SAFETY CULTURE IN TRANSPORT

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SUMMARY

« Safety culture » is a wording that appeared first in 1986, during the evaluation of what happened during the Tchernobyl accident.

Safety culture is defined in the IAEA 75-INSAG-4 document as the characteristics and attitude which, in organizations and in men behaviours, make that questions related to safety of nuclear power plants benefits, in priority, of the attention that they need in function of their importance. The INSAG-4 document identifies three different elements necessary to the development of the safety culture: commitment of the policy makers, commitment of the managers of the industry, and commitment of individuals. This paper gives examples to show how safety culture is existing in the way Transnucléaire performs the activities in the field of Transport of nuclear materials.

INTRODUCTION

The wording « safety culture » appeared in 1986 during the Vienna meeting about the understanding of what happened during the Tchernobyl accident. During this meeting, the international experts had difficulties understanding why the operators strived for hours to continue an experiment that did not went along as expected, ignoring operational instructions and shunting automatic safety devices. One of the experts said that this behaviour showed a total lack of « safety culture » that should have progressively led all the levels involved in the experiment to realize that continuing was an actual risk, and that even if the risk itself could not be assessed at once, the experiment had to be stopped immediately.

Since then, the concept of safety culture applied to the operation of nuclear power plant has been developed. The report 75-INSAG-4, edited by the IAEA International Nuclear Safety Advisory Group, deals with the concept of safety culture applied to organizations and men whose activities are related to the nuclear energy field; this report gives a basis to evaluate on actual examples the level of safety culture achieved and, if necessary, decide of improvements to be made.

This report is here used as a guide to point out how safety culture is existing in the field of the activities of Transnucléaire.

DEFINITION OF SAFETY CULTURE IMPLEMENTATION IN FRANCE

The report 75-INSAG-4 defines safety culture as the characteristics and attitude which, in organizations and in men behaviours, make that questions related to safety of nuclear power plants benefits, in priority, of the attention that they need in function of their importance.

Safety culture takes place in two different fields. One of them is the structure in place inside organizations, which is under the responsibility of the management. The other is the behaviour that men at every level have to adapt to this organization and take profit of it in their work.

Thus, the implementation of a safety culture involves the nuclear energy policy makers, and inside operators companies, not only the managers but also men at every level of the organization.

Although the document 75-INSAG-4 is related to safety of nuclear power plants, every development of this document is applicable to other fields of the fuel cycle activities, and as such to the field of transport of radioactive materials.

As far as the policy makers are concerned, it must be noted here that, in mid 1997, the French Directorate for the Safety of Nuclear Facilities (DSIN), which is the Competent Authority for nuclear facilities, has also been entrusted with the responsibility of the transport of civil nuclear materials. In every important activity, as described in the document 75-INSAG-4, behaviour of men is conditioned by the requirements coming from an upper level. The upperest level from which the safety of nuclear cycle matters is influenced is the government level. In deciding that the DSIN is in charge of all activities of the nuclear fuel cycle, including transport, the French policy makers ensure that the basis of the safety culture is the same, whatever the field of activity or the operator. Thus the source of the behaviour of the industrialist is the same.

THE TRANSPORT INDUSTRY IN FRANCE: THE CASE OF TRANSNUCLEAIRE ITS AND SUBSIDIARIES

The basis of the safety culture is the declaration of the safety policy, declaration that proves to the individuals the involvement of the management in the achievement of operations related to safety. For Transnucléaire, as a subsidiary of COGEMA, the source of the safety policy is the Security Instruction of the COGEMA Group, applicable to the COGEMA company and its subsidiaries (Security, in that definition includes safety).

- **INVOLVEMENT OF THE MANAGEMENT**

The declaration of the safety policy has to be clearly implemented in the structure of the organization. This is the reason why the General Management of Transnucléaire decided to group in the same Division Quality, Safety and Security. Besides the departments in charge of the transport operations and of the package and transport systems design operations, whose everyday activities deal with safety (see examples hereafter), this division is in charge of defining, inspecting and evaluating independently the practices in the field of safety. The goal is to have different analysis and point of view appearing through competent people independent of the normal hierarchical structure. This is a useful way of improving the performance of operating personal without searching for guilt in case of defiency. For Transnucléaire, certified ISO 9001 for the transport as well as the design activities, joining in the same division safety and quality is a way to make sure that improvement of the quality of the activities is made with safety in mind.

In that way, the consistency of the quality policy with the safety policy is ensured.

An other advantage of associating quality and safety is the ability of using the tools existing for quality improvement to improve the safety culture of individuals. The training of people to using the quality system of Transnucléaire makes them immediately report any deviation on a deviation sheet. Then the deviation is analysed to put in light its origin (internal, external), to check if there is or not a non conformance, and to define corrective or preventive action if any is necessary. This approach leads to the improvement of the safety culture of the individuals. It allows men to have a rigorous and wise approach, challenging habits that could become confortable.

As an example, one can mention the specific procedures written for the modification of an existing packaging. The safe evaluation of a package, in case of a new content or in case of change of the safety requirements, may require modifications of the packaging (closing pipes endings, designing new type of plugs...). A step by step analysis as required according to a performing quality system allows a complete adequacy between the status of the packaging to be modified and the procedures and tools used to do so.

- **EXAMPLE OF RESOURCES DEDICATED TO SAFETY**

The 75-INSAG-4 document puts in light the fact that it is necessary to have adequate resources dedicated to safety. Several examples can be given here in case of Transnucléaire and subsidiaries. One of them is the availability of performing tools for design. A specific calculation section is in place. It involves, using specific hardware, qualified calculation software for studies in the field of criticality, thermics, shielding and mechanics. Training of people to the use of the codes as well as to the analysis of the results is performed as necessary to the development of the safety culture.

An other example is the implementation by Transnucléaire of a transport emergency response plan. Safety culture not only helps individuals preventing the occurrence of an accident, but also anticipating the operations necessary to master an emergency situation. The Transnucléaire emergency response plan is based on three major items.

The first one is the organization that can be set up: a 24 hours, 7 days a week on duty manager can, if necessary, have the crisis team put in place. This team consists of managers of Transnucléaire, specialists of safety and of casks design or operations, members of the communication division. Settled in a specifically designed room, this team can rely on the documents (such as safety analysis reports, certificates of approval, operating manuals of packagings...), means of calculations, transport planning capabilities, maintenance and operating knowledge of Transnucléaire and its subsidiaries.

The second item of this transport emergency plan is the availability of specifically designed material. Based on the fact that heavy duty mobile cranes for handling 100 tonnes casks need, even when available, a very long period of time to be put in the right place ready for operating, and moreover that they might not have enough bearing capacity, Transnucléaire has designed specific equipments that can be transported in ISO 20' containers, and put in place directly at the accident site to have a heavy cask hauled and transferred to a new transport vehicle.

The third item of the transport emergency plan is, of course, the training of people. Training is achieved through the performance of exercises. Based on safety culture, a crisis situation can thus be mastered.

- **EXAMPLES OF SAFETY CULTURE FOR THE INDIVIDUALS**

It is necessary to give now specific examples that can illustrate two of the requirements of the safety culture, which are on one hand the definition of the responsibility of each entity and each man in the entity, and on the other hand the need of communication.

Involvement of design and transport teams for operating instructions

The packaging designer is in charge of defining the general operating requirements in order to ensure the safe use of the packaging. These requirements are the basis of the detailed operating instructions.

Because the transport assistance team well knows the equipments and the procedures of the loading/unloading installations, they are the best appropriate group for preparing the detailed operating instructions within the respect to the safety requirements.

By their knowledge of the possible site modifications, they will have them evolve. They will also inform the packaging designer to ensure the operational feedback to be taken into account for the design of packagings.

This clear share of responsibility guarantees the best level of safety from design and operation points of view.

But communication need goes beyond the limits of the entities in charge of on one hand engineering and on the other hand transport operations. Safety culture needs an effective communication also with suppliers in charge of maintenance.

Involvement of consignor and consignee during the design phase of a new packaging

Finally it must be pointed out that a good communication with the consignor and consignee is also necessary. For example, the design of the new transport system for Mox fuel (MX type packaging) includes operating tests with a dummy packaging on site of the consignee, an EDF power plant, and on site of the consignor, the MELOX fuel fabrication plant.

The remarks stated by EDF after these tests aim at ensuring the compatibility between the equipements and checking the adequacy with the site procedures. They also aim at improving the safety of the operations.

These remarks concern among others the working area around the packaging, the clear marking of the mobile masses to be lifted, the optimization of the operating sequence to reduce the dose rates to the operators, the definition of additional protecting devices to simplify the decontamination, the design of the tools to prevent them from falling in the packaging or in the loading pit,...

These remarks will be taken into account in the design phase of the new MOX packaging and associated transport system.

This test made with a dummy packaging was very appreciated to improve the safety and the future exploitation as early as during the initial design phase.

CONCLUSION

Safety culture deals with human factor, which implies on one hand the human error that can generate or increase an incident and on the other hand the human ability to detect and prevent potential problems.

Men perform activities within structures that are conditioning the way they behave. That is the reason why safety culture involves three different levels: the policy makers, the managers of the industry, and individuals.

The example given above demonstrate that the men who perform activities under the responsibility of Transnucléaire in the fields of transport of radioactive material and design of equipments and transport systems are having a strong safety culture.

REFERENCE

Safety Culture - Report of the International Nuclear Safety Advisory Group. Safety Series n°75-INSAG-4, Vienna, 1991, IAEA.