions; and
- Safety: by reducing driver stress, a known source of road hazard.

Monitoring and Surveillance

The measures described above go hand-in-hand with an effective second level of control, which is well known and practiced in the fabrication of transportation and storage casks. This control is exercised through verification of documentation, in-plant surveillances and audits.

For radioactive materials transportation, however, the situation is not as clear. There is still a need for assurance that all transportation activities are carried out with due regard for safety, quality, and protection of the public, the environment and employees, but transportation and logistics are not manufacturing. The driver is alone and fully responsible for safe, on-time transportation. One could take a fatalistic view and say that very few controls on the part of logistics providers are possible and can be done mainly through audits. This view, however, could lead to some inefficiencies.

The methods used by AREVA's Logistics Business Unit to apply best practices to all nuclear materials transportation activities for the AREVA group are described hereafter.

As a general rule, controls are implemented to ensure regulatory compliance and adherence to industry standards and directives on safety and security in the transportation and logistics sector.

The initial effort consists of incorporating these various requirements into a list of requirements for shippers. Then, we provide controls at two levels:

The first level of control relates to the control processes that logistics service providers must implement throughout the transportation chain, from planning to debriefing upon completion of the shipment. These controls may be performed through audits, self-checks using checklists, in-house inspections or independent verifications.

All of these means and methods have long been used for design and manufacturing and can be deployed at any static or non-moving step in the transport process.

The revolution brought about by information technology means that logistics service providers now have the opportunity to implement controls during transportation, which was not possible before. These new tools such as real-time tracking systems and digital tachographs, are now available to industry at a reasonable cost.

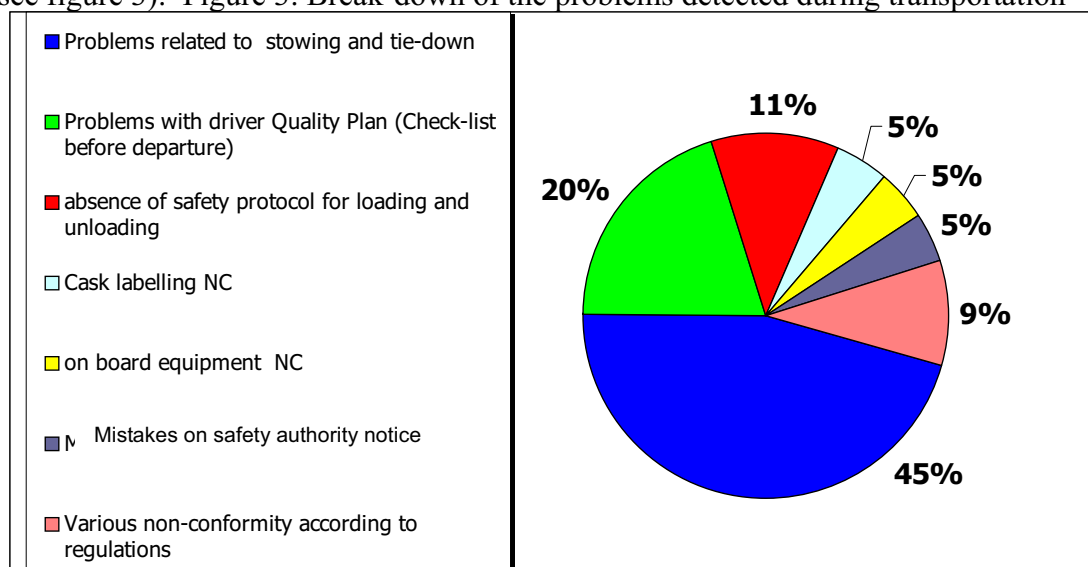
The second level of control involves gaining confidence in the logistics service provider by verifying that it can comply with all requirements and offer sufficient warranties. Confidence should be established prior to awarding any contract and renewed periodically. Audits are the most common way to assess the providers' quality, safety and environmental management systems. Management systems should be reviewed along with key technical points.

These audits provide useful feedback on the provider's strengths and weaknesses in terms of nuclear industry requirements, including its emergency response and assistance plan.

However, this assessment system is not a complete guarantee of the company's safety, quality or value. This is why consignors must have direct control over transportation operations involving major specific risks and should carry out the transportation operation through one of its subsidiaries or a company dedicated to nuclear transportation.

On-the-spot surveillance is conducted by qualified and certified inspectors. A global surveillance plan is set up based on risk analysis. The plan is updated and reissued for each new route, new provider or large increase in shipments. The risk analysis takes into account the dangerous good carried, the mode of transportation, every component of the transportation chain and the number of shipments.

Distribution of problems detected during transportation inspection can be broken down as follows (see figure 3): **Figure 3: Break-down of the problems detected during transportation**



Inspections are performed before departure to the extent possible, but some may be performed on the road or at the consignee's premises. An inspection checklist is used to check key items, based on the operation(s) being inspected. The inspection report describing the inspection and highlighting any findings is issued immediately. Any non-conformance is reported to the service provider and to the consignor so that a solution may be found. The supplier is requested to develop an improvement plan to address the non-conformance(s).

Surveillance in the form of audits and inspections in the field is supplemented by incident reporting for the flows involved.

The applicable BU-L experts meet regularly as committees – specialists in transportation, safety and quality experts – which officially rule on the quality of the AREVA group's transporters.

Here again, integration is viewed in the broadest sense:

- Combination of a more participatory human factors approach and checks in the field;
- All aspects are addressed during checks performed of subcontractors: nuclear safety, regulatory compliance, occupational safety, radiation protection and the right-to-work environment.

More generally, all suppliers are asked to commit contractually to the group's Sustainable Development Statement, which covers all of these aspects.

Continuous Improvement

The AREVA Way initiative is based on the group's management criteria. It incorporates all of the values of sustainable development and continuous improvement and includes 10 commitments (see figure 4) and 100 criteria covering every facet of company operations. Its purpose is to achieve overall performance that is balanced on the three pillars of profitability, environmental protection and social responsibility. All of the Logistics Business Unit's entities implement the AREVA Way initiative.

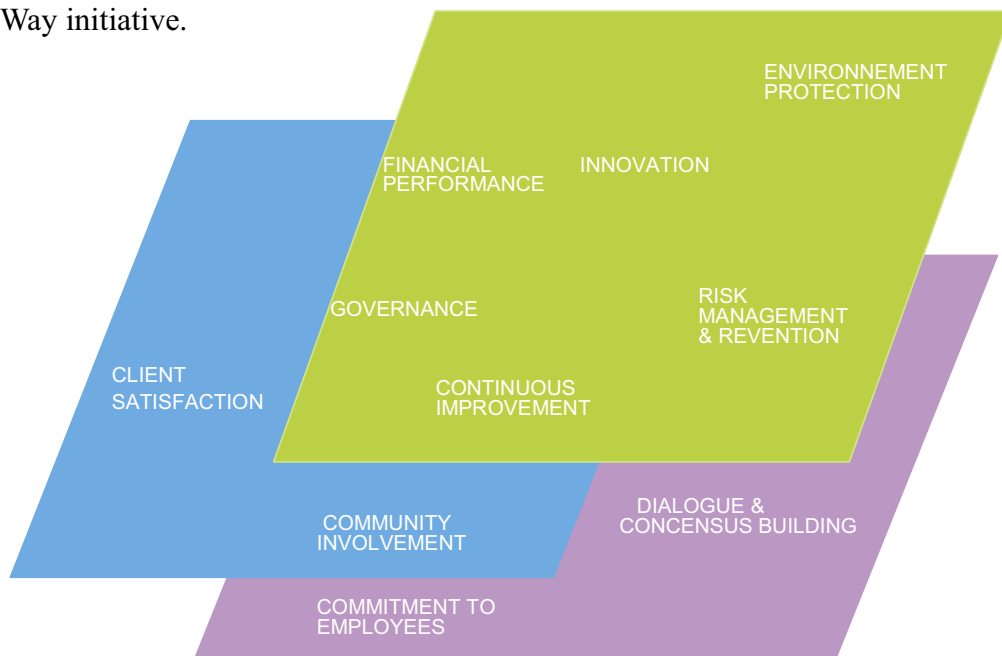


Figure 4: the 10 commitments of AREVA

Once a year, each entity performs a self-assessment in relation to the 100 criteria. An action plan is developed to improve business processes, safety, employee involvement and other areas.

This process is an important factor for integration. Everyone in the business unit follows it. It is used to characterize all of company's needs for improvement and to arrive at a list of priorities at the management level.

AREVA Way permeates the day-to-day management of the company, as can be seen by the close association of "Performance Objectives Charts" derived from self-assessments and the development of each entity's budget.

Conclusion

The industrial world is changing. So are management methods and models. The concepts of sustainable development have emerged in the business world as well as in civil society.

Enterprises are being challenged by all of their internal and external stakeholders. How they manage their relations with those stakeholders will determine whether they can continue to operate.

The nuclear industry, and specifically Class 7 transportation for us here at Patram, cannot avoid this trend. On the contrary, supporting the change and drawing on the advantages it offers is an undeniable opportunity to improve even more, to the benefit of everyone concerned.

To accomplish this, all aspects must be methodically integrated into a single management system ready for deployment by those responsible for it.

This is the challenge facing us today.