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2011, a pivotal year for nuclear safety

For ASN, 2011 is the fiftieth anniversary of the creation of the basic nuclear installations regime, the fifth anniversary of the creation of ASN and, finally, the year of the Fukushima disaster.

50th birthday
of the basic nuclear installation.

In the 1950s, the Minister of Health tasked the central service for the protection against ionising radiation (SCPRI) with handling radiation protection issues; the French atomic energy commission (CEA) for its part dealt with regulating the safety of its own facilities. The Government felt no need to establish a regulatory system that involved them directly. The very notion of nuclear facilities – later to be known as "basic nuclear installations (BNI)" – that represented a particular risk requiring monitoring and regulation, did not even exist.

This notion came about in France almost unintentionally, as a result of international constraints. The Euratom Treaty, signed in 1957, stipulated that nuclear facilities should be subject to a regime of authorisation, or at the very least notification; moreover, the Paris Convention on Nuclear Third Party Liability, signed in 1960, required identification of the facilities which could be the source of any damage.

To establish the basic nuclear installations administrative regime, the Government then chose a relatively unusual legislative vehicle; a bill concerning mitigation of atmospheric pollution, which became the atmospheric pollution and odours Act. This bill, submitted by the Government in 1960, did not primarily target industrial facilities, which had been regulated for a long time by a law dating back to 1917. It was therefore aimed mainly at other sources of potential atmospheric pollution: vehicles, non-industrial facilities such as domestic hearths and diffuse sources.

However, the text of the Government's draft contained the word radioactive: radioactivity was just beginning to be recognised as a component of ambient atmospheric pollution, mainly as a result of the atmospheric atomic tests being carried out by the major powers.

It was thus designated as the appropriate medium for introducing an administrative regime for basic nuclear installations, in order to meet France's international obligations.

One could be forgiven for thinking that it would have been simpler to change the nomenclature of installations covered by the 1917 Act on classified installations and simply add nuclear facilities.

There would appear to be two reasons for not having done so:
– the scope of the 1917 Act was then limited to industrial and commercial establishments; however CEA's sites, which housed a large number of the nuclear facilities, did not fall into this category;
– the other reason was the extremely specific technical nature of these facilities, which justified centralised monitoring and regulation, by specialised individuals, whereas the principle of the classified facilities was that the inspectors of these facilities be appointed in each *département*[1] by the *préfet*[2], and be able to cover all facility categories.

The first provisions concerning nuclear facilities were therefore incorporated into an Act dealing with mitigation of atmospheric pollution and odours. According to the minutes of the debates in the National Assembly and the Senate, the members of parliament showed that even at that time, they were aware of the problems of radioactivity:

1. In a *département*, representative of the State appointed by the President
2. Administrative region headed by a *préfet*

the problem of ambient radioactivity as a result of atomic testing was highlighted by a number of speakers. Fewer speakers however mentioned nuclear facilities, although one member of parliament did express concern about sites too close to Paris.

This is how the BNI came about, almost as an afterthought.

ASN is 5 years old.

In November 2006, the ASN Chairman, André-Claude Lacoste, stated that the creation of ASN would lead initially to little change but that after five years, we would be able to see how far we had come. I believe that the best way to talk about these five years is to present the significant milestones reached during the period, although this choice has to be somewhat arbitrary given the wealth of potential topics:

The lessons learned from the Épinal and Toulouse accidents

Following these accidents, ASN took steps to promote the safety of radiotherapy treatment.

For example:
– jointly with the French Society for Radiation Oncology (SFRO), by creating the scale for rating radiation protection events affecting patients receiving radiotherapy treatment;
– by recommending an increase in the number of radiological physicists;
– by suspending the operations of several radiotherapy centres as a result of major anomalies;
– by organising an international conference in Versailles, in 2007, entitled "Advances and challenges in radiation protection of patients";
– by adopting a decision concerning radiotherapy quality management in 2008.

BNI regulatory provisions

The regulations applicable to BNIs were already well under way with the "BNI procedures" decree of 2007. The BNI order was published on 7th February 2012 and a dozen regulatory decisions are already well advanced: this work was extensively discussed with the various stakeholders. ASN will be implementing a complete and rigorous working and intervention framework that is consistent with that of its European colleagues, as it is using the "reference levels" of WENRA, the Western European Nuclear Regulators' Association.

Source security

Source security is a new role, taken on by ASN in 2008. ASN is making active preparations for effective performance of this role, which requires legislation: the Government has decided to include it in the draft bill ratifying the ordinance codifying the TSN Act and to table it before the Senate. It could thus be passed by the next Parliament.

Transparency on environmental matters

Jointly with the Institute for Radiation Protection and Nuclear Safety (IRSN) and the stakeholders, ASN has developed the www.mesure-radioactivite.fr website which collates all environmental radioactivity measurements made by the licensees, institutions and approved associations. The events of Socatri, Fukushima and Centraco have shown that the public is increasingly interested in these questions.

Continued operation of the 900 MWe reactors

ASN has issued an initial generic opinion on the continued operation of the 900 MWe reactors beyond thirty years. This assessment will need to be supplemented by a position statement reactor by reactor. This has already been done for Tricastin 1 and Fessenheim 1.

Monitoring the EPR construction site

ASN is heavily involved on a day to day basis in monitoring of the Flamanville 3 construction site. This is an activity that had to be re-learned after more than ten years with no construction work on such a scale. This monitoring is leading to a number of important decisions, such as the decree creating this facility, suspension of the site, in particular the concrete pouring activities, or the joint position statement by the British, Finnish and French regulatory authorities concerning the architecture of the EPR reactor's instrumentation and control system.

Production of the PNGMDR

This is a requirement of "the other 2006 Act", that concerning radioactive waste. ASN and the ministry responsible for ecology have, since then, drafted two editions of the national radioactive material and waste management plant.

Construction of the European nuclear safety and radiation protection area

Over the past five years, nuclear safety and radiation protection in Europe has been strengthened:
– WENRA finalised its "safety reference levels" for the European power plants in service and each of its members has agreed to incorporate them into its national regulations;
– WENRA drafted safety objectives for new reactors;
– HERCA, the association of Heads of European Radiological Protection Competent Authorities, was created;
– the European Union issued two directives, one on nuclear safety and one on the management of radioactive waste and spent fuel;
– ENSREG, a grouping of all the European safety regulators and the Commission, has been adopted as an advisory body for the European institutions;
– the first European conference on nuclear safety was held in Brussels in the post-Fukushima context.

Dose optimisation in medical imaging

Exposure linked to medical examinations has increased by more than 70% in five years.

ASN organised a seminar on medical imaging in order to raise the awareness of institutions, professionals and manufacturers of the need for more rigorous application of the principles of radiation protection (justification of procedures and dose optimisation) and the development of alternative techniques, a prime example of which is MRI.

Following on from this seminar, it issued several position statements on this subject last July.

The post-accident approach

Post-accident doctrine is being clarified: it is presented in guidelines, tested during exercises and should be integrated into the off-site emergency plans (PPI).

The full value of an approach such as this became apparent at the time of the Fukushima accident. It was presented to the Codirpa international seminar on 5th and 6th May 2011.

And now to 2011.

What a contrast between the beginning of the year, when ASN was criticised by some for over-playing the safety card and issued warnings concerning the risk of creating a two-speed nuclear world, and the end of 2011 in the wake of the Fukushima accident! 2011 will remain synonymous with Fukushima.

This accident is a major event and it will for ever mark the history of nuclear power, as did Three Mile Island and Chernobyl: there will be a before and after Fukushima.

As early as 11th March, ASN foresaw the potential scale of this natural disaster, combined with a nuclear crisis. Its emergency centre was activated on the afternoon of 11th March and remained operational round the clock, 7 days a week, until 13th April. Its activities were subsequently scaled back but it remained operational for a considerable time.

Two hundred people, or nearly half the ASN workforce, in the regions and the Paris area, were mobilised in the emergency centre.

Daily audio-conferences were held with IRSN, the International Atomic Energy Agency (IAEA), the foreign safety regulators and the French Embassy in Japan.

During the course of this first month, the level of communication was intense, with ASN holding seventeen press conferences and publishing twenty-eight press releases. About fifteen staff were mobilized to answer 1200 media queries. A special website was created and received more than 700,000 hits. A call centre was set up to answer the public's questions.

At the same time, ASN initiated the complementary safety assessments (CSA) process. In addition to these CSAs, ASN in 2011 organised a campaign of targeted inspections on topics related to the Fukushima accident. Thirty-eight inspections were thus carried out on all the nuclear facilities felt to be high-priority, corresponding to a total of one hundred and ten days of inspection.

ASN also wanted to ensure that this process was transparent and to involve civil society. Therefore the members of the local information committees (CLI) and foreign experts, representing a total of fifty people, were able to take part in the inspections. Foreign experts and members of the French High Committee for Transparency and Information on Nuclear Security (HCTISN) took part in the meetings of the Advisory Committees of experts, which for three days in November brought together more than two hundred people.

ASN received and took full account of numerous contributions from the CLIs, the ANCCLI, foreign experts and trade union organisations

Given the exceptional nature of this situation, ASN made public in real-time the reports from its licensees, that from the IRSN produced at its request and the opinions of the Advisory Committees. ASN published its report and its opinion on 3rd January 2012.

ASN worked with the HCTISN, which issued two opinions, one on 3rd May concerning the specifications for the complementary safety assessments, the other on 8th December concerning the transparency of the process. The involvement of the HCTISN and the CLIs represented a crucial contribution to the necessary transparency and openness of this entire approach.

Considerable work was done in a very short time, commensurate with the scale of the disaster.

This work needs to be continued nationally, at a European level, and internationally. It must concern both the safety of the facilities and the management of emergencies.

The commitment, professionalism and availability of the ASN and IRSN staff, as well as the considerable work they have done since 11th March 2011, has enabled ASN to learn the first lessons from the Fukushima accident, for which complete experience feedback analysis will take many years.

These three periods - 50 years, 5 years, last year - remind us that the time-scale of change in nuclear safety, radiation protection and their regulation, is a very long one. It is essential that adaptation is always based on experience feedback and stringency and vigilance must be the watchwords at all times. ■