

Ms Véronique Decobert, Senior Vice President for Health, Safety and Security, AREVA Achieving Nuclear Safety Performance: Regulatory Effectiveness from Operator's View Point

Abstract

Sustainable development is a keystone of AREVA's industrial strategy for achieving growth that is profitable, socially responsible and environmentally respectful. As an operator we are committed to establishing and maintaining the highest level of nuclear and occupational safety in all of the group's operations to preserve public and worker health, and to protect the environment. The same is true when we act as vendors of nuclear facilities, whether nuclear power reactors or anything else.

Achieving a high safety record is also a necessary condition for ensuring the economical performance of these facilities and for strengthening the acceptance of nuclear towards local population as well as all decision makers. The existence of a solid international framework and strong and independent national authorities are important elements to support those targets.

From an operator's point of view, regulatory effectiveness is coming through clear and stable rules, designed and applied in a rigorous yet pragmatic way to cater to the specificities of each type of facilities.

- Clear to avoid the uncertainty related to potential diverging interpretations.
- Stability to ensure that solutions developed to meet the regulations and investments made accordingly are useful and derive real value for both safety objective and the industry.

Regulatory effectiveness is also achieved when actual experience and the input of operators can be taken into account to achieve high safety objectives in a most efficient way.

Finally, we must recognize that the nuclear industry is today mature and international. To further support the expected development of nuclear energy in the world, it is in our view important to move towards harmonization of the safety regime and increased cooperation between licensing authorities.

1. The operator has the prime responsibility for nuclear safety and radiation protection

Nuclear safety and radiation protection are sometimes described as constraints coming from the regulator. But from an operator's point of view they are primarily an absolute requirement: it is the cornerstone of the sustainability of its activity. Ensuring stable production and

developing a trustworthy relationship with all stakeholders are prerequisites for achieving growth that is economically sound, socially responsible and environmentally respectful. Obviously, a safety failure would compromise the success of a company, and may damage the whole industry. Indeed, the nuclear community has the strength of the weakest of its members.

AREVA is acting accordingly: the technological risk management is embedded in the commitments of the group towards sustainable development.

While assuring a high level of safety in the facilities operated by AREVA, we are also committed to help achieving a high level of nuclear safety and radiation protection for service activities that we perform at our nuclear customers' sites. Safety is also one of our guiding principles when designing nuclear power plants, the EPR being a good example, or fuel cycle facilities.

This commitment to nuclear safety and radiation protection is publicly taken in the AREVA Nuclear Safety Charter, anchored in organizational and action principles and with complete transparency. The Nuclear Safety Charter standardizes the group practices in the sensitive domains of nuclear safety and radiation protection throughout the life cycle of the facilities, whatever the country: as an example, the objective of reducing the maximum individual dose to workers to 20 mSv/man/year is set even in countries when it is more stringent than regulatory requirements.

2. The regulatory system: what the needs and expectations of the operator are

If nuclear safety and radiation protection are the prime responsibility of the operator, the operator cannot do it alone. Here, regulators have a key role to play. And the nuclear industry needs "strong" regulators.

This industry is one of the most regulated industries in the world, and moreover, it has been regulated from the very beginning. Born on governmental decisions, in many countries the regulation was national. National regulatory systems were set up and implemented before there was any necessity to share international standards. Some years ago, most of the national parties involved in nuclear safety thought that, since individual authorization and control of compliance are local matters, an effective regulatory system can be, sometimes even must be, national only. Obviously, that did not encourage the use of IAEA-developed Safety Standards at the national level.

But the world surrounding us has expanded from a local perimeter to a global perimeter, and it applies also to our industry. Nuclear-related activities are performed in an international environment and are challenged by stakeholders, by the civil society, locally and abroad. Differences in safety approaches, in implementation of safety in each of our facilities can weaken the whole nuclear community, regulators as well as operators, and possibly governments: for example, if a regulator requires a concrete structure for a facility to limit the release in case of explosion, it will be difficult to explain to the stakeholders why another regulator accepted the sister facility without concrete containment, because this regulator considered that the accidental release was not harmful to the public. This would weaken not only the operator but also the regulator ... and the operators need strong regulatory bodies.

We will not attempt to offer a ready-made solution to this striking example.

Instead, let's have a look at the concrete needs of operators from two different situations: one from the facility standpoint, and one from the future operators of an imported technology; and what it means in terms of effectiveness of the regulatory system.

Viewed from the facility, the needs are:

- To obtain timely individual license and authorizations throughout the life cycle of the facility: for initial licensing, in case of modification of the facility, or after periodic safety review of an ageing facility,
- To operate the plant in a manner to ensure successful controls of compliance to regulation.

And thus, we could say that, viewed from a facility, conditions for an effective regulatory system are:

- Dealing with a local regulator, responsible for decisions and controls towards the national government,
- Using clear and stable rules, clear to avoid different interpretations between operator and regulator, and stable to avoid change of rules with huge consequences in terms of cost. Of course, that does not mean that operators are opposed to changes of the rules, it means that, in sustainable development business, they need to integrate changes in their continuous improvement and modification processes.

Viewed as future operator of an imported technology, running in another country, the needs are:

- To minimize and to secure the cost of the investment. The reasons why the design was bought abroad are that, first, it reduces risks on the construction or on the process, since it is running; second, the operating cost is more precisely estimated, since the facility is successfully operated in the other country and expected revenues can be better forecast; and finally, it minimizes the licensing cost since the

facility is already licensed abroad. Thus, this future operator needs consistency between licensing from native country of the design, and importing country licensing. To secure the cost of the investment, it implies also to limit the implementation differences to those justified by siting (seismic, inundation, weather conditions ...);

- To reach safely and on schedule the design capacity, after the facility has been granted the license. This is improved when there is a dialogue between the regulator in charge of the control and the operator, rather than limiting the contacts to only bureaucratic exchanges of paperwork.

And thus, for this future operator, effective regulatory system would mean:

- International consistency between safety evaluations and their findings: consistency of the safety standards, consistency of the methods to evaluate the safety of the design, acceptance of the safety evaluation made elsewhere;
- An efficient dialogue between the designer's country regulator and the licensee's country regulator, so that one can trust the licensing work of the other;
- Good knowledge by the designer of the licensee's regulatory system. And the more the regulatory systems in the two countries are consistent, the easiest this is to achieve.

3. Defining effective safety standards

These are general requirements for the global regulatory system and its implementation.

Another important aspect of the effectiveness of regulation is the way safety standards are defined. As far as the current technologies of reactors, and especially LWR, are concerned, we have today elaborated safety standards, based on the work of several years and benefiting from the experience of more than 400 reactors operating in the world.

The situation is, of course, different for fuel cycle facilities, which are much less numerous, and for new technologies such as HTR or Fast Breeders. In both cases, we must recognize that we must adapt to each specific situation.

It is obvious: a fuel cycle facility (FCF) is not a reactor. Even though the basic hazards to consider are the same (for example irradiation, fire, criticality, loss of containment...), the technology and the type of accidents are different. The peer reviews and the international feedback from best practices, that would give data for the standards, are very limited, because fuel cycle facilities exist only in a few numbers for each step of the fuel cycle.

As a consequence, fuel cycle facilities' standards cannot be strictly derived from NPP reactors' standards with a simple electronic "search NPP", "replace with reprocessing" or "replace with uranium fuel fabrication" or "replace with MOX fuel fabrication", etc... We must resist the tendency to have strictly a fuel cycle IAEA standard corresponding to each NNP standard. It is the same reason that makes NPP standards in most cases not appropriate to fuel cycle facilities.

FCF Safety Standards should take a wider angle to safety rather than be simply prescriptive. To take an example, the safety standards shall not give the number of rounds to screw the bolt, they should look at the process to be used to determine this number of rounds.

Also, FCF compliance to safety standards relies on individual safety demonstration rather than applying generic solutions: the standards set the objective to be reached, and the safety demonstrations will give the solutions to reach the objective, solutions different from one process to another (conversion, enrichment, fuel fabrication...).

The next question is: at what level are the standards drawn?

To be consistent with the operator's needs and expectations outlined above:

- Basic safety standards, those that give reference levels, should be at the international level. It implies multinational work among national regulators, not forgetting to take into account the feedback from industry. There is definitively a role for the IAEA in the elaboration of those basic safety standards; the experience of international regulators' associations such as WENRA is also very valuable.
- National regulations are necessary, for one-site licensing, for control of compliance, for safety evaluation of ageing facilities. Those national regulations have to be consistent between the different countries. It implies that, at the international level, common methods are defined by a network of regulators. And national regulators must consider the possible use, for a license application, of a safety analysis report made in another country for licensing the same design abroad.

The same process could be applied, in principle, to defining safety standards of reactors of new technologies.

4. Conclusion: factors that make an effective regulatory system.

To sum-up, we can offer some views towards an effective regulatory system that would help both regulators and the industry improving safety, and offering savings.

As enabling factors:

- An international reference of what is "safe", an international reference that sets objectives, not solutions. The solutions have to be left to be proposed by the operator.
- An international agreement on what is devoted to the national level, and what is shared at the international level.
- Common methods to derive national implementation of the control.

As key factors:

- The existence of a dialogue within industry, regulators, stakeholders to foster a shared view towards ways to improvement of safety. But in this dialogue, each party must be careful to keep its role.
- Share regulators (and operators) best practices, country to country, to reinforce knowledge of each other: in this field, there are already some initiatives launched or existing: WENRA, MDAP, IRRS (and also WANO, INSAF).

Let's conclude with two key words: consistency and independence:

- Consistency from the international to the national level, and consistency between what the regulator requires and the solutions implemented by the industry.
- Independence, because each party has its own responsibility.

And a fact: the industry's commitment towards safety is one of its best assets for its sustainable success.