Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials
PATRAM 2013
August 18-23, 2013, San Francisco, CA, USA

Inspection of transport activity within AREVA

Pierre MALESYS / Pascal DE BASTIANI

AREVA
33 Rue La Fayette
75009 Paris
France

pierre.malesys@areva.com / *pascal.de_bastiani@areva.com*

Abstract / Introduction

For AREVA, a world leader in the nuclear industry, operation performance is necessarily tied to the absolute compliance with requirements for safety in all of its operations. These operations are – inter alia – those performed either in facilities for which AREVA is the prime nuclear operator, or services it provides to its customers. Of course, they also encompass transport of dangerous goods, including radioactive material.

In order to achieve the highest level of safety, the organisation includes an Inspector General and his Office, the Inspector General Office, comprising a corps of inspectors, who are specifically assigned to inspections related to nuclear and industrial safety.

These inspections are organized on a multiannual programme including many themes, e.g. radiation protection, criticality, fire hazard, waste management, emergency preparedness and response, or subcontractors control.

From 2012, it was decided to include again the transport of radioactive material in the inspection programme, after a few years when this subject was left aside. More precisely, in 2012, the inspections on transport focused on the ability of the consignor to demonstrate full compliance of the packages which are shipped with the applicable requirements.

The General Inspectorate is the third level of control, beyond the technical control, carried out by the operating staff as close as possible to where the activities are located (“Level 0 control”), and the internal quality and safety control such as independent assessment carried out by internal auditors of the entity or of the site (“Level 1 control”). Whilst some inspections are focused on the actual conformity of the activity, most of them are directed towards the analysis of the processes which are implemented, including those to assure the conformity of activities to their requirements.

The General Inspectorate operates under a strict and well defined process which is presented in detail in the paper.

More than 20 in-depth inspections were carried out by the Inspector General Office, and also by the Transport Risk Management Division of AREVA TN. The paper presents the main results of these inspections, the lessons learned and the follow-up plan. It highlights also that the general lessons drawn from the inspections of facilities are also applicable to the transport of radioactive material.

1. The Inspector General Office

For AREVA, as in the whole nuclear industry, operation performance can only be built on an absolute and permanent compliance with the requirements for safety in all of its operations. These operations are – inter alia – those performed either in facilities for which it is the prime nuclear operators, or in the services it provides to its customers. Of course, they also encompass transport of dangerous goods, including radioactive material.

Beyond the technical control, carried out as close as possible to where the activities are located, each site manager has the duty and resources to verify that the authority he has delegated as regards nuclear safety, radiation protection and occupational safety is duly fulfilled. He ensures that this internal verification, called level 1 control, is independent of the operating personnel to whom authority has been delegated.

A corps of inspectors who are independent of the operating organizations has been established within the AREVA corporate department in charge of Nuclear Safety, Occupational Health and Safety, Environment and Sustainable Development. The goals of the General Inspectorate are threefold:

- to bring insights to the Executive Board on the level of nuclear, industrial and occupational safety in the AREVA Group's entities,

- through a transparent and rigorous process, to evaluate sites' effectiveness regarding
    - risk management, control, and governance processes
    - compliance with regulatory requirements and AREVA directives,

- to improve processes effectiveness by issuing recommendations and following-up their implementation.

The inspectors are named by the Executive Board on the proposal of the vice-president in charge of Nuclear Safety, Occupational Health and Safety, Environment and Sustainable Development and of the General Inspectorate. At the present time, the Inspector General leads a body of seven inspectors.

The inspection program is drawn up annually by the Executive Management on the proposal of the vice-president in charge of Nuclear Safety, Occupational Health and Safety, Environment and Sustainable Development and of the General Inspectorate. The program enables verification of the proper application of the Nuclear Safety Charter, early detection of a potential deterioration in performance, and identification of improvements needed to ensure complete control thereof.

After each inspection, the Inspector General Office issues an inspection report which includes a general conclusion and, if necessary, recommendations and their justification. This report is transmitted by means of a synthesis letter which summarizes the main conclusions of the inspection.

The synthesis letter and the recommendations are sent out for information or for action to the management, including the upper management. The site managers ensure that they are translated into corrective actions that are incorporated into action plans.

For all the recommendations, the inspected entity has to transmit to the Inspector General Office, within two months after receiving the report, an action plan as an answer to the recommendations. The Inspector General Office gives its opinion on the relevance and the comprehensiveness of the action plan so proposed. The deadlines announced by the entity in the action plan which has been approved by the Inspector General Office are taken into account. The actual performance of corrective and / or preventive actions which have been announced is assessed during a subsequent inspection of the entity.

The Inspector General Office assures a general follow-up of the implementation of the issued recommendations and reports it regularly to the Executive Board.

Inspectors have sometimes to request immediate measures, including – if needed – the stopping of the operation or the shutdown of the facility involved, for reasons such as:

- observation of a situation generating a serious and immediate hazard,
- record of a regulatory non-compliance likely to create a serious and immediate hazard or to present a serious risk with stakeholders.

This request is announced to the relevant site manager without delay, for instance during the inspection exit meeting. In addition, the inspectors must immediately report thereon to the executive management of the relevant subsidiary and to the chairman of the AREVA Executive Board.

Every year, the Inspector General Office draws up a report on the status of nuclear safety in the Group’s activities and facilities based, in particular, on the results from the inspection program. This report is presented to the Supervisory Board. It is made available to the public via the AREVA Group’s website and is provided to the employee representation bodies.

The activities of the Inspector General Office are based on a full set of documents, including:

- the AREVA Nuclear Safety Charter,
- the General Inspectorate Charter,
- the General Inspectorate Quality Plan,
- the Inspectors Nomination Notes,
- Technical Notes, for the main inspection subjects.

2. The Inspection Programme

The inspection program is built as a multiannual program. All sites are inspected periodically: the period is site-dependent and is based on the potential safety issues of the site.

The inspection programme includes three types of inspection.

- Thematic inspections – This includes:
    - surveillance of the main risks related with safety functions (radiation protection, criticality safety, containment, dissipation of residual thermal power, fire),
    - results of previous inspections (an inspection may result in the identification of new issues which need to be inspected),
    - analysis of events (either individual events or trends in the weak signal analysis),
    - inspections requested by the management (Executive Board, Operation Committee, Management of the Business Groups and Business Units),
    - inspections required by Safety Authorities (either as a part of the license of the facility or following some events).

  Beyond the main risks related with safety functions, typical themes of inspection are waste management, compliance analysis (safety regulations and AREVA directives), configuration management, management of specific projects, maintenance, management of contractors, occupational safety, and – last but not least – transport of radioactive material (either as a whole or some aspects of the transport: manufacturing of packaging, compliance of packages, preparation of shipment, maintenance of packagings, etc.).

- Responsive inspections – The Inspector General Office - of its own initiative or at the request of upper management - performs responsive inspections. They are initiated in the aftermath of a declared event or of the identification of an abnormal situation. They take place either just after the event, or several weeks later.

  Their goals are :
    - to check the comprehensiveness of the cause analyses (apparent cause analysis and root cause analysis),
    - to check the comprehensiveness and effectiveness (particularly if the inspection takes place several weeks after the event) of the curative, corrective and preventive actions, and
    - to identify the lessons learned by the entity where the event occurred and the lessons to be shared with the other entities of the AREVA Group.

- Follow-up inspections – During these follow-up inspections, the effective implementation of the actions defined by the entity in response to the Inspector General Office recommendations, and which were endorsed by the Inspector General Office, is verified.

An inspection includes a significant work before the inspection per se (review of the documentation provided by the site to be inspected). The on-site inspection lasts, typically, three days.

During the year 2012, the Inspector General Office conducted 43 inspections in 28 of the AREVA Group's entities. Twelve of those inspections concerned sites outside France and five were conducted following events. These inspections gave rise to 170 recommendations, which the inspected entities have translated into action plans. In addition, 16 follow-up inspections were conducted to verify the implementation of these action plans according to the planned procedures and announced schedule.

3. Inspections of the transport activity

3.1 Programme of the inspections for the transport activity

In 2012, the inspections focused on the ability of the consignor to demonstrate full compliance of the packages which are shipped with the applicable requirements. More than 20 in-depth inspections were carried out by the Inspector General Office, and also by the Transport Risk Management (TRM) Division of AREVA TN.

Whilst these in-depth inspections were directed towards the analysis of the processes which are implemented, additional controls were carried out by the TRM Division of AREVA TN to confirm the actual conformity of several packages. These controls were performed at consignors' sites before shipments, and were focused on operations related to package preparation and loading, in order to ensure package compliance.

3.2 Findings of the inspections for the transport activity

The first conclusion of the inspections performed in 2012 was that all of the packages which were inspected complied with the IAEA Regulations for the Safe Transport of Radioactive Material.
However, it appears also that improvements are achievable. Recommendations were issued and action plans have been prepared by the entities which have been inspected.

In addition, the consignors are not all at the same level in the management of the safety of transport of radioactive material. The inspections performed in 2012 allowed to identify good practices, which can be considered as benchmark. Sharing these good practices will allow to raise the overall level of all the entities.

Four generic issues are detailed hereafter (the numerous recommendations which result from the inspections, and which are specific to only one or a few consignors are not reported in this paper). Either they are issues where general improvement is achievable with individual actions by all the consignors. Or, for most of them, they are topics where the level of the consignors is heterogeneous, on the one hand, and which warrant cross-cutting actions to raise the overall level of all the entities, on the basis of the best practices which have been identified, on the other hand.

3.2.1 Safety analysis report and operating documentation

For instance, regarding packages which do not need a package design approval by the competent authority, a safety report demonstrating compliance with the regulatory requirements should nevertheless be prepared. The operating rules that yield from these safety reports should be included in the operating documentation. These reports and the corresponding operating documentation should be updated systematically to formally determine the conformity of the measures taken in relation to the regulations and AREVA's internal directives.

3.2.2 Safety adviser

According to the European regulations for land transport (ADR [European Agreements Concerning the International Carriage of Dangerous Goods by Road] and RID [Regulations concerning the International Carriage of Dangerous Goods by Rail]), "each undertaking, the activities of which include the carriage, or the related packing, loading, filling or unloading, of dangerous goods by road or by rail shall appoint one or more *safety advisers* for the carriage of dangerous goods, responsible for helping to prevent the risks inherent in such activities with regard to persons, property and the environment".

The duties of the safety advisers are defined in the European regulations:

- monitoring compliance with the requirements governing the carriage of dangerous goods,
- advertising his undertaking on the carriage of dangerous goods,
- preparing an annual report to the management of his undertaking, including a synthesis of his proposals to improve safety as the result of his monitoring of procedures and practices, on the one hand, and his analysis of events, mishaps and accidents, on the other hand.

In addition, guidance is given in the French regulations for preparing the annual report.

The safety adviser has a key role in the safe transport of radioactive material, and more generally of dangerous goods, both for compliance of practices with the regulatory requirements and for continuous improvement of safety. In order to perform properly his missions, it is therefore important that the safety adviser has (i) an appropriate position in the organization, and (ii) the necessary resources available.

This topic is considered as an important one by the Inspector General Office. Then, due to the discrepancies which has been observed during the inspections, it warrants the issue of internal instructions to complement what is available in the regulations and in the existing guidance, in order to precise the expectation of the Inspector General Office. These internal instructions should also take profit of the best practices which are implemented in the AREVA Group, on the other hand.

3.2.3 Compliance of packages to be shipped

The Inspector General Office recommends that proof of the compliance of the packages with the applicable requirements be made more readily available in order to allow to perform a level 1 control more quickly and effectively. To this end, an AREVA internal directive was issued in 2011 to give instructions about the "control of the compliance of radioactive material packages to be shipped". This directive covers items such as compliance of the packaging (manufacturing and modifications and / or repairs, maintenance), of the radioactive contents (radioactive contents per se and as loaded in the packaging), of the loading of the radioactive contents in the packaging and of the preparation of the package, and of the stowage of the package on the conveyance.

The inspections performed in 2012 allowed to identify good practices for the implementation of this directive. These good practices were shared during the periodic meeting where all the safety advisers are gathered to exchange information and operational feedback.

3.2.4 Training

Training is another item where discrepancies have been observed during the inspections. Again, in order to align the practices to the best one which has been observed, it has been decided to define more precisely the expectations regarding the implementation of the regulatory requirements about training. In addition, the curricula proposed by the various entities within the AREVA Group will be rationalized, in conjunction with the Corporate Training Department (AREVA University).

3.3 Facilities vs. transport

In his annual report for the year 2011, the Inspector General identified nine fields which deserve close attention as part of a program for the continuous improvement of safety in the AREVA facilities:

- lessons learned,
- quality of internal communications,
- maintaining and refreshing skills,
- management of non-routine situations,
- rigorous attitude and behaviour,
- control of the requirements and increasing weight of "administrative safety",
- maintaining compliance of the equipment with their specifications,
- control of subcontracted services,
- organization and management of projects.

On the basis on the inspections which were performed in 2012, and also on the basis of the day-to-day observations, it is worthwhile assessing how these nine fields are also quite relevant to transport.

Lessons learned – Sharing lessons learned and information on deviations, pooling lessons from all identified deviations throughout the AREVA Group, along with the results of the cause analysis that made them happened, are important to improve as much the safety of the transport of radioactive material as the safety of the operations in the nuclear facilities. Best practices should be included much more in this shared experience. Subcontractors and all the stakeholders should be systematically involved, especially because many organizations are involved in one transport, including the consignor, several carriers, several handling operators, and the consignee.

Quality of internal communications – Ensuring that information is smoothly transferred between teams and organizations working in shifts or in the same facilities at the same time is of prime importance both for facilities and transport. Exchanges of information relate in particular to actual conditions in the facilities and to the preparation of the shipment and specific measures taken or to be taken. More specifically, for transport, this pooling of information concerns the teams involved during shift changes, on the one hand, and the many organizations which may be involved when preparing a shipment: different organizations may own the packaging, maintain the packaging, own the radioactive contents (and have the knowledge of their characteristics), load the radioactive contents in the packaging, prepare the package (assemble the components of the package and close it), assure the radiation protection controls, load the package on the conveyance, place the contracts with the carriers, etc.

Maintaining and refreshing skills – For nuclear faculties and for transport of radioactive material, the field of training is very broad, encompassing actions to ensure complete control of technical operations in all situations. Qualification training requirements and support initiatives for newcomers have to be clearly identified to achieve this. It is important that each manager is capable of grasping the issues under all circumstances and of prioritizing them and assigning the necessary resources to them, with safety uppermost in his mind. Here, too, anticipation is essential. Qualification training has to be well defined.

Management of non-routine situations – Several events occurred in 2011 in nuclear facilities when an activity was carried out in a planned but off-normal configuration, such as manual operation of an automated process, or implementation of a special measure due to an equipment failure. To meet off-normal configuration is also quite common in transport. For both facilities and transport, close attention should be paid to this type of situation, to which special measures should apply, such as pre-job briefings or hold points to verify that suitable prevention measures have been defined and are being implemented.

Rigorous attitude and behaviour – This is an area for constant vigilance. Loss of risk awareness and insufficient control by management could lead to inadequate compliance with prescribed measures and basic quality assurance rules.

Control of the requirements and increasing weight of "administrative safety" – Faced with increasingly stringent regulations, broader requirements in the certificate of approval of the package designs, and a very attentive regulator, continuous vigilance is called for in maintaining the priority assigned to managing "administrative safety" (development of technical reports, post-inspection follow-up letters, answers to commitments, etc.) and in ensuring that safety managers are sufficiently present in the field at all times and in direct contact with the operators. These managers should in particular make sure that administrative safety does not substitute for the ongoing follow-up that they have a duty to provide as concerns the know-how, attitudes and behaviour of each operator. The attention of all must be focused on the most important safety requirements.

Maintaining compliance of the equipment with their specifications – Whether it is a nuclear facility or a packaging to transport radioactive material, compliance of the equipment with the specification is the first guarantee of safety. For packagings, the related verifications are brought during inspections before shipment, preventive maintenance and periodic testing.

Control of subcontracted services – For both nuclear facilities and transport of radioactive material, contractors must be carefully watched, both in terms of developing the technical scope of work and in terms of supplier selection, monitoring and acceptance of the product which is delivered. As already mentioned, one the main characteristics and challenges of the transport of radioactive material is the large number of organization which are involved. It is important to have a good knowledge of the duties of each organization, to the necessary guarantees for complete control of all tasks attached to the transport of radioactive material, without gap, nor overlap.

Organization and management of projects – In the field of the preparation and organization of transport of radioactive material, projects should be the subject of clear and precise rules in terms of responsibilities and the requirement to exchange information, again due to the number of organizations which are involved. For the design of a new packaging, projects should also be the subject of the same rules in terms of responsibilities and the requirement to exchange information, but also to testing and qualification measures, and precise criteria for completion. This is a condition which has to be fulfilled to assure that all the constraints of all the parties (consignors, carriers, handling operators, consignees) are identified and taken into account, on the one hand, and that the packagings will meet the expectations of all the parties, on the other hand.

Conclusion

Inspection of transport activity within AREVA by the Inspector General Office is part of the organization which ensures the top management that the operations are performed in compliance with the regulations. It complements the technical control, carried out as close as possible to where the activities are located, and the internal quality and safety control, such as independent assessment carried out by internal auditors of the entity or of the site.

In addition it allows to identify weaknesses in the activities and to help to remedy to them. It allows also to identify good practices. Following the set of inspections performed in 2012, actions have been agreed to share acknowledged best practices.

Comparing the lessons learned during the inspections within the facilities and the inspections of transport activities, and also their general observations, show that the keys to improve the overall level of safety in the nuclear facilities are also applicable to the transport of radioactive material. There is a synergy between both types of inspections, and cross-cutting lessons can and have to be shared.