



French Republic

PARLIAMENTARY OFFICE FOR SCIENTIFIC AND TECHNOLOGICAL  
ASSESSMENT



## Nuclear safety

### Summary of the intermediate report of the special joint parliamentary committee on nuclear safety, present and future outlook of the nuclear industry.

Chair of the special joint parliamentary committee: Mr Claude Birraux, deputy.  
Rapporteurs: Messrs. Christian Bataille, deputy, and Bruno Sido, senator.

*Following the Fukushima events, the Parliamentary Office for Scientific and Technological Assessment (OPECST) was officially asked at the end of March 2011 – jointly by the National Assembly Bureau and by the Senate Committee on the economy, sustainable development, territorial and regional planning – to carry out a study on nuclear safety, and the present and future outlook of the nuclear industry. To carry out this study, seven members of the National Assembly economic affairs and sustainable development committees were also involved, as well as eight members of the Senate Committee on the economy, sustainable development, territorial and regional planning.*

*The first part of this study, devoted to nuclear safety, was completed on 30 June 2011 by the publication of an intermediate report. This report assembles and summarises the information collected during six public hearings and seven trips to nuclear sites.*

#### Nuclear safety in France

The report emphasises the great strictness of the nuclear safety management system, which forms the heart of nuclear safety, alongside radioprotection and the physical protection of sites. According to the Act of 13 June 2006, nuclear safety is *"the set of technical provisions and organisational measures ... taken with a view to preventing accidents or limiting their effects."* It therefore concerns in particular the design of facilities and their operational organisation.

The report recalls that safety must necessarily be devised as a permanent quest for improvement. This principle fully justifies the conduct of ten-yearly visits by the Nuclear Safety Authority (ASN), which aim at periodically integrating the 'best international practices'. This principle also fully underscores the importance of the continuation of the research effort on safety, by the operators and by the Radioprotection and Nuclear Safety Institute (IRSN).

#### Strengthening university research on nuclear safety

After the Fukushima nuclear accident, it was a matter of course that the special joint parliamentary committee should above all focus, in its hearings and trips, on major hazards in French nuclear facilities.

First, the Japanese government recognised, in a report of 1 June 2011 to the International Atomic Energy Agency (IAEA), that the tsunami hazard had been underestimated. In metropolitan France, the seismic hazard is assessed as 'very low' to 'average'. In no case is it comparable to that to which Japan is exposed, where errors of appreciation were manifestly committed.

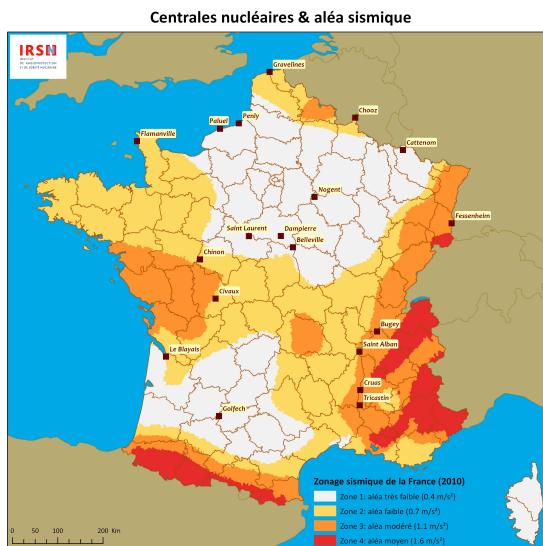
Second, the existence of major hazards has been factored in right from the design of French plants. There is no standard dimensioning: each plant is designed, in keeping with the characteristics of its site, to resist a hazard calculated on the basis of historic observations and increased to cover margins of uncertainty.

Third, progress of knowledge is a priority because it allows continuous improvement of safety, through safety re-examinations.

Research work should therefore be pursued, in three directions: obtaining a better assessment of uncertainty margins and their expression as safety margins, improving historic and paleo-historic knowledge in the field of major hazards and studying the combinations of hazards of various origins.

**The rapporteurs therefore recommend the setting up of a fund fed by nuclear operators, managed by the National Research Agency (ANR) and devoted to university research on major natural hazards, their impact on nuclear facilities and the means to cope with them, on the basis of specifications established by the ASN.**

### Nuclear power plants & seismic hazard



### Safer management of subcontracting

The rapporteurs understand that nuclear operators call on subcontractors for highly specialised or seasonal operations. Subcontracting also allows a division of work between a sponsor and an executor, which can improve the quality of performances. However, its excessive extension is giving rise to a certain number of problems.

For instance, the price criterion is prioritised by the rigidity of invitation to tender procedures imposed by European regulations. For the nuclear industry – and moreover any other sensitive

industry – the rapporteurs feel that these regulations must be improved to **place the quality criterion foremost**.

Multi-layer chain subcontracting forms another problem in which a service provider in turn calls on personnel from another company. During a visit, the rapporteurs learnt that, in some cases, such subcontracting can involve up to eight levels of subcontractors. **Deeming that the issue of multi-layer chain subcontracting is a priority matter, they ask the Government to send them before end 2011 a legal study on how it can be framed.**

In addition, outsourcing raises the issue of the traceability of the radiological monitoring of workers, especially those travelling from site to site. In this respect, the rapporteurs propose **the appointment of a primary care-correspondent for occupational medicine, at each site**, tasked with checking health files. Last, the rapporteurs ask the Government **to give the ASN supervisory competence over the procedures for accrediting companies and personnel working at nuclear plants.**

### Adding a rear line to 'deep defence'

The hypothesis of even more violent and destructive shocks, especially due to extreme natural phenomena, which may occur concurrently, raises the question not only of the strengthening of nuclear plant structures, but also of the setting in place of a rear line reaction capacity, at a distance from plants.

The idea of having a very quickly mobilisable fleet of alternators and pumps is not new; the standardisation and geographical coverage of French nuclear power plants form an asset in this respect as the aim is for sites to be mutually supportive: if one is affected by a localised disaster, other unaffected sites can act as a rear base supplying backup facilities.

However, intervention by the rapid mobilisation of mobile means is not just a matter of equipment being available; it also supposes a close transporting capacity, and a connection capacity, which must be planned at the time the facilities are designed, and the necessary developments must undergo safety checks.

The rapporteurs therefore recommend that the Nuclear Safety Authority (ASN) should carry out an assessment of the ongoing strengthening of the backup water and electricity mobile arrangements.

Furthermore, the operational capacity of the rear defence line will be increased if it can make use of remote monitoring instruments. In this respect, the rapporteurs invite the IRSN and the Atomic Energy and Alternative Energies Commissariat (CEA) to jointly undertake a research project on techniques allowing remote radiological measurements and remote piloting of equipment in plants located in inaccessible sites.

### Consolidating public control over the monitoring of safety

The rapporteurs consider that the French nuclear industry must remain under direct State control. European competition rules on the energy market must not be applied, without proper judgement, to the production of nuclear electricity. This reasoning must naturally gain recognition at a time when nuclear energy concerns France more than its European environment.

During their visits to nuclear plants, the rapporteurs were able to measure the essential role played by Local Information Committees (CLIs). These are pluralistic bodies which follow up the safety of plants most closely and keep populations informed.

To allow CLIs to benefit from pluralistic expertise, the rapporteurs suggest the setting up of a fund, managed by the ANR, to meet requests for expertise from CLIs. This way, these will be able to call on university laboratories already working on these issues. The aim is in no way to challenge the IRSN whose efficacy and competence the rapporteurs underscore. But the relative weakness of alternative expertise is one of the limits of the present system.

### Improving the performance of crisis management

Regarding civil safety, the Government must reassess the contingency plans, in the light of the new knowledge and feedback after Fukushima, especially regarding the territorial

breadth of the systems, by carrying out tests of the French capacity to respond to a rising scale of difficulties.

In this respect, referring to the spontaneous reactions of the population following the untimely triggering of the warning siren at the Golfech site, the rapporteurs raise the question of whether alert practices carried out at plants are representative of an actual accident. They therefore consider that unexpected practices must be carried out, involving only the operators and public authorities, and also longer, and therefore more comprehensive, practices including post-accident management and population reception logistics.

These practices must be combined with the rollout of a genuine safety culture in the school setting and, through the media, in the general public, by strengthening previously existing structures, like the French Institute for Major Hazard Trainers (IFFORME) which intervenes in primary and secondary schools.

Last, the protection of populations in the event of a nuclear crisis also requires better control over urbanisation in the vicinity of nuclear sites, where there have been an increasing number of projects. Therefore the rapporteurs consider that the ongoing drafting at the ASN of a guide on control over urbanisation must be speeded up.

### Ensuring greater transparency regarding the costs of the sector

The Fukushima nuclear disaster will have allowed the final ditching of the idea that some once aired of selling low cost reactors to countries that have neither the necessary technical and human means nor an independent and powerful safety authority.

In the nuclear field, safety is priceless. It does however have a cost and transparency requires that this be known by citizens.

The rapporteurs ask the Government to supply the National committee assessing the funding of the costs of dismantling nuclear plants and managing radioactive wastes (CNEF) with the necessary means so that it can transmit its first assessment report before the end of this year.

Also the ASN permanently requires operators – during inspections, ten-yearly visits, safety

assessments – to bring their plants and organisation of safety up to level. **The ASN is therefore asked to draw up, in its annual activity report, a statement of all the costs borne by operators in strengthening nuclear safety.**

### **Ensuring international coherence of safety assessments**

In view of the international dimension of any nuclear accident why not establish international safety standards, compliance with which would be ensured by monitoring, which would also be international? **The rapporteurs feel that the undeniable strengthening of safety brought about by the progressive stepping up of this cooperation would nevertheless miss its goal if it were to lead to a supranational organisation taking over, in a centralised manner, responsibility for national public inspections.**

The way of dealing with the result of the safety assessments, or stress tests, of the 143 European nuclear reactors will illustrate this point. As these tests are carried out on a common objective basis, a classification of reactors by decreasing order of fragility with regard to safety objectives will become possible, and decisions will have to be taken. **The rapporteurs ask the Government**

**and the ASN to ensure a uniform degree of strictness of the safety assessments made in member countries by making sure, in particular, of the indisputable nature of the multi-annual joint inspections.**

As the totality of the nuclear plants of some member countries has been inherited from the old socialist world, which dramatically distinguished itself by the Tchernobyl accident, the Government and the ASN are therefore asked **to ensure that the conclusions drawn from the European safety assessments should be based on homogeneous bases, leading to the application of the strictest measures to the worst classified reactors in Europe.**

On the other hand, there is absolutely no doubt that a strengthening of international cooperation, in whatever form, by multiplying the number of different opinions, forms an additional asset for safety, provided safety standards set the highest level of requirement. **The rapporteurs therefore ask the Government to act in the framework of international negotiations so that the safety standards adopted at European level are taken up by the IAEA.**

### **Conclusion**

France is one of the nuclear countries where the management of safety is both the most demanding and the most transparent. In this respect, the independence of the Safety Authority is the best guarantee of strictness in the safety field and the existence of pluralistic bodies, such as the Local Information Committees, is the best guarantee of the transparency of safety.

But no country can pride itself on being totally safe from a natural disaster of an unexpected scale. The French nuclear industry must therefore ratchet up one more notch its investment in safety and strengthen the means of university research. It must imagine events of even greater intensity, cascading accidents, with interactions between neighbouring industrial sites. Investment must be made by placing safety requirements above any economic consideration and in strict compliance with the specifications of public authorities supervising safety.

*September 2011*

The report is downloadable from: <http://www.assemblee-nationale.fr/13/rap-off/i3614.asp>

<http://www.senat.fr/rap/r10-701/r10-7011.pdf>