REGIONAL OVERVIEW OF NUCLEAR SAFETY AND RADIATION PROTECTION

CHAPTER 8

REGIONAL ORGANISATION

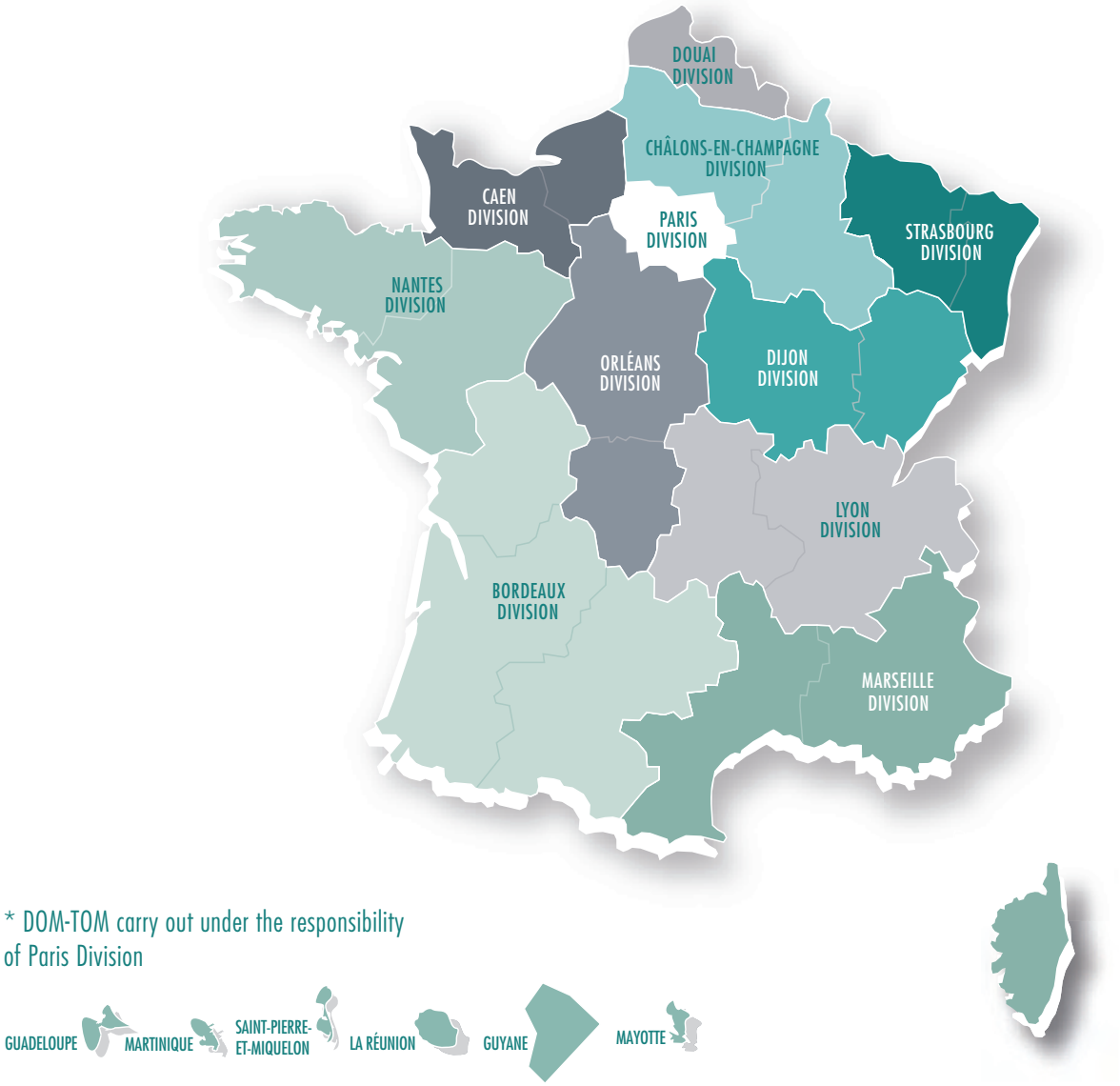
ASN has 11 regional divisions through which it carries out its regulatory responsibilities nationwide and in the Overseas France and Territorial Communities.

The ASN regional divisions carry out their activities under the authority of regional representatives.

The ASN divisions carry out direct inspections on the basic nuclear installations (BNIs), on radioactive material transport and on small-scale nuclear activities and investigate most of the licensing applications submitted to ASN by the nuclear activity licensees within their regions.

In emergency situations, the divisions assist the préfet* of the département**, who is responsible for protection of the population, and carry out on-site monitoring of the operations to safely operate the installation. To ensure preparedness for these situations, they take part in preparing the emergency plans drafted by the préfets and in periodic exercises.

The ASN divisions contribute to the public information duty. They for example take part in the meetings of the local information committees (CLIs) and maintain regular relations with the local media, elected officials, associations, licensees and local administrations.



* In a *département*, representative of the State appointed by the President.

** Administrative region headed by a *préfet*.

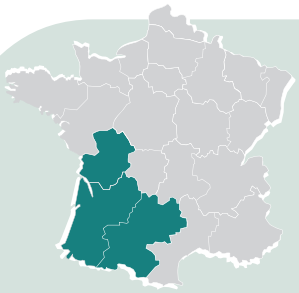
ASN ASSESSMENT OF NUCLEAR SAFETY AND RADIATION PROTECTION AT THE LOCAL LEVEL

The purpose of this chapter is, in addition to ASN's overall assessment of nuclear safety and radiation protection for each major activity and main licensee, to present an assessment of the situation observed locally by the ASN divisions.

The following sheets give a site by site review of nuclear safety and radiation protection in the nuclear installations of a given region: from the nuclear power plant (NPP) to the fuel cycle plants, from installations in operation to those undergoing decommissioning and from research facilities to radioactive waste disposal centres. The ASN divisions also give their view of radiation protection in the medical and industrial sectors and highlight a number of local actions particularly representative of the work done by ASN in the regions.

This new chapter, with its regional focus, is in line with that proposed on the new website www.asn.fr. Through its various information media, ASN thus aims to offer easier access to local information: from the latest news from the ASN divisions to life in the installations.

BORDEAUX



1 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE AQUITAINE, POITOU-CHARENTES AND MIDI-PYRÉNÉES REGIONS REGULATED BY THE **BORDEAUX** DIVISION

The Bordeaux division is responsible for regulating nuclear safety and radiation protection in the 17 *départements* of the Aquitaine, Poitou-Charentes and Midi-Pyrénées regions.
As at 31 December 2009, the workforce of the ASN Bordeaux division stands at 21 officers: 1 regional head, 2 deputies, 14 inspectors and 4 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Aquitaine, Poitou-Charentes and Midi-Pyrénées by the ASN Bordeaux division, includes:
– the Le Blayais NPP (4 reactors of 900 MWe);
– the Civaux NPP (2 reactors of 1,450 MWe);
– the Golfech NPP (2 reactors of 1,300 MWe);
– 23 external radiotherapy departments;
– 8 brachytherapy departments;
– 24 nuclear medicine departments;
– 150 departments carrying out interventional radiology procedures;
– 150 tomography devices;
– about 6,400 medical and dental radiodiagnostic devices;
– 32 industrial radiology companies;
– 600 industrial and research equipment items.

In 2009, the Bordeaux division carried out 69 inspections in the field of nuclear safety and conventional safety in the Le Blayais, Civaux and Golfech NPPs and 149 small-scale nuclear facility inspections in the Aquitaine, Poitou-Charentes and Midi-Pyrénées regions.

No incident higher than level 1 on the INES scale or the ASN-SFRO scale was notified to the division in 2009.

1|1 Assessment of BNI nuclear safety

Le Blayais nuclear power plant (Gironde département)
In 2009, EDF replaced the steam generators in reactor 1 of the Le Blayais NPP. ASN considers that this very large project was correctly managed and executed. A number of areas for progress were nonetheless identified and they will help improve similar operations in the future on other reactors.
ASN underlined the good management of unforeseen technical events in the Le Blayais NPP, first of all during the winter storms and then during the reactor outages. ASN considers that the quality of preparation for and management of the maintenance operations is down on previous years and that progress is required in this field in order to guarantee that maintenance is both rigorous and calm at all times. ASN however considers that the NPP has made progress in worker radiation protection and that its response organisation for management of emergency situations is still satisfactory.

Civaux nuclear power plant (Vienne département)
ASN considers that the Civaux NPP stands out with regard to radiation protection and that it is progressing in its management of maintenance operations. However, shortcomings were observed in the programming and rigorous performance of the periodic tests which are used to verify the correct operation of the equipment contributing to reactor safety.
In 2009, ASN examined and adopted two new decisions managing discharges and water intake for the Civaux NPP. This dossier was the subject of a public inquiry, in the Vienne and Indre-et-Loir départements, along with consultation of the Civaux CLI.
In the light of certain significant events notified in 2009, the division conducted inspections which showed that there was a drop in the stringency of routine reactor operation. Progress in implementing operating rules and having checkpoints validated by the hierarchical superiors is therefore expected in 2010. ASN considers that the Civaux NPP performs well in the field of worker radiation protection.

Golfech nuclear power plant (Tarn et Garonne département)
ASN considers that the Golfech NPP stands out with regard to nuclear safety, radiation protection and the site environmental protection. ASN considers that both operation and maintenance are satisfactory and that worker radiation protection on the site is of a good standard. ASN notes the site's dynamic approach to controlling its chemical discharges into the environment. It will however need to continue to make efforts to comply with the technical requirements applicable to non-nuclear installations.

1|2 Assessment of radiation protection in the medical field

In 2009, for the third year in succession, the division's inspection of all radiotherapy departments revealed varying degrees of progress in the organisation and traceability of the interventions in the departments and the

Presentation of the industrial radiology regulations by two radiation protection inspectors from the Bordeaux division during a professional non-destructive testing conference (Bordeaux, 1 October 2009)

beginnings of an operating experience feedback approach. This proactive move to improve treatment safety will need to be consolidated in 2009, including with regard to the formalisation of procedures, the organisation of the medical physics teams and the notification to ASN of undesirable events.

The Bordeaux division intensified its inspections in the field of interventional radiology and the use of X-rays in the operating theatre. Numerous shortcomings in worker and patient radiation protection were observed during the course of the 29 inspections carried out in operating theatres, including the failure to wear dosimeters by the health professionals and a lack of optimisation of the equipment delivering the ionising radiations.

1|3 Assessment of radiation protection in the industrial and research sector

The Bordeaux division is continuing to regularly check industrial radiology techniques, which are activities with high radiation protection stakes. The 13 inspections carried out in 2009 on this topic confirmed that although the companies generally follow the regulations concerning ionising radiations, progress is needed in the precise definition of radiation protection zoning along with improved coordination between the lead contractors and their subcontractors.

A number of establishments also notified ASN that they had found radioactive sources in their premises, some of which had been left there many years previously. These events are indicative of deficiencies in the past traceability of radioactive sources.

There is also room for improvement in how worker radiation protection requirements are managed in research centres. Workstation studies to describe personnel exposure must be systematically drawn up and the coordination between the various entities and organisations handling the sources of ionising radiations need to be better defined, and even given a contractual format.

1|4 Assessment of radioactive material transport

La division de Bordeaux a procédé en 2009 à 5 inspections portant sur les transports de radionucléides à usage médical. Elle estime que, si la réglementation relative au The Bordeaux division carried out 5 inspections in 2009 on the transport of radionuclides for medical purposes. It considers that even if radioactive material transport regulations are on the whole correctly followed, the mandatory documents need to be more systematically filled out and the exposure of drivers of “utility” type vehicles transporting radioactive packages needs to be better managed.

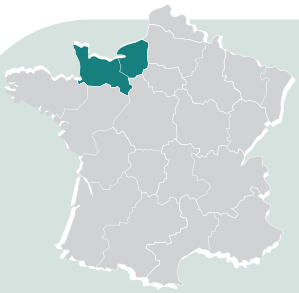
1|5 International action by the Bordeaux division

Relations with the Spanish nuclear regulator

Within the framework of ASN’s regular relations with CSN, the Spanish nuclear regulator, two inspectors from the Bordeaux division took part in a cross-inspection during a reactor outage at the Cofrentes NPP. This was an opportunity to discuss inspection and regulation practices within the two regulators, the tools for evaluating the level of safety on nuclear sites and transparency.

1|6 The other significant events in Aquitaine, Poitou-Charentes and Midi-Pyrénées

In 2009, the Bordeaux division held 2 press conferences on the state of nuclear safety and radiation protection.



2 LTHE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE BASSE AND HAUTE-NORMANDIE REGIONS REGULATED BY THE CAEN DIVISION

The Caen division is competent to regulate nuclear safety and radiation protection in the 5 départements of the Basse and Haute-Normandie regions. The Caen division also covers the Monts d'Arrée site (Brennilis NPP currently undergoing decommissioning) in the Bretagne region.
As at 31 December 2009, the workforce of the Caen division stands at 28 officers: 1 regional head, 4 deputies to the regional head, 19 inspectors and 4 administrative officers under the authority of a regional representative.

The activities and installations to be regulated in Normandie and Bretagne by ASN's Caen division comprise:
– the EDF NPPs at Flamanville (2 reactors of 1,300 MWe), Paluel (4 reactors of 1,300 MWe) and Penly (2 reactors of 1,300 MWe);
– the construction site for the future EPR Flamanville 3 reactor;
– the AREVA NC spent nuclear fuel reprocessing plant at La Hague;
– the ANDRA Manche repository
– GANIL national large heavy ion accelerator (Caen)
– the Brennilis NPP (Finistère *département*) undergoing decommissioning;
– small-scale nuclear activities: 8 radiotherapy centres (23 devices); 3 brachytherapy departments; 11 nuclear medicine departments; 60 users of tomography devices; 35 interventional radiology departments; 750 medical radiodiagnostic devices; 1,400 dental radiodiagnostic devices; 19 industrial radiography companies; 250 industrial and research devices; 6 head offices and 19 branches of organisations approved to carry out radiation protection inspections.

In 2009, the Caen division carried out 167 inspections of nuclear installations in Normandie and Bretagne: 73 inspections in the NPPs at Flamanville, Paluel and Penly, including an in-depth inspection of the Flamanville NPP on the topic of organisational and human factors; 33 inspections on the construction site of the future EPR Flamanville 3 (FA3) reactor; 59 inspections on fuel cycle or research installations or installations undergoing decommissioning, including 50 inspections of the AREVA NC plant at La Hague; 57 were carried out in 2009 on small-scale nuclear facilities in Normandie.

No incident of a level higher than 1 on the INES scale or the ASN-SFRO scale was notified to the division in 2009. However, one event rated level 2 on the INES scale, concerning irradiation of a worker from the ABC company (HORUS IEG) during a gamma radiography inspection of a weld in the Flamanville NPP, was notified to the ASN Dijon division.

1 | 1 Assessment of the BNI nuclear safety

AREVA NC plant at La Hague
ASN considers that the results for the La Hague plants are satisfactory, including with regard to personnel exposure. ASN does however believe that efforts must continue to be made, in particular in the installation periodic safety reviews, the drafting of the general operating rules and the definition of elements important for safety. Furthermore, some significant events highlighted a lack of rigour in the operation of the units.

With regard to the recovery of legacy waste, ASN is worried about AREVA NC's strategy U-turn, which is significantly delaying the recovery and evacuation of waste from the 130 and HAO silos. There again, ASN will ensure that there is no further slippage in the schedule.

Flamanville nuclear power plant
ASN considers that in 2009, as in 2008 and despite some progress, the Flamanville NPP's nuclear safety performance is down in relation to ASN's general assessment of EDF performance. ASN considers that the stringency plan put into place improved certain aspects of the safety of operation and maintenance. However, this improvement process remains dependent on unforeseen events during operation or maintenance, of which there were again many in 2009. The NPP licensee must therefore persevere in this direction. This assessment is based in part on the results of the in-depth inspection from 11 to 15 May 2009 run by a team of ten ASN inspectors and 9 experts from the Institute for Radiation Protection and Nuclear Safety (IRSN), on the topic of rigorous operation.

After an examination process which began in 2005, when EDF submitted a dossier applying for renewal of its discharge license for the Flamanville site, including a public inquiry held in March 2007, the ASN Caen division at the end of 2009 presented the draft discharge and water intake requirements to the CLI and to the Departmental Council for the Environment and for Health and Technological Risks. These two bodies issued a favourable opinion on the project presented. This process should lead to the issue of a new licence in early 2010.

1.Waste storage silo (waste from French Gas Cooled Reactor (GCR) fuel).
2.Oxide high-activity facility in the former UP2-400 plant, in which spent fuel elements were unloaded, stored, sheared and dissolved.

Paluel nuclear power plant

ASN considers that the Paluel NPP has made progress in the quality of its maintenance work, its post-maintenance qualification of equipment and the rigorousness of its installation operation. However, the relatively high number of significant safety events confirms the fact that the plant must continue with its efforts to further improve its safety results. ASN also considers that the major investments made in the installations led to a positive impact on environmental protection, radiation protection and safety.

Penly nuclear power plant

ASN considers that environmental protection and worker radiation protection on the site are on the whole satisfactory and that it stands out in terms of operations safety. The checks on the Penly NPP in 2009 revealed no particular difficulty, except for the internal organisation of pressure equipment monitoring, which needs to be improved.

Construction of the EPR Flamanville 3 reactor

In 2009, the ASN inspection on the EPR construction site concerned technical topics such as civil works, initial electromechanical erection work, electrical systems and non-destructive testing, as well as the organisation and management of safety on the construction site or the impact of the construction site on the safety of the Flamanville 1 and 2 reactors.

Following these inspections and the examination of any deviations, ASN considers that the compensatory measures taken in 2009 by EDF and the main civil engineering contractor following the events of 2008, contributed to maintaining the quality of the work done. In 2009, ASN also paid particular attention to welding activities. However, during its inspections, ASN noted the numerous waivers to the requirements applicable to the construction site in the civil engineering sector, and believes that greater rigour is required in identifying and justifying these waivers. Moreover, following its inspections, ASN observes that the organisation of the initial erection work on the electromechanical systems could be improved. It cannot as yet benefit from any positive operating experience feedback from the organisation of civil engineering activities. Finally, ASN is exercising vigilance to ensure that the pressure from the construction schedule has no negative impact on the quality of the work.

During the inspections carried out in 2009, the ASN conventional safety inspector in charge of inspecting the Flamanville 3 construction site, adapted his activities to the issues involved in the significant rise in the number of workers present and the diversification of the construction activities, and therefore the risks, taking place on the site. The conventional safety inspector, together with the other competent Government departments, therefore focused in particular on checking compliance with the requirements of labour law relative to the secondment of foreign workers and to staff safety on the construction site.

ASN inspection of sea transport of radioactive materials at the port of Le Havre – October 2009

ANDRA's Manche repository

In January 2009, ANDRA sent ASN the final safety report for the entire installation, along with a file explaining the benefits to be gained from installing a new cover on the repository in order to ensure its long-term passive safety. These files were analysed by the Advisory Committee for waste prior to ASN issuing its position statement. In 2009, ANDRA also carried out work to repair the cover over a part of the facility. This work checked the satisfactory resistance of the tightness membrane at a point where settling of the waste block had led over the years to settling of the cover.

GANIL (national large heavy ion accelerator)

In 2009, ASN noted gradual deterioration of the way in which nuclear safety and radiation protection issues were handled at GANIL. ASN will remain particularly vigilant with regard to the steps taken by GANIL to remedy this situation, including with regard to the 2009 submission of an application for a license to extend the existing facility, to build a facility called SPIRAL 2 (2nd generation radioactive accelerated ion beam production source).

The Brennilis NPP (Finistère département) undergoing decommissioning

In a decision of 8 October 2007, ASN set the regulatory framework applicable to the plant, as well as the operations that could be carried out pending the issue of a new decree authorising its decommissioning. One of the aspects of this decision was to require that the licensee

repackage and remove the legacy waste stored on the site, for which there is or will soon be a disposal route. ASN primarily checked the waste repackaging and removal operations and considers that greater rigour is required in the control and monitoring of these operations.

As part of the review procedure for the decommissioning application submitted by EDF, the Brennilis CLI carried out a detailed analysis of the application dossier, with the assistance of an assessment by ACRO (Association for the Control of Radioactivity in the West). The CLI organised 4 plenary meetings dedicated to this subject and called a public meeting which attracted about a hundred participants. Further to this process, the CLI gave its approval, but with additional requests and observations.

1 | 2 Assessment of radiation protection in the medical field

For the third year in succession, the Caen division inspected all the radiotherapy departments in Normandie in 2009. These inspections showed that there was very real progress in the rigorousness, organisation and traceability of interventions. However, despite the extra staff in some centres, most radiotherapy centres in Normandie are under-staffed, including in medical radiological physics. These difficulties are often an obstacle to progress.

The Caen division intensified its checks in the interventional radiology sector and the use of X-rays in operating theatres. This field entails risks for both patients and workers that have to be managed. The inspections carried out revealed many areas for improvement, including with regard to the training and qualification of the staff using the equipment, equipment quality controls, the quality of staff individual protective equipment, medical monitoring of non-salaried workers, and optimisation of practices in this sector.

1 | 3 Assessment of radiation protection in the industrial sector

Inspection of industrial radiology is a priority for the Caen division, with its unannounced night-time inspections of the work in progress being repeated in 2009. Depending on the companies, these inspections brought to light a widely contrasting picture of the handling of worker exposure to ionising radiations. At the same time, the Caen division, together with the Haute-Normandie Regional Labour, Employment and Professional Training Directorate (DRTEFP[3]) and the Regional Health Insurance Fund (CRAM), is continuing to disseminate and promote good practices in this field, by urging the clients and the radiology contractors to adhere to a regional Charter drawn up in December 2007 at the instigation of ASN and the conventional safety inspectorate. To date, about forty companies have signed up.

1 | 4 Assessment of radioactive material transport

The division's inspections in the nuclear installations in Normandie on the subject of radioactive material transport confirmed that the organisation in place is on the whole satisfactory, with a good degree of involvement by the transport security advisers.

1 | 5 International action by the Caen division

Because of EPR type reactors are being built at Olkiluoto in Finland and Flamanville in France, the ASN Caen division takes part in the intense cooperation between ASN and the Finnish nuclear regulator (STUK). In 2009, two technical meetings and two cross-inspections took place on the Flamanville 3 and Olkiluoto 3 construction sites, on the topic of civil engineering. Similarly, as part of the bilateral relations with the American nuclear regulator (NRC), detailed discussions of inspection methods took place during a cross-inspection on the Flamanville 3 construction site, at which two NRC inspectors took part. Finally, an inspector from the Swiss nuclear regulator (ENSI) took part in a cross-inspection on the Flamanville 3 construction site. The inspection concerned organisational and human factors on the site.

1 | 6 The other significant events in the Basse and Haute-Normandie regions

CLI activity

The consultation bodies created for the Monts d'Arrée NPP at Brennilis in the Finistère *département* and for the Manche waste repository were replaced by ordinary CLIs. A CLI was also created for GANIL in Caen in the Calvados *département*.

Public information

ASN helped organise a symposium with the *Conseil général** and the CLIs on 29 April 2009 devoted to epidemiology and the impact of tritium discharges around the

* *Département*-level elected council.

3. Regional Directorate for Labour, Employment and Professional Training.

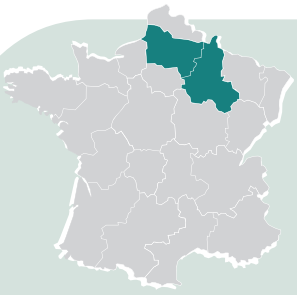
NRC/ASN joint inspection on the EPR FA3 construction site (Manche *département*) – October 2009

nuclear sites on the Cotentin peninsula. The main results presented were summarised in an information bulletin, 55,000 copies of which were printed and distributed to the mailboxes of the residents of the communes** on which the nuclear sites are situated.

In 2009, the Caen division held 2 press conferences on the state of nuclear safety and radiation protection.

** Smallest administrative subdivision administered by a mayor and a municipal council.

CHÂLONS-EN-CHAMPAGNE



3 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE PICARDIE AND CHAMPAGNE-ARDENNE REGIONS REGULATED BY THE CHÂLONS-EN-CHAMPAGNE DIVISION

The Châlons-en-Champagne division is responsible for regulating nuclear safety and radiation protection in the 7 *départements* of the Champagne-Ardenne and Picardie regions.
As at 31 December 2009, the workforce of the Châlons-en-Champagne division stands at 13 officers: 1 regional head, 2 deputies to the regional head, 8 inspectors and 2 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Champagne-Ardenne and Picardie by the Châlons-en-Champagne division comprise:
– the Chooz A NPP (currently being decommissioned);
– the Chooz B NPP (two reactors of 1,450 MWe);
– the Nogent-sur-Seine NPP (two reactors of 1,300 MWe);
– the low and intermediate level short-lived radioactive waste repository located at Soulaines-Dhuys in the Aube *département*;
– ANDRA's underground research laboratory in Bure, in preparation for the creation of a geological repository for high level long-lived radioactive waste;
– about a hundred licensed medical establishments, including: 12 radiotherapy departments, 4 brachytherapy departments, 13 nuclear medicine departments;
– about 300 licensed industrial activities, with more than one third of the licenses being for possession of devices to detect lead in paint;
– about twelve research laboratories, mainly situated in the universities of Champagne-Ardenne and Picardie.

In 2009, the ASN Châlons-en-Champagne division carried out 51 inspections on nuclear installations (EDF NPPs, radioactive waste processing facilities) and 61 inspections in the field of small-scale nuclear activities.

No incident of level higher than 1 on the INES scale was notified to the division in 2009.

In the field of small-scale nuclear activities, there was 1 level 2 incident on the ASN-SFRO scale in a medical brachytherapy unit at Amiens university hospital.

1|1 Assessment of BNI nuclear safety

Nogent-sur-Seine nuclear power plant

ASN considers that Nogent-sur-Seine NPP is continuing its efforts to deploy an operating stringency plan. The results from the Nogent-sur-Seine NPP are on the whole satisfactory with respect to safety, pressure equipment, the environment and radioactive material transport. With respect to radiation protection, the dosimetry results have also remained satisfactory, despite a number of weak points identified in the stances adopted by the EDF ALARA-1[1] committee with a view to optimising worker dosimetry.

ASN is nonetheless expecting improvements in containment and in the quality of the associated periodic checks. Monitoring of the remedial action is not rigorous enough, including in the civil engineering field, where certain defects detected by the site a number of years ago have still not been repaired. The deadlines for the remedial action defined following significant events or ASN inspections are often exceeded, despite the many reminders sent to the EDF site's Safety Quality department, which were ignored. Once again this year, the site inspections carried out during the ten-yearly outage revealed shortcomings in radiological cleanness, site security, waste removal and fire-fighting, including in the effluent treatment building. In 2009, the Nogent-sur-Seine NPP notified three INES level 1 incidents and experienced two reactor scrams.

Chooz nuclear power plant

ASN considers that the nuclear safety and radiation protection performance of the Chooz B NPP is down: 2009 was marked by stagnation of the level of safety, including during the first outage of the year. Analysis of significant events in this area frequently shows problems with the preparation of maintenance, with failure to inform the staff of the risks involved in the work. Inadequate use of working documents, which are sometimes insufficiently explicit, is also a source of errors that can lead to deviations, for example during maintenance. Overall, human error and organisational failures are still too frequent and are a factor in 80% of the significant safety events.

With regard to radiation protection, although the NPP's organisation remains satisfactory, some results have worsened and ASN observes a certain erosion of the precautionary measures taken to guarantee radiological cleanness. On the environment, the site took account of ASN's comments on its weak points and brought in solutions that will need to be evaluated over the long-term. On this point, the Chooz NPP has demonstrated a good level of

1. "As Low as Reasonably Achievable": the radiation protection principle also known as the "optimisation principle".

ASN radiation protection inspection of the Chooz A NPP – November 2009

responsiveness. Concerning management of the risk inherent in pressure equipment, the plant's recognised inspection department (SIR) has now reached a satisfactory level of performance. In 2009, the Chooz NPP notified one INES level 1 incident and experienced one reactor scram.

With regard to the Chooz A decommissioning site, ASN hopes to see a more rigorous approach adopted by the licensee, including in the field of radiation protection, where several significant events were notified in 2009.

The waste repository at Soulaines-Dhuys and the Bure laboratory

Operation of the low and intermediate level, short-lived waste repository at Soulaines-Dhuys, and the work done by ANDRA in its Bure underground laboratory continued in 2009 with a good level of quality that is comparable with the performance of previous years.

1|2 Assessment of radiation protection in the medical field

In the field of small-scale nuclear activities, the Châlons-en-Champagne division carried out about sixty inspections in 2009 in the Champagne-Ardenne and Picardie regions. The subjects concerned included:

– external radiotherapy: the 12 structures carrying out this activity were inspected for the 3rd year in succession. Although significant changes were observed in actions contributing to treatment safety (analysis of anomalies, in vivo dosimetry, etc.), progress is still expected with regard to quality assurance. Some structures are undersized and this situation (technical zone, staff levels) will have to be improved, including by recruiting staff and/or merging with larger centres. The structures carrying out external radiotherapy activities will again be inspected in 2010;

– brachytherapy: the 4 structures performing this activity were inspected in 2009. Although the organisation of worker and patient radiation protection appeared to be on the whole satisfactory, the identification of risk factors and the associated compensatory measures needs to be improved, as indicated by the INES level 2 event that occurred in Amiens university hospital.

1|3 Assessment of radiation protection in the industrial sector

The Châlons-en-Champagne division carried out 16 inspections in the industrial field, in particular in industrial radiology facilities containing gamma radiography devices such as the GMA 2500.

The Châlons-en-Champagne division examined the significant radiation protection event that occurred on 23 October 2009, in the PSA company's plant in Charleville-Mézières. Owing to the failure of several lines of defence, this incident was rated INES level 1.

In addition to its inspection work, the Châlons-en-Champagne division also in 2009 collaborated with the Government's regional offices and ANDRA on management of the dossier concerning the former ORFLAM-PLAST plant in Pargny-sur-Saulx (51). The past activities of this plant, which closed more than ten years ago, led to radioactive pollution of the site of the plant and adjoining land. After the identification and safeguard phases concerning this land, clean-out work will continue in 2010.

1|4 Assessment of radioactive material transport

The division took part in the "radioactive material transport" emergency exercise organised by the Office of the préfet of the Aisne *département*, on 1 July 2009. It carried out 5 inspections on radioactive material transport conditions, one in each NPP and another three more specially targeted on the transport of radiopharmaceutical products to hospitals.

1|5 International action by the Châlons-en-Champagne division

The Châlons-en-Champagne division continued to maintain regular relations with AFCN, the Belgian nuclear regulator. It also took part in the meeting of the Franco-Luxembourg committee, enabling it to develop relations with Luxembourg's regulator.

ASN inspection of the ANDRA laboratory in Bure

Finally, it took part in hosting a number of foreign delegations who came to visit the Bure laboratory or the Soulaines-Dhuys repository, as well as a delegation from the Bure CLIS which went to visit the Gorleben disposal facility in Germany.

1|6 The other significant events in Picardie, Champagne-Ardenne

In the field of major risk prevention, the ASN division contributed to the review for updating of the off-site emergency plans (PPI) for the Chooz and Nogent-sur-Seine NPPs.

In 2009, the Châlons-en-Champagne division held 2 press conferences on the state of nuclear safety and radiation protection.

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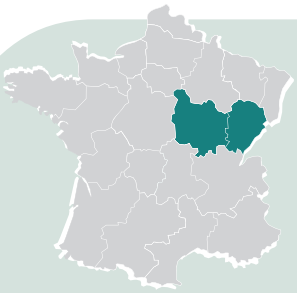


4 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE BOURGOGNE AND FRANCHE-COMTÉ REGIONS REGULATED BY THE DIJON DIVISION

The Dijon division is responsible for regulating nuclear safety and radiation protection in the 8 *départements* of the Bourgogne and Franche-Comté regions.
As at 31 December 2009, the workforce of the Dijon division stands at 7 officers: 1 regional head, 1 deputy, 4 inspectors and 1 administrative officer.

The activities and installations to be regulated in Bourgogne and Franche-Comté by the Dijon division comprise:
– 8 external radiotherapy departments (17 accelerators);
– 5 brachytherapy departments;
– 13 nuclear medicine units;
– 56 surgical units using interventional radiology;
– 36 diagnostic tomography devices;
– about 700 medical radiodiagnostic devices;
– about 1,100 dental radiodiagnostic devices;
– 230 industrial and research facilities.

In 2009, the Dijon division carried out 51 inspections: 6 inspections on the subject of radioactive material transport; 39 inspections of small-scale nuclear activities and 6 checks on organisations approved by ASN for the radiation protection inspections required by the Public Health Code and the Labour Code;

2 level 2 incidents were notified in 2009:
– the first concerns a repetitive error in radiotherapy patient positioning, which revealed the organisational and human problems in the department, including with regard to communication and the transmission of information within the department;
– the second concerns the accidental irradiation of a worker from the Horus contractor working on the Flamanville NPP (Manche *département*). It showed that despite implementing strict intervention procedures, the monitoring of human behaviour demands constant attention.

1|1 Assessment of radiation protection in the medical field

Radiotherapy. The inspection in 2009, for the third consecutive year, of all the radiotherapy departments indicated real progress in the rigorousness, organisation and traceability of interventions, albeit to varying degrees. The Dijon division nonetheless observes that some centres are still understaffed in terms of medical radiation physicists.

ASN observes a clear improvement in the extent to which the health professionals are aware of the need to detect, analyse and notify events liable to affect the health of patients or workers. However, this practice is not yet generally adopted and efforts must continue, including in the private sector and in areas other than radiotherapy.

A contrasting interventional radiology situation was identified during the inspections carried out in 2008 and 2009. Although this technique offers undeniable benefits, including by reducing the anaesthetic risk and the post-operative impact of the major procedures, it does present significant health risks to the patients and health care personnel, owing to the doses that can be delivered. The first lessons learned from these inspections in particular show that insufficient consideration is given to worker and patient radiation protection in practice, considerable disparity between the equipment used, some of which is advanced, but some obsolete, failure to systematically carry out quality controls on this equipment and a lack of investment in medical radiation physics in this field. The division will continue to focus on this topic in 2010.

1|2 Assessment of radioactive material transport

The ASN Dijon division notes an improvement in the radioactive material transport conditions, even if secure tie-down of loads could be improved, as could the rigorousness of the transporters approach to documentation requirements and safety equipment checks.

A road accident simulation exercise to test all the response services concerned, was held in the Côte-d'Or *département*. It mainly revealed that operational communication needed to be improved. This type of exercise, which is a means of maintaining the competence of the various participants in a radiological emergency, will be proposed to the other Offices of the préfet in the Bourgogne and Franche-Comté regions.

1 | 3 The other significant events in Bourgogne and Franche-Comté

The former uranium mining sites

In 2009, the ASN Dijon assisted the DRIRE in visiting virtually all the mining sites in the Saône-et-Loire and Nièvre *départements*. Samples were taken and they are currently being analysed to assess the need to increase environmental monitoring and security around some of these sites.

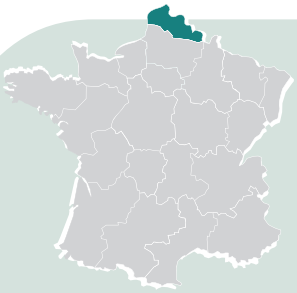
Most of the clean-out work on the Gueugnon site was carried out during the summer of 2009. The population and local associations were kept regularly informed of the progress of the work and the monitoring of the site.

Polluted sites in Franche-Comté

With regard to the management of polluted sites and soils, in particular involving radium and tritium, ASN is participating in informing the population and is examining the proposed rehabilitation levels in order to guarantee radiation protection of the public and the future users of the polluted sites. In 2009, with the closure of a company in Charquemont (25) and transfer of equipment to other plants within the group, the Dijon division checked that the clean-out objectives for this former clock-making site were appropriate. The equipment, some of which showed traces of contamination related to the former use of radium and tritium based paint, was either cleaned or scrapped. The buildings, which also show traces of contamination, will need to be rehabilitated according to the future use of the site, yet to be determined by the company.

In 2009, the Dijon division held 1 press conference concerning the state of nuclear safety and radiation protection.

DOUAI



5 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE NORD-PAS-DE-CALAIS REGION REGULATED BY THE DOUAI DIVISION

The Douai division is responsible for regulating nuclear safety and radiation protection in the 2 *départements* of the Nord Pas-de-Calais region.
As at 31 December 2009, the workforce of the Douai division stands at 16 officers: 1 regional head, 2 deputies, 5 nuclear safety inspectors and 6 radiation protection inspectors as well as 2 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Nord-Pas-de-Calais by the Douai division comprise:
– the EDF Gravelines NPP (6 reactors of 900 MWe);
– the SOMANU (nuclear maintenance company - AREVA) site in Maubeuge (Nord *département*);
Installations and activities using ionising radiations in the medical, industrial and research sectors:
– 14 external radiotherapy departments;
– 2 brachytherapy departments;
– 14 nuclear medicine departments;
– 65 tomography devices;
– 3,000 medical and dental radiodiagnostic devices;
– 1,500 industrial devices;
– 30 research laboratories.

The ASN inspectors accompanied by members of the CLI in the Gravelines NPP – September 2008

In 2009, the Douai division carried out 134 inspections: 28 nuclear safety inspections in the Gravelines NPP and the Société de Maintenance Nucléaire (Somanu) in Maubeuge, 99 small-scale nuclear activity inspections in the medical, industrial and research sectors and 7 radioactive material transport inspections.

A radiotherapy incident, rated SFRO level 2, was notified by the Centre de lutte contre le cancer Oscar Lambret in Lille (Nord *département*). It concerned an error in the dose delivered to 12 patients.

1|1 Assessment of BNI nuclear safety

Gravelines nuclear power plant

ASN considers that the safety performance of the Gravelines NPP improved as a result of the action plan implemented in the plant two years ago, enabling its performance to stand out with respect to operating stringency. The site nonetheless needs to make progress in dealing with environmental protection issues.

In 2009, the Gravelines NPP notified 7 significant safety incidents rated level 1 on the INES scale. The most serious incident concerned the blockage of a fuel assembly during maintenance of the NPP's reactor 1 in the summer of 2009.

The Société de Maintenance Nucléaire (nuclear maintenance company) in Maubeuge

ASN considers that operation of its installations is satisfactory. However, there are still areas for improvement in radiation protection for work in limited access areas, for radioactive waste sorting and removal and for transport of radioactive materials.

1|2 Assessment of radiation protection in the medical field

Radiotherapy

In 2009, the Douai division observes real improvement in rigorousness, organisation and traceability in the radiotherapy departments. The centres in the Nord Pas-de-Calais region are more affected than the national average by the shortage of radiological physicists. ASN suspended operations of the IRIDIS radiotherapy centre in Croix in July 2009 because it had no radiological physicist. Finally, in 2009, the division received notification of 15 events rated at 1 or lower on the SFRO scale and 1 event rated level 2.

Nuclear medicine

The Douai division intensified its nuclear medicine inspections. All departments were inspected once every

3 years. These inspections revealed the fact that these structures are actively involved in making progress in radiation protection.

Targeted inspections of radiology practices
Spot checks were carried out on 16 independent radiodiagnostic practices in the Nord-Pas-de Calais region on 8 and 9 June 2009. This was an opportunity to assess radiation protection and remind the practices of the main regulatory requirements applicable.

1|3 Assessment of radiation protection in the industrial and research sectors

Industrial radiology
30 companies carry out industrial radiography in the Nord Pas-de-Calais region. The inspections carried out in 2009 showed that the organisation of radiation protection in the companies had improved, as had satisfactory worker monitoring. Most of the installations comply with the technical rules. Steps must continue to be taken by the companies to work more closely with their subcontractors with regard to protection of the exposed workers.

Research
In 2009, ASN completed its inspection programme on 30 laboratories in the region. The division identified areas for improvement, including problems with the inventory of sources of ionising radiations, the completeness and frequency of the regulation checks and the extent to which the radiation protection organisation was formally defined. The division considers that these laboratories are moving in the right direction with regard to radiation protection.

1|4 Assessment of radioactive material transport

In 2009, the division developed its regulation activities in the radioactive materials transport sector. An inquiry conducted with the licensees identified the need for training in the regulations.

1|5 International action by the Douai division

In 2009, the division developed its international exchanges, including with the Belgian regulator, for mutual sharing of experience in the field of nuclear safety and radiation protection. These exchanges led to joint inspections of French and Belgian facilities and NPPs, as well as in the field of industrial radiation protection.

ASN inspection in the Gravelines NPP with members of the CLI – September 2008

1|6 Other significant events in Nord-Pas-de-Calais

Assessment of waste management by the Douai division
At the request of ASN, the Robin des Bois Association carried out a survey of the radioactive ash and phosphogypsum spoil heaps. Based on the results of this survey, the division initiated steps to implement radiological monitoring of the sites.

Division actions to improve nuclear safety and radiation protection through prevention
In 2009, in partnership with the DRTEFP and the CRAM, the division produced a charter of good practice for industrial radiography. The purpose of this charter, which was offered for signature to 20 gamma radiography companies and clients in the region, is to optimise the use of ionising radiations in this field of activity.

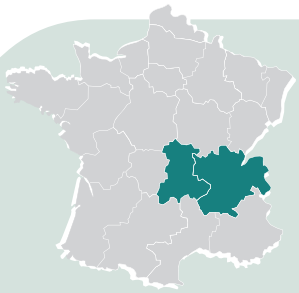
Assessment by the Douai division of licensee transparency and CLI actions
The Douai division considers that action in the field of transparency is satisfactory. The nuclear licensees published their annual report as required by Article 21 of the TSN Act.

The status of the CLIs of the Gravelines NPP and the Somanu in Maubeuge were brought into line with the requirements of the TSN Act.

Plenary session of the Gravelines CLI – September 2007

The CLI of the Gravelines NPP met on 6 occasions to examine a variety of subjects, including the plant's safety and radiation protection results, environmental monitoring, the iodine tablets distribution campaign and post-accident management. Finally, several members of the CLI took part in 3 inspections by the ASN Douai division.

In 2009, the Douai division held 2 press conferences concerning the state of nuclear safety and radiation protection.



6 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE RHONE-ALPES AND AUVERGNE REGIONS REGULATED BY THE LYON DIVISION

The Lyon division is responsible for regulating nuclear safety and radiation protection in the 12 *départements* of the Rhône-Alpes and Auvergne regions.
As at 31 December 2009, the workforce of the Lyon division stands at 36 officers: 1 regional head, 3 deputies, 15 nuclear safety inspectors, 9 radiation protection inspectors and 7 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Rhône-Alpes and Auvergne by the Lyon division comprise:
– the NPPs at Bugey (4 reactors of 900 MWe), Saint-Alban (2 reactors of 1, 300 MWe), Cruas-Meysse (4 reactors of 900 MWe) and Tricastin (4 reactors of 900 MWe);
– the FBFC nuclear fuel fabrication plants in Romans-sur-Isère;
– the nuclear fuel cycle plants on the Tricastin industrial platform;
– the high flux reactor in the Laue-Langevin Institute in Grenoble;
– Bugey NPP reactor 1 undergoing decommissioning;
– the SUPERPHÉNIX reactor undergoing decommissioning at Creys-Malville, as well as its auxiliary installations;
– the IONISOS irradiation facility in Dagneux;
– the SICN nuclear fuel fabrication plant pelletising unit at Veurey-Voroize, undergoing decommissioning;
– the CEA Grenoble reactors and plants, undergoing decommissioning;
– small-scale nuclear activities, comprising about 4,500 dentists, 500 radiologists, 800 veterinary surgeons, 100 tomography devices, 22 radiotherapy departments (including 6 which also conduct brachytherapy), 23 nuclear medicine departments, 20 gamma radiography devices, 190 electrical generators of X-rays, 30 users of unsealed sources, 200 users of lead detectors and 20 users of gammadensimeters.

In 2009, the ASN Lyon division carried out 323 inspections in the Rhône-Alpes and Auvergne regions. Of these inspections, 122 were conducted in the four NPPs, including 26 conventional safety inspections and 5 monitoring checks on approved organisations. 122 inspections were carried out on small-scale nuclear activities and 79 on the other nuclear installations regulated by the division.

In the night of 1 to 2 December 2009, following total loss of cooling of some systems of reactor 4 in the Cruas-Meysse NPP, an incident was rated level 2 on the INES scale by ASN.

1|1 Assessment of BNI nuclear safety

Nuclear power generating reactors

Bugey nuclear power plant

In terms of nuclear safety, the Bugey NPP stands out in relation to ASN's general assessment of EDF performance. During the past year, the social climate was particularly tense and a number of strikes took place. ASN also observed acceleration in the corrosion of the steam generators of reactor 3. On 1 January 2010, investigations continued, to determine whether this reactor was able to restart in its current condition. With regard to radiation protection, ASN observes that the site had made no real progress in 2009. Efforts are expected, among other things, in radiological cleanness.

Bugey nuclear power plant reactor 1 undergoing decommissioning

2009 was marked by a change in the installation's safety requirements with the publication at the end of 2008 of the complete decommissioning decree for Bugey reactor 1. The studies and work concerning decommissioning of the installations continued, while the site carried out modifications to the waste areas, upgraded the ventilation and repackaged the waste resulting from final shutdown. One of the key projects in 2009 was the appraisal and assessment of the vessel. This involved high stakes, both for the subsequent vessel decommissioning operations, and in terms of risk management. The Lyon division therefore carried out an inspection of this worksite, the results of which were satisfactory, both from the risk management and the subcontractor monitoring viewpoints.

Saint-Alban nuclear power plant

With regard to nuclear safety, ASN considers that the NPP's performance is down, owing to recurring failings in the monitoring of maintenance activities. With regard to radiation protection, ASN notes a worsening of the situation, as illustrated by the poor results obtained by EDF during the scheduled maintenance and refuelling outage for reactor 1. With regard to the transport of radioactive materials, the NPP made progress in 2009, given that ASN had been pointing out recurring weaknesses in this area for several years. Finally, ASN notes a persistent failure in the plant in its environmental protection actions.

Cruas-Meysse nuclear power plant

In 2009, the Cruas-Meysse NPP continued its efforts to deploy a safety improvement plan. Initial results are

encouraging, but will need to be consolidated in 2010. Following the formal notice served on 13 November 2008 regarding the explosion risk, the Lyon division carried out an inspection on 20 February 2009 to check the site's conformity with the regulations applicable to management of the explosion risk. As a result of this inspection, ASN considered that the requirements specified in its formal notice had been met.

An incident of level 2 on the INES scale occurred on reactor 4 in the night of 1 to 2 December 2009. This incident was related to the loss of cooling of some reactor systems by water from the Rhone river. This event was due to the large-scale arrival of plant debris carried by the Rhone. ASN notes that EDF handled this incident appropriately and was able to restore normal reactor operation in a few hours. Finally, with respect to environmental protection, ASN in 2009 observed a degree of fragility in the plant's compliance with the requirements applicable to installations involving environmental stakes.

Tricastin nuclear power plant

From May to August 2009, the ASN Lyon division monitored the third ten-yearly outage of reactor 1, which was the first reactor in France to undergo such an outage. The ASN Lyon division in particular took part in the post-maintenance qualification testing of the nuclear steam supply system on 19 June 2009. After examining the results of the checks and the work carried out during the outage, ASN approved restart of Tricastin NPP reactor 1 on 20 August 2009 and will issue a position statement in 2010 regarding continued operation of this reactor. On the whole, ASN notes that the site handled this ten-yearly outage correctly, and incorporated a large number of modifications designed to improve safety. The NPP notified 8 incidents rated level 1 on the INES scale in 2009 and for some of them, ASN notes that there was a lack of safety culture. For the second year in succession, a fuel assembly in reactor 2 became blocked in the vessel upper internals. This assembly was made safe and released on 18 November 2009. ASN asked the NPP to conduct in-depth investigations into the causes of this event and to implement remedial measures. Finally, with regard to environmental protection, and as requested by ASN, the NPP achieved significant progress in improving the geotechnical containment situation with regard to legacy tritium pollution.

Nuclear research facilities or facilities undergoing decommissioning, nuclear plants and units

The FBFC nuclear fuel fabrication plants in Romans-sur-Isère (26)

The rise in the number of significant events notified in 2009 did not lead ASN to reconsider the safety level of the FBFC establishment in Romans-sur-Isère, which is still considered to be satisfactory. The number of

ASN inspector in the reactor building, during the ten-yearly outage inspection of the Tricastin NPP – May 2009

containment losses has in fact fallen appreciably, even though the accounting thresholds were also lowered. ASN however expects improved management of the waste areas. An environmental survey was presented to ASN in 2009, showing cases of significant pollution within the establishment. A vigorous plan of action to clean the zones concerned has been defined.

The nuclear fuel cycle plants on the Tricastin industrial platform

AREVA NC – W and TU5 plants in Pierrelatte (26)

For 2009, ASN considers that the level of safety in the AREVA NC Pierrelatte facilities has progressed. The licensee improved its ability to identify, detect and analyse deviations, which led to a rise in the number of significant event notifications. Several significant events concerning rupture of the first containment barrier were notified, although these events have no environmental consequences. Some indicators reveal shortcomings in maintenance preparation. The site will need to pay particular attention to preparing this maintenance work.

COMURHEX –Pierrelatte fluoridation unit (26)

The safety and environmental protection results of the COMURHEX establishment in Pierrelatte were inadequate in 2009. The action plan common to all AREVA licensees on the Tricastin site, which aims to take account of the operating experience feedback from the event of 8 July 2008 in the SOCATRI establishment, did not produce the anticipated results. Several minor pollution events and a leak of 17 m^3 of chemical effluents occurred. Some of these anomalies are in part due to the rundown condition of the installations, and a new plant is in fact under construction. The others highlight a lack of operating stringency and shortcomings in the safety culture.

EURODIF - Pierrelatte enrichment plant (26)

The performance of the plant to enrich uranium by gaseous diffusion of uranium hexafluoride (UF6) operated by EURODIF Production was satisfactory in 2009 with regard to nuclear safety, radiation protection and environmental protection. From the safety viewpoint, two incidents rated level 1 on the INES international scale should be mentioned. The first concerned a store of fissile material drums which did not comply with BNI safety requirements and led ASN to ask the licensee to implement a remedial action plan. The Lyon division checked that a suitable situation had been restored by means of a specific inspection. The second involved over-filling of a UF6 tank in the plant. This anomaly, which was rapidly corrected, is currently being analysed. With regard to the environment, EURODIF in 2009 examined projects to prevent any possible pollution of the Gaffière river. Finally, concerning radiation protection, the exposure levels reached in 2009 remain low.

SET – Pierrelatte enrichment plant (26)

The plant to enrich uranium by centrifugation of uranium hexafluoride (UF6) carried out initial centrifuge testing in 2009, using depleted UF6. The year was marked by the detection of failures in the inspection of piping welds which, even if they do not directly compromise safety, do require a large-scale programme of additional checks. At the same time, considerable progress was made on the construction of the North unit and the REC II facility. No significant safety event occurred in 2009.

SOCATRI – Pierrelatte plant (26)

ASN considers that the level of safety and environmental protection in the SOCATRI facilities progressed in 2009. Following the event of 8 July 2008, the licensee implemented an action plan concerning the state of its facilities, in particular the pollution prevention systems. This action plan also comprises measures to improve operating stringency and the safety culture. In 2009, the events or anomalies which occurred on the site proved to have no environmental consequences.

ASN inspection of the Tricastin NPP during the 3rd ten-yearly outage inspection – May 2009

Laue-Langevin Institute (ILL) high flux reactor

From 2003 to 2007, the ILL reactor underwent major safety upgrades, including with regard to seismic resistance. These upgrades were a pre-requisite for continued operation of the reactor in a relatively urbanised environment. ASN considers that the level of safety at the ILL is now satisfactory. The licensee strengthened the teams in charge of reactor safety and they are sufficiently familiar with the safety issues. Anomalies and events are analysed and compared with operating experience feedback. Finally, in 2009, a powerful computer tool was installed to issue maintenance authorisations and improve the monitoring of equipment tagging status.

The SUPERPHÉNIX reactor at Creys-Malville

The 2009 annual safety review of the Creys-Malville site is positive. The year was marked by the commissioning of the large components cutting unit, authorised by ASN in February 2009. The four secondary side pumps were cut up during the course of the year in this unit. Similarly, the qualification tests for the sodium processing facility led to the transformation of the first drop of sodium into soda. For both of these units, licenses were issued by ASN, which monitored correct commissioning during specific inspections. Finally, the general monitoring and maintenance rules were also modified in compliance with ASN's requests.

The IONISOS irradiation facility in Dagneux

In 2009, nuclear safety, radiation protection and environmental protection on the Dagneux site were satisfactory. In 2009, the IONISOS company made a major modification to its irradiation facility, concerning automatic loading of the conveyor transporting the items to be irradiated, requiring examination and licensing by ASN. Since then, the facility has been in operation with no events requiring notification.

The SICN nuclear fuel fabrication plant at Veurey-Voroize

The SICN site at Veurey-Voroize continued its clean-out of the buildings in order to obtain delicensing. The ASN inspections brought to light a number of decontamination problems, including in the underground galleries. Several events affecting the availability of the ventilation systems occurred in 2009. As the worksites had been evacuated, these malfunctions had no consequences.

The CEA centre reactors and plants in Grenoble

Decommissioning of the CEA nuclear facilities in Grenoble made significant progress in 2009, including the MÉLUSINE reactor, on which work has been completed,

and the Siloé reactor, on which work will end in 2010. CEA Grenoble notified 5 incidents in 2009, all with no consequences for the environment or the public. The analysis of these incidents and the conclusions of the 6 inspections conducted on the site by the Lyon division tend to show that CEA Grenoble is a rigorous licensee. ASN nonetheless remains vigilant with respect to the CEA's management of safety on the facilities, owing to its extensive use of subcontracting.

1 | 2 Assessment of radiation protection in the medical field

Radiotherapy

On the whole, ASN's assessment of radiation protection in the medical field is satisfactory. As in 2007 and 2008, the ASN Lyon division inspected all radiotherapy centres in the Rhône-Alpes and Auvergne regions. This inspection campaign was an opportunity to review physician, radiological physicist and technician staffing trends. It was also an opportunity to look at the notification and management of significant events by the operating experience feedback committees in the plants, and the various checks carried out when planning and carrying out event processing.

This campaign revealed that the vast majority of the centres are well organised enough to be able to detect and analyse undesirable events, in order to prevent them happening again. However, the radiological physicist staffing levels are still inadequate nationwide, which leads to highly fluctuating situations at the local level. This is why ASN suspended the operations of the radiotherapy department in Roanne hospital in February 2009, following the departure of the two radiological physicists. It authorised reopening of the department in August 2009, after these two individuals had been replaced by the hospital.

Interventional radiology

With regard to interventional radiology, the establishments concerned on the whole comply with the worker radiation protection regulations, often calling on the services of an external person with competence for radiation protection (PCR).

With regard to radiation protection of patients, the Lyon division is slightly more circumspect. Although the paramedical teams are on the whole well trained, considerable differences between the medical teams were observed. Good practices are on the whole well understood and applied, but only a few establishments carry out optimisation of the doses delivered.

1 | 3 Assessment of radiation protection in the industrial and research sectors

The Lyon division's assessment of nuclear safety and radiation protection in the industrial and research sectors is on the whole satisfactory. The inspections carried out in 2009 by the Lyon division brought to light no significant regulatory non-conformities, even if there is still room for improvement in radiation protection of workers.

1 | 4 Assessment of radioactive material transport

The ASN assessment of nuclear safety and radiation protection in the transport of radioactive materials is on the whole satisfactory. In the field of radioactive materials transport, which concerns several tens of thousands of packages per year in the Rhône-Alpes and Auvergne regions, 9 inspections were carried out in 2009. The consignors of fluorine 18, used in nuclear medicine, were in particular targeted, although no worrying anomalies were brought to light. Finally, the ASN Lyon division conducted a survey of more than 1000 parties concerned by the transport of radioactive materials. The conclusions of this survey led to an information day being organised on 4 February 2010, covering the safety requirements applicable to the transport of radioactive materials.

1 | 5 International action by the Lyon division

In 2009, inspectors from the ASN Lyon division undertook a mission to China. They were able to discuss nuclear reactor incidents with their Chinese counterparts, and took part in a cross-inspection of an irradiation facility belonging to the JPY Ion-Tech company.

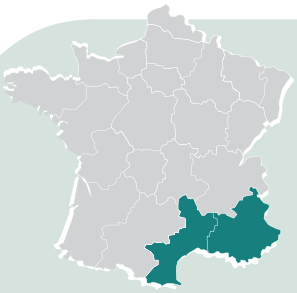
1 | 6 Other significant events in Rhône-Alpes

Two CLI were set up in 2009, one for the high flux reactor at the ILL in Grenoble, the other for the facilities currently being decommissioned at the CEA nuclear centre in Grenoble.

The FBFC plant's consultation body at Romans-sur-Isère was replaced by an ordinary CLI.

In 2009, the Lyon division held a press conference on the state of nuclear safety and radiation protection.

MARSEILLE



7 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE PROVENCE-ALPES-CÔTE-D'AZUR, LANGUEDOC-ROUSSILLON AND CORSE REGIONS REGULATED BY THE MARSEILLE DIVISION

The Marseille division is responsible for regulating nuclear safety and radiation protection in the 13 *départements* of the Provence-Alpes-Côte d'Azur, Languedoc-Roussillon and Corse regions.
As at 31 December 2009, the workforce of the Marseille division stands at 21 officers: 1 regional head, 2 deputies, 14 inspectors and 4 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Provence-Alpes-Côte d'Azur and Languedoc-Roussillon regions by the Marseille division comprise:
– Basic nuclear installations (BNIs);
  • the CEA centre at Cadarache (Bouches du Rhone *département*) with 21 BNIs and the international construction project for the ITER facility dedicated to fusion research;
  • the CEA centre at Marcoule (Gard *département*) with two BNIs: ATALANTE and PHÉNIX, for which final shutdown prior to decommissioning is scheduled for late January 2010;
  • the MÉLOX (AREVA) facility and the CENTRACO (Socodei, EDF group) facility, next to CEA's Marcoule centre;
  • the GAMMASTER irradiation facility in Marseille;
  • certain ponds of the COMURHEX Malvési facility (Aude *département*).
– Small-scale nuclear facilities, sources and equipment
  • 22 external radiotherapy departments; 8 brachytherapy departments; 26 nuclear medicine departments; 44 interventional radiology departments and 55 establishments with mobile interventional radiology devices; 105 medical imaging departments (142 tomography devices); 4,011 medical radiodiagnostic devices (including 420 mammographs); 5 blood product irradiators; 899 licenses for industrial and research equipment or sources (including 437 lead detection devices).

In 2009, the Marseille division carried out 80 inspections in the medical field, 39 in the industrial and research-related field and 3 in the other fields (external contractor, polluted sites and soil, enhanced natural radioactivity). 95 inspections were also carried out by ASN in the field of nuclear safety, 118 concerning small-scale nuclear facilities and 8 audits or checks on approved organisations, in the three regions of Languedoc Roussillon, Provence-Alpes-Côte d'Azur and Corse.

The division investigated two INES level 2 incidents in 2009, one on the MÉLOX facility operated by AREVA, the other on the Plutonium Technology Facility (ATPu) operated by CEA.

1 | 1 Assessment of basic nuclear installation nuclear safety

Cadarache site (CEA)
ASN observes progress in the organisation and management of safety at the centre, even if the interface with some of the industrial operators, including AREVA NC, could be improved; the incident involving under-estimation of the retention of fissile material in the ATPu, notified by CEA on 6 October 2009, was rated level 2 on the INES scale by ASN. The licensee will have to learn the relevant lessons from this incident. ASN also asked that an operating experience feedback system be set up in all nuclear facilities using a similar process to that of ATPu. Following the notification of 6 October, ASN took the precautionary measure of temporarily suspending activities involving fissile material within the facility. Finally, ASN issued an official report on the delay in notification of this incident, which was discovered by the licensee in June 2009. By 1 January 2010, operations had only partially resumed.

ASN is remaining vigilant with regard to CEA's organisation of its civil engineering operations for the construction of the new nuclear facilities called MAGENTA, AGATE and RJH (Jules Horowitz reactor) as well as for the renovation of existing facilities. An in-depth inspection lasting several days was carried out on the Cadarache site from 12 to 15 May 2009 with the participation of ten ASN inspectors, two inspectors from ASND and seven experts from IRSN. After this inspection, ASN and ASND found the teams involved to be motivated and responsible. Nonetheless, the effectiveness of the in-house checks carried out by CEA, with regard to both its lead contractor role and its subcontractors, must be rapidly improved.

Upgrading of the older CEA Cadarache facilities with regard to the seismic risk remains a priority for ASN. ASN ensures that the licensee complies with its undertakings to renovate its older facilities and that the design of the new facilities is appropriate. The requirements defined for management of a seismic event by the centre require particular efforts on the part of the licensee.

ASN observes an improvement in the formal definition of safety requirements for the subcontractors. However, operational monitoring of these subcontractors must be

improved, as indicated by certain incidents that occurred in 2008 and in 2009. Furthermore, subcontracting of certain tasks does not mean subcontracting of responsibilities and CEA must remain sufficiently in control of the operations it subcontracts. CEA shows satisfactory responsiveness in an emergency situation and this response organisation was again tested in June 2009 on the occasion of a national emergency exercise.

The Marcoule site (CEA)

Safety organisation and management were improved by CEA following the contrasting findings of an ASN inspection in 2008. These measures brought about a number of significant improvements, which will have to continue in 2009. ASN noted a number of improvements in the licensee's emergency response organisation, on the occasion of an inspection carried out in the second half of 2009. The safety conditions of the end-of-life period of the PHÉNIX facility are satisfactory. Electricity production stopped on 6 March 2009. ASN paid particularly close attention to the last scientific experiments in the reactor during the second half of 2009, before it was completely shut down.

After detecting a series of early warning signs in 2008 indicative of shortcomings in prevention of the safety-criticality risk in the MÉLOX facility (AREVA), ASN rated an incident involving this risk at level 2 on the INES scale in March 2009. The occurrence of other incidents related to prevention of the safety-criticality risk[1] in 2009 led ASN to summon the establishment director on 20 January 2010 to remind him of ASN's requirements and to give the licensee an opportunity to present the action plan it intends to implement in order to improve the situation.

Faced with the safety culture failings in the CENTRACO facility operated by SOCODEI (EDF group), the ASN Director-General asked the licensee to define and implement measures to improve operating safety. The checks carried out by ASN in 2009 show that the remedial measures taken by the licensee are beginning to have an effect in the field. The new arrangements put into place show that the licensee is truly committed to remedying the difficulties encountered, but ASN will need to ensure that the strategy employed will enable this progress to be maintained over the long term.

The ITER project

Together with its technical expert, IRSN, ASN began to review the creation authorisation application for the ITER installation, submitted on 31 January 2008. ASN informed the ITER Organization that several technical points in the dossier would need to be supplemented before starting the public inquiry procedure.

ASN inspection of construction of the MAGENTA BNI in Cadarache – April 2008

The COMURHEX Malvési facility

On 22 December 2009, the ASN Commission took a decision stating that the COMURHEX company must submit a BNI creation authorisation application before 31 December 2010, covering the B1 and B2 treatment and storage ponds. Without waiting for submission of this application, ASN is already responsible for regulating and inspecting them. The Marseille division already carried out a radiation protection inspection on the COMURHEX site in 2009 and has scheduled two inspections of the B1 and B2 ponds in 2010, including one concerning environmental monitoring.

1 | 2 Assessment of radiation protection in the medical field

Inspections conducted in the radiotherapy centres

In 2009, ASN inspections confirmed the nationwide shortage of medical radiation physicists (PSRPM). As a result of this shortage, ASN in February 2009 suspended the licence of the Gap radiotherapy centre, whose single PSRPM had resigned. The suspension was lifted in July 2009 after an inspection revealed that the conditions were once more in place to ensure safe treatment in compliance with the requirements of Article 6 of the order of 19 November 2004 which requires the presence of a radiation physicist while a dose of radiation is being delivered to the patients.

1. A criticality accident occurs when a chain reaction is initiated owing to an excessive mass of fissile material being brought together in one place. ASN sets safety requirements for controlling the mass of material in nuclear installations at any one time

ASN observes significant and rapid progress in the centres in the PACA region and in Corse concerning implementation of the quality assurance approach. This approach is also being implemented in the Languedoc-Roussillon region, but is experiencing more difficulty there.

In 2009, the Marseille division carried out a specific awareness raising programme for the radiotherapy departments in the PACA, Languedoc-Roussillon and Corse regions, concerning incident notification. ASN notes the gradual implementation of this system, in conjunction with operating experience feedback, which is beginning to prove its effectiveness.

1 | 3 Assessment of radiation protection in the industrial and research sectors

Research laboratories
The administrative situation of the Nice faculties was corrected, following the regulatory breaches observed in 2008. ASN noted significant progress in radioactive source management in the Montpellier universities. ASN however found negligence in the administrative management of radioactive sources at Perpignan university which, having failed to respond to ASN's requests in good time, is required to implement remedial measures without delay. ASN has planned a number of checks at Perpignan university to verify its compliance. The same lack of rigour was found at the university of Aix-Marseille II, which also stored its legacy waste in an unauthorised location without the necessary security conditions being met. ASN asked for a rapid regularisation of the situation and in 2009 checked that the remedial measures had been taken.

Industrial radiology remains a high priority for the Marseille division, with unannounced night-time inspections on the work sites being continued in 2009.

ASN is increasing its monitoring of companies using processes which could concentrate natural ionising radiations. The Marseille division thus carried out an inspection of the TEMBEC facility in Tarascon, where the industrial process concentrates the natural ionising radiation contained in wood. ASN ensures that any preventive measures necessary for the workers are taken.

ASN is continuing to ensure that sites polluted by radioactive materials, such as Bandol, Ganagobie and Marseille, have been identified and are secure.

1 | 4 International action by the Marseille division

In 2009, the Marseille division welcomed two inspectors from Ivory Coast and Gabon for a two-week immersion course. An inspector also gave a conference on monitoring radiation protection in nuclear facilities during a seminar held in Austria by the Swiss-German and Austrian radiation protection societies. Finally, an inspector from the division took part in the IRRS mission organised by IAEA in Vietnam in September 2009, in his capacity as expert.

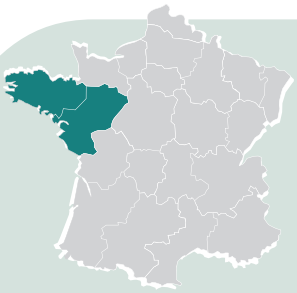
1 | 5 The other significant events in Provence-Alpes-Côte d'Azur, Languedoc-Roussillon and Corse

Public information actions in 2009
The Marseille division played an active role in commemorating the Provence earthquake and presented how the seismic risk is handled within the nuclear facilities (Provence 2009 scientific symposium, Envirorisk 2009 symposium, Sismotour exhibition, co-production of a film for professionals and drafting of a number of articles). A public information day about how the seismic risk is dealt with in the design and operation of nuclear installations in the south of France was also organised by ASN on 4 February 2010 in Marseille.

In 2009, the Marseille division organised two regional radiotherapy safety events in Marseille and Montpellier, bringing together radiotherapists, radiation physicists and radiotherapy department technicians from the south of France.

In 2009, the Marseille division held 3 press conferences on the state of nuclear safety and radiation protection.

NANTES



8 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE PAYS DE LOIRE AND BRETAGNE REGIONS REGULATED BY THE NANTES DIVISION

The Nantes division is responsible for regulating nuclear safety and radiation protection in the 9 *départements* of the Pays de Loire and Bretagne regions.
As at 31 December 2009, the workforce of the Nantes division stands at 11 officers: 1 regional head, 1 deputy, 7 inspectors and 2 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in Pays de Loire and Bretagne by the Nantes division comprise:
– three basic nuclear installations (BNIs) in the Pays de Loire region: the Monts d'Arrée[5] NPP, the IONISOS irradiation facility at Sablé sur Sarthe and the IONISOS irradiation facility at Pouzauges;
– medical departments in the Pays de Loire and Bretagne regions: 15 radiotherapy centres, 9 brachytherapy departments, 18 nuclear medicine departments, 70 interventional radiology departments, 92 tomography devices, about 5,000 medical and dental radiology devices;
– industrial and research uses in the Pays de Loire and Bretagne regions: 29 industrial radiology companies, including 8 gamma radiography contractors, about 750 licences for industrial and research equipment, including more than 300 users of devices to detect lead in paint and containing a radioactive source;
– 10 head offices of organisations approved for radiation protection technical checks (2) and for radon monitoring (8).

In 2009, the Nantes division carried out 161 inspections, including 16 inspections in BNIs (4) and the transport sector (12).

No incident higher than level 1 was notified in the Pays de Loire and Bretagne regions.

1|1 The Nantes division's assessment of BNI nuclear safety

The IONISOS nuclear facilities in Sablé sur Sarthe and Pouzauges

Inside bunkers, the IONISOS irradiation facilities use the gamma radiation from high-level Cobalt 60 radioactive sources for two applications: sterilisation of products and treatment of plastics to improve their mechanical properties. These irradiation facilities discharge no radioactive effluents into the environment and have no radiological impact in normal operation, for either the workers or the environment.

A significant event related to inadvertent opening of the bunker access door on the Pouzauges site was notified in 2009. This event was mentioned at the Pouzauges CLI meeting of 14 September 2009. Owing to the potential consequences of worker exposure to ionising radiations and the licensee's lack of safety culture, the rating of this incident, which had no consequences for either the personnel or the environment, was changed to level 1 on the INES scale by ASN in early 2010. ASN asked the licensee to immediately reinforce its irradiation unit access conditions. ASN also asked the licensee to conduct an in-depth review of the facility's safety assessment, in order to prevent such an event happening again.

1|2 Assessment of radiation protection in the medical field

Of the small-scale nuclear facility inspections, 70 were in the medical field, including 16 carried out during inspection campaigns on dentists and radiologists. These inspection campaigns revealed progress in professional awareness of worker and patient radiation protection. However, shortcomings were still evident in notification of equipment, periodic radiation protection checks, the appointment or training of persons with competence for radiation protection and in the justification of certain radiological procedures.

In external radiotherapy: the 15 radiotherapy centres were inspected in 2009 for the third year in succession. The Nantes division observed an increase in the numbers of radiological physicists in both regions (+5 in 2008, +3 in 2009). It also noted significant and rapid progress in quality management, in the detection and processing of radiation protection events and in technical equipment designed to increase treatment safety (in vivo dosimetry, repositioning imagery, double-calculation software). 60%

1. The Monts d'Arrée site (Brennilis plant currently being decommissioned) is regulated by the ASN Caen division.

ASN inspection of a cement works in Mayenne *département* – April 2009

of the centres have already initiated a risk analysis of their organisation and practices. The Nantes division notes that the centres that are most advanced in the field of quality management employ a quality specialist.

In interventional radiology: 8 establishments were inspected in 2009. The inspections concerned all the interventional procedures carried out, including coronarography, angiography/angioplasty, the use of image intensifiers in the operating theatre and the fitting of cardiac stimulators. ASN notes that progress is required in quantifying and monitoring the doses received by health professionals at the extremities (hands) and eyes and in improving the radiation protection training of workers in the operating theatre (surgeons, nurses, etc.). With regard to radiation protection of patients, efforts must also be made in terms of information about the doses delivered in the medical procedure reports.

1|3 Assessment of radiation protection in the industrial and research sectors

75 inspections were carried out in the small-scale nuclear facilities sector, 10 of which were part of the inspection campaigns on possession of devices detecting lead in paint. These inspection campaigns revealed progress in professional awareness of worker radiation protection. However, there were still shortcomings in compliance with administrative procedures, in assimilation of the observations made during the annual radiation protection inspection and in the appointment or training of persons with competence for radiation protection.

In industrial radiography: 16 inspections were carried out in 2009, which meant that all the gamma radiography professionals had been covered over a three-year period. ASN notes the satisfactory design of the fixed radiography installations, the improved procedures and the periodic performance of radiation protection technical checks. However, progress is still needed in dosimetric forecasting, optimisation of dosimetric exposure on gamma radiography worksites and compliance with signage on these worksites. In 2010, the Nantes division will be maintaining its checks on gamma radiography worksites and, together with the DRTEFP and the professionals in the sector, it will produce a regional charter of industrial radiography.

In research: 41 inspections have been carried out in this field during the past 4 years, covering 60% of the public research sector. ASN observes strong commitment on the part of the persons with competence for radiation protection, with a move towards techniques involving smaller doses for the staff. The periodic radiation protection technical checks are correctly performed. However, progress is required with regard to regularisation of the administrative situations (licences either expired or not updated), the justification of the radiological zoning adopted, the completeness of the workstation studies, the traceability of internal checks and the management of unsealed sources.

1|4 International action by the Nantes division

At an international level, the Nantes division took part in training, organised by IAEA in Morocco in October 2009, of about thirty African and Haitian managers in the regulations applicable to radioactive source licensing and inspection.

1|5 The other significant events in Pays de Loire and Bretagne

Pursuant to the TSN Act, the *Conseils généraux* of the Sarthe and Vendée *départements* created a CLI for each of the IONISOS sites at Sablé sur Sarthe and Pouzauges. The Nantes division took part in the first meetings of these committees on 8 June 2009 in Sablé sur Sarthe and 14 September 2009 in Pouzauges.

Information and awareness raising of the professionals
During training in radiation protection of patients and training of persons with competence for radiation

ASN inspection of a former mining site in Rosglas (Morbihan *département*) – January 2009

protection, the Nantes division intervened with a large number of professionals such as veterinary surgeons, cardiologists, radiologists and dentists.

Together with the Pays de Loire DRTEFP, it also organised a regional seminar on the topic of industrial radiography, which attracted about 80 professionals from the two regions. Following this seminar, the stakeholders began work on producing a regional charter of industrial radiography.

The former uranium mines

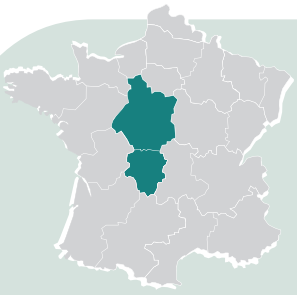
The Nantes division carried out 5 inspections on the former mining sites in the Bretagne and Pays de Loire regions. Jointly with the Pays de Loire DREAL, it also carried out an unannounced sampling campaign around the Écarpière (Loire-Atlantique *département*) and La Commanderie (Vendée *département*) sites. The results of these checks will be available during the course of 2010.

The Nantes division also took an active part in the information and discussion meetings organised by the offices of the préfets of the Loire-Atlantique and Vendée *départements* on the subject of the former uranium mines.

The ASN Bordeaux and Nantes divisions carried out a radon measurements campaign in houses built on backfill (mining waste) from the former uranium mines operated by COGEMA in the North of the Deux-Sèvres *département* (79). The results of these checks will be available during the course of 2010.

In 2009, the Nantes division held 1 press conference on the state of nuclear safety and radiation protection.

ORLÉANS



9 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE CENTRE, LIMOUSIN AND ILE-DE-FRANCE REGIONS REGULATED BY THE ORLÉANS DIVISION

The ASN Orleans division is responsible for regulating nuclear safety and radiation protection in the 9 *départements* of the Centre and Limousin regions. The Orleans division is also at the disposal of the Paris regional representative, under whose authority it regulates the safety of the BNIs of the Ile-de-France[1] region.
As at 31 December 2009, the workforce of the ASN Orleans division stands at 27 officers: 1 regional head, 3 deputies, 18 inspectors and 5 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in the Centre, Ile-de-France and Limousin regions by the Orleans division comprise:
– the Belleville-sur-Loire NPP (2 reactors of 1,300 MWe);
– the Dampierre-en-Burly NPP (4 reactors of 900 MWe);
– the Saint-Laurent-des-Eaux site: the NPP (2 reactors of 900 MWe) in operation, as well as the 2 French gas-cooled reactors (GCR) undergoing decommissioning and the irradiated graphite sleeves storage silos;
– the Chinon site: the NPP (4 reactors of 900 MWe) in operation, the 3 French gas-cooled reactors undergoing decommissioning, the irradiated material facility (AMI) and the inter-regional fuel warehouse (MIR);
– the 8 BNIs in the CEA Saclay centre, including the OSIRIS, ISIS and ORPHÉE experimental reactors;
– the CIS bio international plant in Saclay;
– the 2 BNIs undergoing decommissioning in CEA's Fontenay-aux-Roses centre;
– the electromagnetic radiation laboratory in Orsay, undergoing decommissioning (LURE);
– the medical departments in the Centre and Limousin regions using ionising radiations: 12 radiotherapy centres, 4 brachytherapy departments, 12 nuclear medicine departments, 30 interventional radiology departments, 56 tomography devices, about 3,000 medical and dental radiology devices;
– the industrial and research uses of ionising radiations in the Centre and Limousin regions: 30 industrial radiology companies, including 5 gamma radiography contractors, about 400 licences for industrial and research equipment.

In 2009, the ASN Orleans division carried out 213 nuclear safety and radiation protection inspections: 100 inspections of the nuclear installations on EDF's Belleville, Chinon, Dampierre and St-Laurent NPPs, 40 inspections on the nuclear sites in the Ile-de-France region (CEA Saclay and Fontenay centres, CIS bio on the Saclay centre, CNRS Orsay), 73 inspections on small-scale nuclear facilities in the Centre and Limousin regions.

No incident of level higher than 1 on the INES scale or the ASN-SFRO scale was notified to the division in 2009.

1 | 1 Assessment of BNI nuclear safety

Belleville-sur-Loire NPP

In 2009, ASN observed a significant improvement in the safety performance of the Belleville-sur-Loire site, including with regard to operation of the installations. However, the numerous maintenance anomalies identified at restart of reactor 2, following its ten-yearly outage, show that progress is till needed in operating stringency. In 2009, the site continued with the measures it had started in 2008, including preparation for radiographic inspections.

Finally, with regard to environmental protection, ASN considers that the performance of the Belleville-sur-Loire site is down and identified numerous anomalies in the prevention of incidents liable to have an environmental impact and in the action to be taken if they do occur. In these conditions, ASN considers that the site needs to take strong, proactive measures in 2010 to improve its handling of environmental issues.

Chinon nuclear power plant

ASN considers that Chinon's nuclear safety performance is down on 2008. The number of significant operating events had significantly risen, mainly owing to the numerous deviations from strict compliance with the general operating rules. This development highlights a lack of a questioning attitude on the part of the operating crews, combined with deficiencies in training.

With regard to environmental protection, ASN considers that the plant's compliance with the regulations is satisfactory but that progress is needed in compliance with the requirements applicable to installations liable to have an impact on the environment, as numerous deviations from the regulations in this field were identified during inspections.

Dampierre-en-Burly nuclear power plant

ASN considers that the Dampierre-en-Burly site's performance is on the whole in line with ASN's general assessment

1. Radiation protection in the Ile-de-France region is regulated by the Paris division.

Inspectors from the ASN Orleans division accompanied by German inspectors in front of the OSIRIS reactor in the CEA Saclay centre – May 2008

of EDF. ASN nonetheless considers that the plant's safety results worsened in 2009. The repeated loss of tightness of the fuel rod cladding and the recurring failures observed by ASN in monitoring of the plant maintenance contractors, are an illustration of this trend.

In the field of occupational safety, including worker radiation protection, there were repeated breaches of the regulations on the worksites inspected, meaning that the site must review its practices. However, management of radioactive discharges into the environment is once again highly satisfactory this year.

Saint-Laurent-des-Eaux nuclear power plant

ASN considers that the Saint-Laurent-des-Eaux site's performance is on the whole in line with ASN's general assessment of EDF. In terms of safety, 2009 was marked at the Saint-Laurent-des-Eaux NPP by a large number of significant events indicating a lack of rigorousness in monitoring from the control room, or breakdowns in communication within the operating crews. However, the Orleans division notes the efforts made on the lockout/tagout process, for which the number of anomalies had significantly fallen.

In the field of radiation protection, the site's results present a contrasting picture. The radiological cleanness indicators are indeed satisfactory and in fact improving, but ASN observed too many working situations in which there was a blatant lack of radiation protection culture on the part of the persons involved. With regard to the environment, the Saint-Laurent-des-Eaux site is maintaining its efforts to optimise its radioactive discharges.

CEA's Saclay centre

L'ASN considers that the level of safety in the CEA nuclear facilities in Saclay centre is on the whole satisfactory. The stringency of operation of the experimental reactors is particularly good. The emergency exercise on 17 September 2009 demonstrated the licensee's ability to manage a radiological emergency. With regard to risk prevention, ASN is also closely monitoring the control of urban development around the Saclay site, with the two-fold aim of complying with the national framework currently being defined jointly with the ministry responsible for the environment and to inform the local authorities of the risk inherent in the nuclear facilities.

ASN considers that including specific safety criteria in the contracts such as those covering operation of the STELLA effluent treatment facility helps improve contractor supervision and incorporates operating experience feedback from the incident in which a worker entered a prohibited area of a centre BNI at the end of 2007. However, control over subcontracting will continue to require particularly close attention by CEA as a result of the anomalies that occurred in 2009 involving contractors, including for the installations undergoing decommissioning. Moreover, although many steps have been taken to improve follow-up of inspections, performance of periodic tests and maintenance, ASN considers that these efforts need to be consolidated.

ASN also notes that the significant events that occurred in the centre in 2009 reveal recurring problems with the iodine trap systems, as well as deficiencies in the monitoring of older equipment. Long-term solutions will need to be provided to prevent these types of anomalies from happening again.

The CIS bio international plant in Saclay

Although the renovation work in progress is designed to improve the safety of the plant, the weaknesses observed in plant operation and the delays in producing the safety analysis files, in particular the complete periodic safety review file, required sustained monitoring by ASN in 2009.

This monitoring highlighted the need for the licensee to enhance its safety management by means of more structured and hierarchical action in this field and by ensuring the permanent presence of staff with the appropriate skills. Against this backdrop, the ASN Commission's hearing on 18 June 2009 of the representatives of CIS bio international as a result of its new status as nuclear licensee, was followed by decision 2009-DC-0145 of 16 July 2009 requesting transmission of a dossier on installation safety

management and on the resources dedicated to nuclear safety and radiation protection. This dossier, submitted at the end of 2009, is currently being reviewed by ASN.

CEA's Fontenay-aux-Roses Centre

ASN considers that for the centre's management, nuclear safety and radiation protection are major concerns. 2009 was nonetheless marked by a number of anomalies concerning the dynamic containment of radioactive materials. Control over the maintenance of the equipment performing this function and compliance with the safety requirements must therefore be improved. However, ASN considers that control over the BNI clean-out activities is satisfactory in terms of performance, management and monitoring. Finally, ASN insists on the fact that overall control over the time-line inherent in the decommissioning programme must be guaranteed, despite the unforeseen events that are inevitable in the waste disposal routes and in the availability of transport containers.

1 | 2 Assessment of radiation protection in the medical field

In 2009, ASN considers that the radiotherapy centres in the Centre and Limousin regions on the whole progressed since the inspection campaign carried out in 2008. Most of the centres have initiated programmes to achieve progress in treatment safety, including through more formalised practices, implementation of a quality management system, recording of incidents and malfunctions and regulation and inspection of equipment. However, a number of radiotherapy centres in the Centre and Limousin regions suffered a shortage of medical radiological physicists, but also radiotherapy practitioners. ASN considers that these problems often constituted an obstacle to the progress under way. In 2009, ASN temporarily suspended the licence of the Blois (Loir-et-Cher *département*) radiotherapy centre, preventing it from admitting new patients, owing to the fact that its single radiological physicist had left without being replaced.

In the nuclear medicine field, ASN considers that the facilities are on average well maintained, even though few departments manage to maintain their ventilation systems in strict compliance with the conditions set out in the regulations. Moreover, ASN observes considerable delay in precise zoning of the facilities and in the majority of cases, most of the department is included in an area traditionally zoned as a controlled work area. Finally, ASN believes that the management of contaminated waste and effluents could be improved and in 2009, several significant events involving repeated tripping of radioactivity detection gates in household waste incineration plants were notified.

Finally, in 2009, the Orleans division produced an inventory of how the interventional radiology establishments in the Centre and Limousin handle radiation protection. ASN considers that the departments need to make progress in formal management procedures for the radiological risk, with incorporation of this technique into the organisation of medical physics and the production of workstation analyses.

1 | 3 Assessment of radiation protection in the industrial and research sectors

There is a contrasting picture of gamma radiography and X-ray radiography carried out in the Centre and Limousin regions on behalf of large customers in the armaments industry and in NPPs. ASN considers that the intervention conditions on the non-destructive testing contractor worksites are constantly improving, as is the way they manage radiation protection when using their equipment.

However, ASN feels that preparation of the work needs to be improved, as it is often constrained by the tight deadlines between the order and the performance of the work, in terms of both radiation protection (dose forecasting, definition of operating areas) and overall risk prevention (prevention plan). The shortcomings observed could prejudice rigorous optimisation of the exposure to ionising radiations of the workers concerned.

1 | 4 International action by the Orleans division

Since 2002, the Orleans division and the department responsible for regulating safety at the Ministry for the Environment in the German State of Lower Saxony have discussed their respective practices and carry out cross-inspections and visits. In 2009, three inspectors from the Orleans division carried out a visit to the Grohnde NPP in Germany. This was an opportunity to discuss the organisation and procedures involved in regulating and inspecting NPPs in each country, including the position of the technical support provided to the regulators, by TÜV in Germany and IRSN in France.

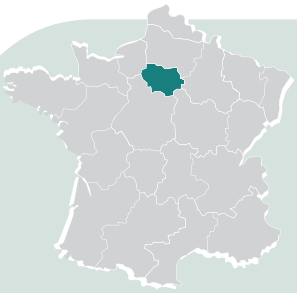
1 | 5 Other significant events in the Centre and Limousin regions

Monitoring of former uranium mines in the Limousin region

ASN considers that the move to improve knowledge of the environmental and health impacts of the former Limousin mining sites must be continued. When mining waste is used outside the perimeter of the mining sites, ASN

systematically checks the compatibility of land uses in the immediate vicinity of the areas in which it is to be used. ASN in particular recommends that the local urban development plans carry a record of the former mining sites, especially if mining waste is present. ASN will subsequently rely on the recommendations of the pluralistic experts group (GEP) for the Limousin uranium mines.

In 2009, the Orleans division held a press conference on the state of nuclear safety and radiation protection.



10 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE ILE-DE-FRANCE REGION AND OVERSEAS FRANCE *DÉPARTEMENTS* AND TERRITORIAL COMMUNITIES REGULATED BY THE **PARIS** DIVISION

The Paris division is responsible for regulating the small-scale nuclear activities in the 8 *départements* of the Ile-de-France region, in the 2 territorial communities and 4 *départements* of Overseas France.
As at 31 December 2009, the workforce of the Paris division stands at 22: 1 regional head, 2 deputies, 17 radiation protection inspectors and 2 administrative officers, under the authority of a regional representative.

The small-scale nuclear facilities to be regulated in the Ile-de-France region and in the *départements* of Overseas France represent 22% of the French total. The two particularities are the diversity and the number of facilities to be regulated:
– 35 external radiotherapy departments (89 accelerators);
– 18 brachytherapy departments;
– 65 nuclear medicine departments;
– more than 250 tomography departments;
– about 4,000 medical radiodiagnostic devices;
– about 8,000 dental radiodiagnostic devices;
– 15 industrial radiology companies;
– 512 industrial research devices or sources.

The Paris division carried out 241 inspections in the field of small-scale nuclear activities. These inspections were in a variety of areas: radiotherapy, nuclear medicine, interventional radiology, radioactive material transport, monitoring of organisations approved by ASN, etc.

78 events were notified to the Paris division in 2009. 7 concerned the transport of radioactive materials and 71 concerned radiation protection of workers, patients, the public or the environment in small-scale nuclear activities. 3 incidents that occurred in radiotherapy departments were rated level 2 on the ASN/SFRO scale.

1|1 Assessment of nuclear safety and radiation protection in the medical field

In the field of external radiotherapy, the ASN Paris division carried out 42 inspections in 2009 in the Ile-de-France region and the *départements* of Overseas France.

- The 35 radiotherapy departments were all inspected for the third year in succession.
- Although significant progress was observed in measures contributing to treatment safety (analysis of anomalies, in vivo dosimetry, etc.), considerable progress is still expected in order to develop a true quality assurance approach.
- Some structures will also need to be enhanced (technical area, workforce) in particular by recruiting personnel or merging with other centres. ASN remains closely attentive and will ensure that the radiotherapy departments are sufficiently staffed with radiological physicists.
- ASN suspended the activities of the radiotherapy department in the Poissy-Saint-Germain intercommunal centre in the Yvelines *département* (78) following an inspection which revealed that a system of great importance for radiation protection of the patients (portal imaging) had not been working satisfactorily for several months. It will only be possible to resume treatment when the portal imaging systems used to check the position of the patients are functioning again.
- Three incidents rated level 2 on the ASN/SFRO scale were notified to the ASN Paris division in 2009 out of a total of 42 events.

In the field of **nuclear medicine**, the Paris division carried out 32 inspections in 2009. Following an incident and an inspection, the nuclear medicine department activity in the Sud-Francilien hospital in Corbeil-Essonnes (91) was suspended for a month, during which time the department took remedial measures to comply with the worker and environment radiation protection regulations in force.

1|2 Assessment of radiation protection in the industrial and research sectors

ASN intensified its monitoring of CEA facilities in 2009. CEA's Fontenay-aux-Roses and Saclay centres comprise BNIs and facilities using radioactive sources and electrical generators of ionising radiations. These latter facilities are being increasingly closely monitored by ASN, given the radiation protection issues associated with the use of a very large quantity of radioactive sources. Two inspections took place in 2009 to review the current situation of the facilities and their degree of conformity with the regulations.

Inspection by ASN and the competent health authority of a tomography facility in the French Polynesia hospital in Papeete – November 2009

Owing to the particularity of the equipment used and the working conditions of the radiologists on the site, ASN sees industrial radiology as an activity with significant radiation protection stakes. Ile-de-France and the *départements* of Overseas France (DOM) comprise 15 companies carrying out industrial radiology work. In 2009, 8 inspections were conducted. They revealed that the steps taken when carrying out checks on the site need to be improved. This is why 15 inspections are scheduled for 2010, including 9 night-time inspections on a construction site.

1|3 Assessment of radiation protection of the public and the environment: management of waste contaminated by radionuclides and management of polluted sites and soils

In 2009, the Paris division carried out a campaign of inspections to check implementation of the requirements of the ASN decision of 29 January 2008 setting the technical rules for the disposal of effluents and waste contaminated by radionuclides or liable to be so contaminated as a result of a nuclear activity. This campaign concerned the 32 research sites in the Ile-de-France region. These inspections revealed considerable differences between the private and public sectors, with regard to the means allocated to waste and effluent management, with the private sector devoting more resource. They also showed that there was inadequate familiarity with these regulations and that they were insufficiently implemented.

With regard to the management of polluted sites and soils, ASN is involved in informing the population and validating the proposed rehabilitation levels, to ensure the radiation protection of the public and the future users of the polluted sites. In 2009, the ASN Paris division took part in a public meeting of the stakeholders and neighbours living in the vicinity of the former Curie Institute in Arcueil (94). An inspection of this site was also carried out to check that the safety of workers and residents was guaranteed during the works phase involving sorting of the waste present on the site. The Paris division was also involved in the rehabilitation projects for the sites of the former Pierre et Marie Curie school in Nogent-sur-Marne (94) and the Charvet site on the Ile-Saint-Denis (93), in order to check that the rehabilitation targets proposed by those in charge were compatible with the planned future use. Finally, the Paris division took part in a public meeting concerning the Clos Rose area of the Federal Mogul site in Gif-sur-Yvette (91) to inform the local residents and trigger a diagnosis of the neighbouring land.

1|4 Other significant events in the Ile-de-France region and in the *départements* of Overseas France

The Paris division carried out 13 verifications to monitor organisations approved by ASN to carry out radiation protection technical checks. It rejected the application by the Techniconseil company in early 2009 for approval renewal. This company was re-approved by ASN several weeks later, during which time the company had revised and extensively modified its organisation and its inspection practices, in order to comply with the regulations in force.

In 2009, the Paris division organised two thematic seminars for professionals. A first seminar was devoted to radiotherapy and was attended by about 100 people.

ASN press conference on Reunion Island concerning radiation protection results for 2008-2009 – November 2009

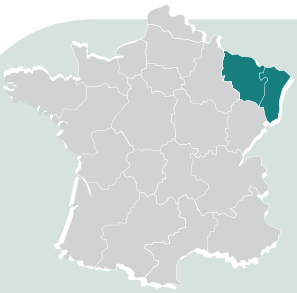
Round-tables enabled the professionals to be presented with experience feedback about methods for in-depth analysis of events, allowing the subsequent definition of corrective measures. Implementation of these measures makes for safer treatment.

A second seminar was devoted to nuclear medicine and attracted 100 participants. It highlighted the approach adopted by some departments concerning transparency and experience feedback after an incident, the optimisation approach to limit the doses delivered to the patient and finally, the installation of a specific system with significant radiation protection constraints.

In 2009, ASN signed an agreement with French Polynesia, which has responsibility for radiation protection, for provision of its medical inspection expertise. A first mission was carried out in 2009 to find out how radiation protection of patients, workers, the public and the environment was managed in French Polynesia and with a view to opening a radiotherapy department in the new hospital in Papeete.

In 2009, the Paris division held 2 press conferences on the state of nuclear safety and radiation protection: one in the Ile-de-France region and one on Reunion Island.

STRASBOURG



11 THE STATE OF NUCLEAR SAFETY AND RADIATION PROTECTION IN THE ALSACE AND LORRAINE REGIONS REGULATED BY THE STRASBOURG DIVISION

The Strasbourg division is responsible for regulating nuclear safety and radiation protection in the 6 *départements* of the Alsace and Lorraine regions.
As at 31 December 2009, the workforce of the Strasbourg division stands at 17: 1 regional head, 2 deputies, 11 inspectors and 3 administrative officers, under the authority of a regional representative.

The activities and installations to be regulated in the Alsace and Lorraine regions by the Strasbourg division comprise:
– the NPPs at Fessenheim (2 reactors of 900 MW) and Cattenom (4 reactors of 1,300 MW);
– the Strasbourg university reactor, undergoing decommissioning;
– 10 external radiotherapy departments;
– 3 brachytherapy departments;
– 13 nuclear medicine departments;
– about fifty interventional radiology departments;
– 56 tomography devices;
– 4,000 medical and dental radiodiagnostic devices;
– 200 industrial research establishments;
– 2 cyclotrons producing fluorine 18.

Speech by the Director General of the Swiss nuclear regulator alongside Olivier Gupta, ASN Deputy Director General, at the "Earthquake" international seminar in Strasbourg – June 2009

In 2009, the Strasbourg division carried out 151 inspections: 65 inspections on the NPPs of Fessenheim and Cattenom and the Strasbourg university reactor; 6 inspections concerning the transport of radioactive materials; 80 inspections of small-scale nuclear facilities.

No incident higher than level 1 on the INES scale or the ASN-SFRO scale was notified to the division in 2009.

1|1 Assessment of BNI nuclear safety

Fessenheim nuclear power plant

ASN considers that the Fessenheim plant has made progress in many areas and that its nuclear safety, environmental protection and radiation protection performance is on the whole satisfactory. In particular, with regard to operating stringency, the performance of the Fessenheim plant is back on a par with the average of the EDF plants. ASN is currently conducting an in-depth review of the state of the plant's installations during the third ten-yearly outage which began in October 2009. Following these in-depth checks, ASN will forward its opinion to the Government on whether or not to continue with operation of the Fessenheim NPP.

In addition, following the event of 27 December 2009, ASN is paying particular attention to the reliability of the NPP's feedwater supply system, because on that date, vegetal debris led to a partial reduction in the flow rate of the cooling systems, leading ASN and the licensee to trigger the emergency response. Although plant safety and human radiation protection was at no time compromised, ASN considers that the licensee must take all necessary steps to prevent such an event happening again.

Cattenom nuclear power plant

ASN considers that the nuclear safety performance of the Cattenom NPP is on the whole satisfactory and that the plant has made progress in the management of its non-radioactive discharges into the environment (coolants, legionella, etc.).

However, in 2009, ASN observed slackening in radiation protection stringency. Even if no workers were actually contaminated, ASN found a number of anomalies: signage faults, inoperative radiation protection equipment, instructions either missing or not followed, belated detection of contaminated equipment, and so on. ASN considers that the licensee must establish precise operating experience feedback in this area and take appropriate measures.

Finally, in 2009, ASN helped draft the requirements for urban development around the Cattenom plant. In just a few years, the population living within a 2 kilometre radius of the plant has risen by 10%. In addition to the existing population protection measures, measures to restrict urban development in this zone were approved by the préfet of the Moselle *département* in July 2009 and communicated to the local municipalities.

Strasbourg university reactor: ASN monitored the end of reactor decommissioning, which was completed in April 2009 and it took a number of samples from the site in July 2009 to check the final status of the installation.

1 | 2 Assessment of nuclear safety and radiation protection in the medical field

Radiotherapy: the inspections carried out by ASN in 2009 in all 10 radiotherapy centres in Alsace and Lorraine found that most of the departments had continued to improve treatment safety. The 10 departments in Alsace and Lorraine also implemented a process for notification of the significant events occurring in their installations. ASN however observes that the situation is fragile in some departments, partly owing to staffing levels.

Interventional radiology: ASN published the results of its investigations following the event notified in March 2009 by the interventional neuroradiology department at Strasbourg university hospital. ASN noted that the alopecia observed was partly due to the choice of device operating modes by the practitioners, which entailed the delivery of a very high dose for the pathologies being treated, and partly due to a failure to optimise the device settings.

ASN asked the Strasbourg university hospital to implement an action plan to optimise and manage the doses delivered. This large-scale, innovative action plan enabled the hospital to make a significant reduction in the doses delivered to the patients (from -50 to -70%) and thus become one of the establishments employing the most advanced patient radiation protection practices in France in the field of interventional radiology.

1 | 3 Assessment of nuclear safety and radiation protection in the industrial and research sectors

In 2009, ASN launched a campaign of inspections of industrial establishments which use radioactive sources to monitor their production. Following on from its actions in 2006 concerning those in possession of radioactive sources used in devices for detecting lead in paint, in 2007 concerning medical radiology practices and in 2008 concerning veterinary surgeons, ASN checked 23 industrial establishments using small radioactive sources to monitor production. These inspections brought to light no significant regulatory nonconformity.

1 | 4 Assessment of radioactive material transport operations

In 2009, ASN carried out a campaign of inspections on carriers of radioisotopes for the nuclear medicine departments and carriers of gamma radiography devices in Alsace and Lorraine. A few administrative nonconformities, which do not compromise transport security, were identified and corrected.

1 | 5 International action by the Strasbourg division

Under the bilateral exchanges with its German, Luxembourg and Swiss counterparts, the ASN Strasbourg division took part in 11 cross-inspections in NPPs and in medical and industrial establishments.

In addition, the criteria for notification of events occurring in NPPs were compared with those in Germany. This study showed that the event notification criteria differ between the two countries, which explains why the French NPPs notify an average of 11 events per year and per reactor, as compared with 6 events per year and per reactor in Germany.

Finally, on 17 June 2009, ASN organised an international seminar in Strasbourg on management of the seismic risk in nuclear installations. This seminar attracted more than 100 participants: researchers, experts, foreign nuclear regulators, environmental defence associations, journalists, etc. It enabled ASN to identify areas for work to update the seismic risk regulations.

1 | 6 Other significant events in the Alsace and Lorraine regions

On 9 June 2009, an emergency exercise simulating a radioactive materials transport accident was held in the Vosges *département*. This exercise was used to test the authorities response organisation and resources in the event of an emergency.

In 2009, the Strasbourg division held 2 press conferences on the state of nuclear safety and radiation protection.