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RADIOACTIVE WASTE MANAGEMENT

LONG TERM SAFETY REQUIREMENTS AND SOCIETAL EXPECTATIONS

A review of the main themes discussed at the eighth EUROSAFE Forum held in Paris in November 2006.

TO OUR READERS

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➤ All the papers referred to in the seminar section of the present issue are available at www.eurosafe-forum.org

Lothar Hahn and Jacques Repussard

In the nuclear sector, matters to be dealt with exceed the technical scope by far and, whatever country is considered, political and societal issues are at stake besides engineering. Obviously, the long-term management of radioactive waste is no exception, all the more when high-level, long-lived radioactive waste is concerned. Bearing witness to this, the EUROSAFE Forum held in Paris in November 2006 was titled *"Radioactive Waste Management: Long Term Safety Requirements and Societal Expectations"*.

Four conditions widely recognised as prerequisites are to be fulfilled to manage high-level, long-lived radioactive waste. First of all, consistent legislation is needed to establish a clear framework for handling all the aspects associated with the creation of a storage or a repository. Then, people in charge must be identified for each task to be carried out and empowered with the appropriate means and resources to fulfil their respective tasks. A third and pivotal prerequisite is a set of procedures aimed at efficiently involving the stakeholders, ranging from MPs to local associations and to individuals. This entails an ability, at each step of decision-making, to take their perspectives into account and to convey rational reasoning in a trustworthy manner. Last but not least, the successive steps conducive to a radioactive waste disposal facility must be scheduled in a legible way over several decades encompassing the creation, operation and post-operation of the repository. In the case of France, these four steps were covered by the new legislation on radioactive waste which was adopted in June 2006.

By reporting notably on the work performed by the French Commission for the Public Debate on Radioactive Waste Management or on the lessons learned, the MP elected in the departement of Meuse, where an underground laboratory is being excavated in the clay formation, the present issue of the EUROSAFE Tribune intends to provide the reader with insights on the experience gained in building confidence between experts and laymen, and in getting stakeholders to contribute to the decision-making process. We wish you pleasant reading.●

WELCOME
ADDRESS & PRESENTATIONS

The European TSO Network on its way

■ Welcoming the participants to the Paris EUROSAFE Forum 2006, Lothar Hahn, the Technical and Scientific Director of the German technical safety organisation GRS, announced the creation of the European TSO Network through a Memorandum of Understanding signed at the end of May 2006 with his Belgian and French counterparts, Jean-Jacques Van Binnebeek (AVN) and Jacques Repussard (IRSN). Mr. Hahn reported about the first steps taken by the newly born network to foster convergence among the European TSOs.

"Last year, Jean-Jacques Van Binnebeek and Jacques Repussard informed you that we had decided to considerably intensify co-operation between our organisations. Today I can report that we have agreed on the form of a network, and that we signed a Memorandum of Understanding accordingly at the end of May 2006. The aim of this network is to promote European scientific and technical co-operation of the TSOs in the field of nuclear safety, systematically exchange R&D results and experience in connection with the operation of nuclear facilities and safety assessments, promote harmonisation of nuclear safety assessment practices in Europe, and encourage initiatives to define and implement European research programmes," Mr. Hahn declared. Shifting to the working programme of the freshly created network, he mentioned the following steps:

- first meeting of the Network's Operating Committee to identify the main areas of work for the near future;
- the development and revision of a Safety Assessment Guide applied by AVN, GRS and IRSN;
- the identification of research needs on a European level;
- the enhancement of knowledge management among AVN, GRS and IRSN;
- new methods and structures to enhance effectiveness of operating experience feedback in Europe.

"The ball has been set rolling and I am sure that we are moving in the right direction. Membership of other TSOs will be at the invitation of the current members after a phase of consolidation," Mr. Hahn concluded. ■

Different views on the radioactive waste management issue

■ Bearing witness to the EUROSAFE Forum's international reach, a Japanese speaker, Mr. Hideki Nariai, President of the Japan Nuclear Energy Safety Organisation (JNES), opened the presentation session of the 2006 meeting devoted to the long-term safety requirements and societal expectations associated with radioactive waste management.

As the President of the technical support organisation created in 2003 to provide the regulatory authority for commercial nuclear facilities in Japan [1] with scientific and technical guidance, Mr. Nariai gave the audience a sense of the Japanese policy for the management of radioactive waste. *"The high-level radioactive waste is subject to geological disposal into a stable geological formation at more than 300 m deep"* Mr. Nariai explained.

Next came Yves Marignac, Director of the Paris based NGO WISE, who delivered a speech about the hazard potential of the production of radioactive material and waste used to generate nuclear energy. *"When making choices in terms of* [radioactive waste] *management, the balance between the different risks and the share of burden between the population in the territories and the generations should be considered. These balance and share have to be much more explicitly assessed than today and need more and better discussion for choice to be made on a consistent basis and the current risks to be clarified and accepted,"* Mr. Marignac advocated.

Given by Benoît De Boeck, Deputy Director General of the Belgian TSO Association Vinçotte Nuclear (AVN), the third speech [2] pertained to the respective national policies for waste management implemented in Belgium, Germany and France. Mr. De Boeck pointed out that although the scientific feasibility of partitioning and transmutation has been demonstrated to turn long-lived radionuclides into short-lived elements, substantial research under international co-operation is still needed to make such processes operational. *"Each nation is able to choose a waste-management strategy from more than one option, and this can be done with no undue burden on future generations. I would like to emphasise that the nuclear energy field is a pioneer in this respect and we need the full support of the ecologists to continue in that way,"* Mr. De Boeck concluded. ■

(1) The regulatory authority for commercial nuclear facilities in Japan is called Nuclear and Industrial Safety Agency *(NISA).*

(2) The text was co-authored by Benoît De Boeck (AVN), Bruno Baltes (GRS) and François Besnus (IRSN).

Yves Marignac
Director of WISE (France)

Radioactive waste management: lessons learned from public debates

■ Chairman of the French Commission for the Public Debate on Radioactive Waste Management, Georges Mercadal, was invited as a speaker to the 2006 EUROSAFE Forum. This Vice-Chairman of the French General Council for Bridges and Roads reported on his experience of public debates, providing critical analysis and principles of governance to deal with the management of high-level, long-lived radioactive waste.

"Public debate is neither a referendum nor a survey. It is a series of critical hearings on a given project or options as well as a dialectic between critical analyses and arguments advocated by those who back the project. The outcomes are a comprehensive round-up of the argumentation provided by all parties and, sometimes, proposals resulting from collective thinking that should not be disregarded by decision makers," Georges Mercadal summarised, drawing upon his experience as the Chairman of the French Commission for the Public Debate on Radioactive Waste Management. In his speech, Mr. Mercadal started with reminding the audience of the three majors prongs of public criticism to suggest principles of governance to address them.

Georges Mercadal

Chairman of the French Commission for the Public Debate on Radioactive Waste Management

> Analysis of the criticism voiced by the public

- The lack of confidence, fears and a collective attachment to the land are common denominators among the public participating in a debate when it comes to erecting a new facility in the vicinity, whatever facility may be concerned. The lack of confidence is linked to the feeling that the judgment of scientists and engineers is biased by their loyalty to the organisation they belong to. Fears are associated with the idea of life-long exposure to low-level radiation released by the waste disposed underground. Collective attachment to the land as a deeply-rooted identity strengthens as society goes increasingly complex and globalises.
- The representations associated with nuclear waste translate into the criticism voiced by the public. Time is a specific dimension of the nuclear waste issue: the public cannot envision thousands of years and denies scientists or engineers any ability to do so. Throughout the world, the Earth is widely regarded as having rights mankind cannot disregard. Adding to this, the public's attitude towards science has changed: at the end of the 19th century, people's expectations towards science were very high; today, these expectations are mixed with distrust against uncontrolled "proliferation" of science. Conversely, confidence in society's maturity has been growing: the opinion is widely shared that, if society is aware of potential hazard, it will take care of it in depth, providing trustworthy solutions.
- The refusal of "marketed knowledge" largely inspires stakeholders' criticism

during debates, as the public wants to be "assured" and not "reassured". In other words, people are not ready to absorb passively the knowledge packaged by those "who know about". Therefore, the traditional idea of public acceptance based on communication and public relations can be regarded as irrelevant, the public being rather ready to task fellow citizens who acquired deep knowledge on the subject with asking questions and relying upon knowledgeable, independent experts to make their own opinion. This attitude shows that some knowledge pertaining to nuclear waste management is still poorly shared and that a constructive dialogue with the public must be part of a governance conducive to trust, equity and open-mindedness.

> Suggestions for governance principles

Building confidence

Trust is the basis for any dialogue strategy as it governs what is felt by the public, including fear. In this respect, it should be regarded as the prerequisite for any endeavour towards governance. Important factors for successfully building confidence are as follows:

- *the management of time:* rushing is detrimental to filling stakeholders with confidence;
- *the sound structuring of all the parties involved*, e.g. the set-up of bodies open to the public for discussing all safety issues;
- *the availability of pluralistic expertise* capable of providing the public with "stereoscopic" views on issues. The price of truth is questioning, contesting and debate. The public starts trusting scientific statements only when they can be questioned and debated openly among people from distinct origins, e.g. persons in charge and experts belonging to various organisations, motivated by different stakes. Then, regardless of their degree of understanding, members of the public somehow manage to segregate what is wrong from what is right.

Equitable treatment of the land

If any local population feels deceived or trapped, its reaction is – inevitably – rejection. This happens for instance in the case where two underground laboratories are planned in two different rock beds and only one is finally excavated. The neighbouring population is then unavoidably opposing the project, for reasons linked to the procedure rather than to the project itself.

The exploring of alternative solutions

The possibility of alternative solutions is perceived positively by the public. Moreover, the cross-fertilisation among different research directions is a frequent matter and can therefore be regarded as a mere precaution. In the case of high-level, long-lived radioactive waste, the possibility of reversible disposal should be considered as an alternative to irreversible disposal. "The principle of reversibility being 'encapsulated' in law, 'perennial' storage remains an option alongside the final disposal in rock formations," Mr. Mercadal concluded. "It can therefore be regarded by the public as an application of the principle of precaution, since it gives the possibility to retrieve waste packages as long as uncertainties are associated with underground disposal". ■

Bruno Cahen

Head of Safety, Quality and Environment Division, Andra (France)

***"Nuclear waste disposal is no area where one single possibility is at hand**, but where various options – sites, techniques, etc. – should be considered equally until sufficient elements are gathered to evidence the most practicable solution from an industrial perspective. In this sense, each repository will remain a prototype. I think it is important to use a fairly down-to-earth approach that consists in comparing real-world facts with long-term contemplations in order to provide guarantees. In this respect, labs should be designed as 1/1-scale pieces of eventual storages or repositories aimed at evidencing the feasibility for such facilities to be constructed, operated, maintained, safeguarded, etc. in a satisfactory manner. French law considers storages and repositories as complementary facilities, thus providing sufficient time lapse for appropriate decisions pertaining to the disposal of high-level, long lived radioactive waste to mature."*

PANEL DISCUSSION →
IN SEARCH OF THE RIGHT BACKYARD

■ Moderated by Marie-Dominique Montel, a French radio and TV journalist, the traditional panel discussion gathered, on the stage, Josefin Päiviö Jonsson, Head of Section of Repository Safety at SKI (Sweden), Hans Issler, President of Nagra (Switzerland), Phil Davies, Head of Waste and Nuclear Materials Strategy at NDA (United Kingdom) and Thomas Flüeler, Senior Research Associate of the Institute for Human Environment Systems (Switzerland). This year's topic: the short- and long-term issues associated with the geological disposal of high-level, long-lived radioactive waste.

> Addressing public concern

Taking the first question from moderator Marie-Dominique Montel: "*What are the most important technical issues when you are dealing with the public opinion and asked to talk to the stakeholders in your respective countries?*" Phil Davies stressed that radioisotopes are highly technical issues and that experts should strive for finding a way to provide explanations in clear language without being 'patronising' to the public. "*If you can bring such kind of language as* " This site is a good site because it had held natural gas below the ground for millions of years, perhaps it can contain radionuclides for millions of years", *I think it will help,*" he added. Drawing upon his experience of the Swiss arena, Hans Issler pointed out that the two issues traditionally raised by the public are the fear of radioactivity and… timescales exceeding their imagination: "*People cannot understand how we can make a prognosis over those long timescales when we do not even know what the weather will be in a month! How can we say how these things will behave and explain how our safety analyses have been built up?*" he commented on the difficulties linked, for

instance, to showing safety cases to the general public.

"If we compare a waste disposal facility to an active technical system like nuclear power plants, with lots of compartments, tubes and vaults, then we will have to say it is really simple! The challenging thing is that it is not a very well defined system, because it is geologically evolved and not man made," Thomas Flüeler highlighted, advocating that the understanding of a repository should be good enough to allow experts to put it plainly in terms of geology. *"The foremost thing is that the people who are explaining these things must be really trustworthy in the sense that they are independent, so the public will not assume they have an ulterior motive or hidden agenda,"* Mr. Flüeler claimed, echoed by Mr. Issler: *"Trust and confidence are important. Society must be able to trust the independent nuclear regulators who do their best job. Nuclear waste disposal is such a complex issue that I think the general public cannot follow it in detail if they do not have the confidence that we have tried our best to answer their questions".*

> Scheduling decisions appropriately

"What does temporary mean to you? What is the psychological limit for people?" Marie-Dominique Montel asked, raising thereby the issue of the right timing for making decisions related to underground waste disposal. *"A period of 300 years is sometimes mentioned for interim long-term surface storage"* Phil Davies indicated *"But try to cast your mind back 100 years before the French Revolution, and think forward 300 years at the same time. It is extremely difficult for most people to handle those figures. The unreliability of society and safety systems is one reason why the Committee on Radioactive Waste Management in the UK have advocated going underground"*, he added.

While he acknowledged that the technical reason for a 30- to 40-year interim storage is to enable the waste-generated heat to decrease to an acceptable level, Hans Issler reminds the floor that *"our society is benefitting from nuclear technology and we should not pass our problems on future generations. If we can take care of it, we should do it now. If we do nothing now, we do not know if science, technology and knowledge will still be available in 50 years or if we will have to start again".*

> Siting the eventual repository

Introducing the audience to the Swedish legislation, Josefin Päiviö Jonsson explained that, whatever application is concerned, the applicant must evidence that he has found the best site for the facility. *"The demand is then passed on to SKB, which also must prove that it is the best site. As a reviewer of the application – along with the Environmental Court, which performs a parallel review of the application – SKB must be convinced that the best site was actually found,"* Mrs. Jonsson summarised. Considering the self-evident truth that one must have the most suitable site to develop, Phil Davies stresses the diffuse nature of the word 'best': *"This word does not necessarily mean the best geological site, it has to meet lots of criteria. When you talk about safety, one of the safety risks is related to construction and transportation, not to something that happens a million years from now!* →

Phil Davies

Head of Waste and Nuclear Materials Strategy, Nuclear Decommissioning Authority – NDA (UK)

"The NDA was founded to take charge of the nuclear site cleanup mission in the United Kingdom. *We were fully operational in March 2005 and took over 20 sites. Sellafield, which is both an operational site and a clean-up site, dominates everything with 50% of the waste and the money. We operate on quite detailed contracts and lifetime plans, fully budgeted and scheduled with risk built in and all the related information getting published. This is a big step forward compared to where we were a few years ago when the Government had little idea of what its liability looked like. Now the total liability is estimated to £63bn. We are very careful to stay out of the line between the site operators and the regulators. The EUROSAFE Forum is a good opportunity for us to be seen and to sow a few seeds about international rationalisation of R&D to try to draw the whole picture together. Let's get the whole knowledge base sorted out to perform coherent work together!"*

→ *So, 'best' is a site that combines all these attributes. It must be the right site and you have to demonstrate it against lots of attributes, not just geology,"* he advocates.

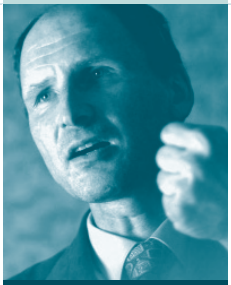
A very challenging issue to Hans Issler is that, the site selection is the end of a process that takes tens of years in any country. *"In Switzerland,"* Mr. Issler points out, *"it will ultimately be chosen between two sites and decided which one is best suited to build the repository. The reason for selecting two sites first and then one is linked to the politicians' demand for alternatives, backed by the local population who ask why the repository is to be located here and not elsewhere. It is therefore important to evidence that the selection process is following the requested criteria."* On his side, Thomas Flüeler recognises that it is not up to nuclear experts to decide, but to the decision-makers: *"I mean the politicians, whether they are MPs, Government staff or whoever. One of the key questions we heard today was: how safe is safe enough? This is a political question, not a technical one. The decision on what is safe is not ours. I think this is very hard to take, but it is a fact."*

> Conserving liabiltities and skills in the long run

Asked by the moderator what may happen with the knowledge necessary to operate and maintain repositories in countries where the nuclear industry would decline or phase out, Phil Davies seems confident in the regulatory requirements: *"There is a little ray of hope. If you look at the licensing of nuclear sites, the site licence lives forever. The site licensee carries legal responsibilities and the regulators bear down on them constantly and actively. So, although there are no guarantees, there is an institutional framework which has many decades of proven performance behind it. In the UK for instance, there is certainly a very assertive regulatory regime. I think the best hope is that it will continue for more decades."* Mrs. Päiviö Jonsson considers the issue in a different manner, stressing that the generation who has gained from nuclear power should also take on the responsibility of taking care of the waste. *"In Sweden, we have the money in the waste fund, we have the knowledge in the nuclear business to deal with this waste as we still have nuclear reactors, so why shouldn't we take this responsibility right now?"* she claims. *"I fully agree that this generation has to take its responsibility,"* Thomas Flüeler asserts *"However, I would add that the principle of sustainability is not relying only upon passive safety, but also upon some kind of control. It must be a final geological disposal and we – or future generations – will have to seal it. This repository should be retrievable for a certain amount of time and should be controlled and monitored, not only from the surface but also from below. In this respect, I think some reconciliation is possible between passive safety and intervention."*

> Sharing R&D findings

Disagreeing with the opinion that the research and development findings are largely shared between countries, Phil Davies advocates: *"No, they are not. It is a problem we have in my own organisation, the NDA. We do sponsor a certain*



Thomas Flüeler

Senior Research Associate, Institute for Human Environment Systems – IHES (Switzerland)

***"I am glad to see that the increasing emphasis placed on non technical issues is reflected in the EUROSAFE Forum**, even if a two-day format does not enable much more than fragmented, superficial exchange. I would like to point out how much participatory aspects are contributing to the success of such issues as the geological disposal of radioactive waste. My experience in this domain is that people have to be consulted, that their perspectives and their rational have to be listened to. Beyond technical matters, it is thus necessary to address governance issues – stakeholder involvement, identification of research issues in the non technical field. Then, at the end of the day, the 'real' challenge is to reconcile contradictions: e.g. designing final disposal safe for 1 million years vs. considering claims of reversibility. This requires looking at the interface between technical and non technical matters to conceive both technically and socially acceptable approaches."*

amount of R&D; universities do other things that we are not quite aware of; the site licensees do other research and development, and there is international collaboration. So, there is a whole network and one of our biggest challenges is to make some sense out of it and see if we can map it against our mission. Collaboration does happen once you start looking at it, but there is a long way to go." A little more optimistic about the subject, Hans Issler claims some international co-operation in the field of radioactive waste management: "*We have two rock laboratories at the Mont Terri site, one in granite and one in clay, and about a thousand organisations are participating in both, beginning with the implementers and some of the nuclear inspectorate regulators. So, this is a kind of knowledge sharing that contributes also to making research results transparent to everybody.*" Josefin Päiviö Jonsson also acknowledges the benefit from sharing skills on an international level: "*Sweden is a small country and our research capacity is quite limited. SKB has 'vacuum-cleaned' the researchers in Sweden but we, as authorities, need to look outside Sweden to find competent researchers. We use a lot of researchers from the UK and other countries,*" she recognises.

> Cultural differences: myth or reality?

Whereas communities in Finland are competing for a new reactor unit and Swedish municipalities that have nuclear facilities on their territory are very interested in being a possible site for a repository, any spent-fuel shipment triggers opponent demonstrations in Germany… "*Does that mean that we have huge differences in Europe with respect to technology acceptance or risk perception, or even cultural borders in this respect?*", a person from the audience asked. Taking that question, Josefin Päiviö Jonsson stressed that, in Sweden, people generally tend to trust authorities. "*Both of the municipalities already involved in the siting study have experience of nuclear waste facilities, they have experience of SKB and they trust the organisation*", she claimed, adding "*the Östhammars municipality has the SFR facility for low- and intermediate-level waste, so they have experience of SKB's achievements and they trust the organisation. On its side, Oskarshamn has the CLAB interim storage facility for spent fuel, so they already have significant quantities of radioactive materials in their municipality. Both municipalities say they want to take the responsibility of participating in a safer solution for disposing nuclear waste.*" Giving an insight into the Swiss habits, Hans Issler concluded the panel discussion with these words: "*I am not sure if people in Europe react differently. In a highly industrialised country, I think we are more or less sensitive to technological issues. I also think there is more scepticism today against experts and complicated issues. One point in Switzerland is that the Swiss know there is always a referendum in the end at the national, canton or community level*". ■

Didier Gay

Head of the Geosphere-related Risk Analysis Department, IRSN (France)

***"Following a long period of time where societal expectations gained increasing consideration from the French public authorities**, practical decisions are implemented on different levels: the transparency act provides a legal framework to such issues as the debates pertaining to the EPR or the disposal of nuclear waste, whereas a Nuclear Safety Authority (ASN) is in place since November 2006 with larger prerogatives than the previous safety body. This change is embodied, notably, by the Pluralistic Expertise Group set up to reflect the views voiced by the various stakeholders involved in the debate pertaining to the site remediation of the uranium pits formerly operated in the Limousin region. For several years, IRSN has been playing a significant part to promote pluralistic expertise and to put its own scientific and technical experts at stakeholders' disposal. The societal aspect of nuclear safety issues is thus more and more commonly 'encapsulated' in IRSN's scope of work, i.e. in the assessment of safety and radiation protection aspects of nuclear activities, including site remediation."*

GUEST LECTURE →
MATTERS OF INTEREST

As a French MP elected in the *département* of Meuse and mayor of Commercy, François Dosé represents the territory where an underground laboratory is being excavated in clay with a view to assessing the feasibility of a future repository for high-level, long-lived radioactive waste in such a formation. In his address, this guest lecturer at the 2006 EUROSAFE Forum shared with the floor his experience and views on how to balance issues of general interest and local sensitiveness.

François Dosé

MP from département of Meuse and mayor of Commercy (France)

› Nuclear safety and social expectations *or* social safety and nuclear expectations?

In his introduction, François Dosé pointed out the Meuse General Council's unanimous approval for an underground laboratory to be created in the Bure region, since clay was regarded as an appropriate host rock. Then he asked the following question: "*Let us assume the public debate had not been organised under the conduct of engineers, scientists and institutional representatives, but merely by politicians at local level. Would the debate's topic on the invitations cards be described as* Nuclear safety and social expectations? *I doubt it! I rather think the wording would had been* Social safety and nuclear expectations!" Put as a joke, the question still clearly epitomises the perception widely spread among citizens who feel compelled to accept decisions made by the nuclear community, whereas the only thing they want is safety for themselves and their descendants.

› Some considerations on…

Public acceptance

The French population's increasing awareness of the impact of CO_2 releases on global warming modifies its perception of the right energy mix. Nuclear energy is acknowledged as being one 'inevitable' energy source in the long run, as being part of the necessary energy diversity.

The image of waste

All nuclear facilities are not regarded in the same way: a nuclear reactor is perceived as a facility that produces, generates, 'gives birth' to something useful whereas a waste repository is rather perceived as a cemetery, a place to bury 'dead things'. This difference translates into dissimilar emotions. The neighbouring population of a repository feel disregarded and thinks: "*Since the Paris metropolitan area is made of the same clay bed as the Bure region, why not consider dumping nuclear waste there?*" This emotional load

is to be accounted for, granted respect – even transcended – when it comes to making decisions.

> Time scales beyond reach

Eternity is far beyond a human being's time scale. Therefore, nobody can figure out what could happen in 10 or 20,000 years. This is a real difficulty when talking about long-lived radioactive waste.

> Living territory vs. administrative territory

The feeling that the burden and income associated with the installation of a nuclear waste repository are not equally shared is a touchy issue to be dealt with. For instance, Bure is located at the border of 2 different administrative regions. The population living 150 km away in the same administrative region does not mind the burden while benefiting from the financial resources. Conversely, those living only 25 km away in the neighbouring administrative region do worry about the burden but do not enjoy the associated income. Extrapolated to a larger scale, the European Union, the problem remains the same between two neighbouring States, when one gets electricity from atom and the next one stands against that form of energy. Furthermore, if a Member State imports nuclear kilowatts generated in another one, whom does the corresponding waste ultimately belong to?

> Scientific legitimacy

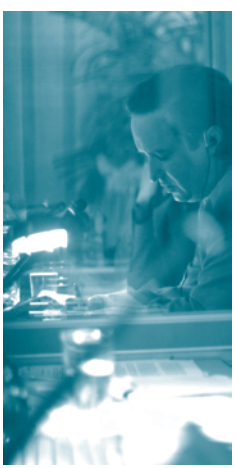
Scientists belonging to institutions are commonly subject to certain mistrust from the public since they are not perceived as 'independent'. But what and whom are they supposed to be 'independent' from? Provided that pluralistic views are reflected, aren't perfectly identifiable links of dependency preferable to make one's own judgement?

> Practical democracy

Is a referendum necessary for any decision to be made? Member of Parliament François Dosé obviously does not consider general interest as the sum of different class interests (territories, trade unions, etc.) expressed through polling. The point is rather to see to it that all views are accounted for in the decision process, in order to get the final decision recognised as legitimate by all parties, including opponents. To him, democracy is a matter of giving and receiving, expressing oneself and listening. It is also the safest way to avoid 'democratic harassment', i.e. the gesticulation of a vociferous minority that feels disregarded by institutional parties which, they claim, have incommensurate means at their disposal.

> Uncertainty

Risk is consubstantial to life and must be recognised as such. Such concepts as retrievability and irretrievability, principle of precaution, GMOs, etc. include uncertainty to some extent. This is why such a decision as building a nuclear repository cannot be made merely by scientists if that decision is to be socially acceptable. This obviously does not mean irrational thinking should prevail! It only means all stakeholders should strive further to search for the best possible solution… with humility. ■



Nuclear Installation Safety: Modelling complex phenomena ever more realistically

■ Since the Paris 2006 EUROSAFE Forum onwards, the research and assessment aspects of nuclear installation safety have been merged into one single seminar termed "Nuclear installation safety". This decision meets the wish voiced by attendees interested in both aspects to avoid missing lectures when research and assessment topics were dealt with separately and in parallel. It also places emphasis on the close link between the research needs of technical support organisations and their assessment activities. The lectures given at the seminar also evidenced the trend towards closer co-operation among experts on an ever increasing number of programs.

› Background of the seminar

As shown by the different lecturers at the seminar devoted to nuclear installation safety, the enhanced integration of research and assessment activities contribute to improving both the quantification and understanding of the risk, drawing upon deterministic and probabilistic methods. In this context, a large part of the research topics debated at the seminar were devoted to probabilistic safety assessments (PSAs) and, more specifically, to PSA level 2, based on source-term codes such as ASTEC, the integral code jointly developed by IRSN and GRS for light water reactor (LWR) source-term severe accident assessment. Considered as the reference European integral code through its role in the Severe Accident Research Network of Excellence (SARNET) in the 6th Framework Programme of the Euro-

Hans Issler

President, Nagra (Switzerland)

"I think it is important to stress that radioactive waste is under control in European countries, since subsequent interim storage facilities are operated. *What remains to be solved patiently is the final disposal issue. What kind of long-term solutions are expected by the public? That is the question. In this respect, it is worth pointing out that the idea of 'retrievability' is introduced in most national programs, leaving to future generations the possibility to make proper decisions. Now, concerning the site selection process – arguably the most difficult step in implementing a repository! – public concern about the disposal's impact on the 'village's day-to-day life' should be carefully considered. Positive economic impacts like number of workplaces and regional investment created by the disposal facility should be balanced with the possibly negative impact on the image of an agricultural or tourism area. In this approach, the financial compensation paid to the local communities for hosting an underground waste disposal facility should not be regarded as a compensation for some risk but for the use of the underground, which is public property."*

pean Commission, ASTEC is for instance the calculation code used by IRSN for level 2 probabilistic safety analyses performed since 2006 on 1300 MWe PWRs in France. In Germany, a long-term experiment conducted using PSA level 2 allows to complement the safety studies performed on all types of reactors in the German fleet, thus allowing not only a quantification of the probability of phenomena such as core meltdowns (taken as quantitative measure for safety policies), but also the assessment of their consequences. Unlike the United States of America, where the risk-informed approach is conducive to ranking the safety of NPPs, European safety organisations are rather more interested in finding possible weaknesses in the design or operation and performing precursor analyses accordingly. Significant improvements are at stake, driving European nuclear safety research and assessment organisations to pool their respective human resources and facilities in long-term research programmes with the help of the SARNET network.

> Major co-operations and achievements

The contributions debated at the seminar provide valuable insights into the progress achieved in such domains as:

- *The assessment of pre-accidental situations*. The paper advocated that precursor analyses provide a lot of information on the structure of the risk, since the underlying dominant factors can easily be determined. They also trigger studies on similar events and conditions with the potential to yield ever broader findings. Moreover, precursor analysis results can be used to communicate in a more objective way on the safety significance of events, e.g. between regulators and utilities.
- *The understanding of highly complex phenomena*. Powerful computers shared by research teams allow the fine modelling of complex events (e.g. those coupling thermal-hydraulic and neutronic phenomena), thus reducing the need for costly demonstration experiments aimed at validating or updating calculation codes. Residual experiments are, however, conducted as part of co-operation programmes in facilities such as the primary coolant loop (Primärkreislauf, PKL) test facility at Erlangen (Germany) where accidents are triggered at a 1/30th scale to validate the codes.
- *The understanding of time and time-dependant factors* in the assessment of accidental sequences as well as of the part of human factors. Dynamic PSAs are capable of detecting situations which were not thought of before, but which might occur with a relatively high probability. Moreover, they provide much more insight into complex non-linear systems than conventional PSA approaches do. Coupled with dynamic PSAs, a "Crew-Module"-type simulation tool allows to simulate human actions as a dynamic process which evolves over time while interacting with the stochastics.
- *Contamination transfers to the environment*. Modelling validated through experiments helps understand the contamination transfers to the environment through cracks in the reactor building concrete. Findings are essential to ensure the leak-tightness of the ultimate containment barrier in the event of →

Reinhard Stück

Head of Plant Engineering Department, GRS (Germany)

"My speciality is reactor safety, not waste management. *I therefore couldn't give expert views on the subject. Nevertheless, I think the situation in Germany is uncomfortable, since we don't have any clear strategy to proceed with the interim and final storage of radioactive waste. The problem is considered differently between federal government and* Länder. *This may come from the situation that the Federal Government is the applicant of a final storage and not the* Land *where the final storage facility will be built. In this respect, the main challenge associated with the management of radioactive waste remains, to me, public acceptance. And whatever solution is to be designed, it will have to be regarded as a credible one by the public. I assume most of the technical issues are probably solved today, but the problem remains to communicate towards the public and to get the technical solutions translate into policies… and politics. Mass media contribute only very little to this, since scientific and technical facts are rarely spectacular enough to 'sell'."*

→ a severe accident conducive to fission product releases and also in the definition of a safety policy aimed at preventing the ageing of the reactor containment.

> Future developments of probabilistic safety assessments

Validation of simulation codes for accidents was largely improved thanks to the experiments carried out in research facilities, enabling all kinds of uncertainties to be taken into consideration. Today, PSAs are updated to include the latest experimental findings and outcomes from research. These advances provide nuclear safety experts with a clearer vision of the significance of any incident, evidencing for instance the necessity to re-prioritise apparently insignificant incidents if their probability as a precursor is high.

Major challenges for future research consist in fully considering the uncertainties of the models and in simulating complex events, including the human factor, in an ever more realistic way. ■

Josefin Päiviö Jonsson

Head of Section of Repository Safety, Swedish Nuclear Power Inspectorate – SKI (Sweden)

"In the radioactive waste disposal area, Sweden gets lots of attention for making things very smoothly and involving stakeholders successfully. *But it has to remembered that the situation was not so smooth at the beginning, when studies were started, back in the mid-70s! There were demonstrations against SKB's early site investigations and SKB learned to know that it does not make sense to force the municipalities who are opposing a project. The company thus sent letter after letter to the municipalities to explain its project's rationale and to initiate a patient dialogue with the local communities. Sweden is now regarded as an example, but it took significant time and financial resources to deal with the issue. Another important issue is what is generally termed 'compensation' for accepting a facility. I think this is the wrong approach to what should be genuinely considered as the 'added value' a facility can bring to the municipality alongside new infrastructures, newcomers who will pay taxes, etc. Last but not least, I would like to highlight that Sweden has also learned a lot from other countries' successes and failures."*

Waste Management and Environment: Confidence-building, a key to successful waste management

Largely addressed in the 8th issue of the EUROSAFE Tribune titled *Nuclear waste disposal: safety and acceptance* (July 2006), the context of nuclear waste management and environmental protection was recalled at the EUROSAFE Forum seminar devoted to this topic with a view to highlighting the status of research and implementation programmes conducted in the EU and abroad. The different contributions evidenced the need, beyond calculations aimed at modelling the complex migrations though the barriers, for a confidence-building process based on deeper understanding of geology and the safety elements related to future repositories. The increasing convergence among technical safety bodies, supported by international organisations such as the Nuclear Energy Agency of the OECD (NEA), was also pointed out by many lecturers.

The 2006 Waste Management and Environment seminar was focused on the management of high-level radioactive waste (HLW), as it calls for safety authorities to specify regulatory requirements and for technical safety organisations to prepare for assessing safety cases established by operators in order to demonstrate the feasibility of repositories capable of ensuring the safe disposal of HLW over geological time scales.

> Paving the way to practicable solutions

Titled, respectively, *Safety of direct disposal of spent fuel and of disposal of reprocessing waste* and *European pilot study on the regulatory review of the safety case for geological disposal of radioactive waste* the two first papers provide overviews of safety issues associated with radioactive waste, from the production step through to disposal, as well as of the amount of waste expectable over the next 40 years in countries such as Belgium, France and Germany. Since the repositories are to be installed in geological formations with a view to providing leak-tight containment of radioactive waste over thousands of years, international pilot studies are presently carried out to provide regulators with the scientific basis needed for specifying requirements based on in-depth knowledge of geological phenomena. The papers show that, if understanding of such phenomena as radionuclide migration →

→ through the barriers has improved within the last ten years, there is still a need for building confidence regarding the safety aspects of the design and operation of a HLW repository. In this respect, the different approaches adopted by Germany for instance, where the geological bed is considered as the main barrier, and France, where emphasis is placed also on waste packaging, will provide valuable benchmarks to the other Member States engaged in setting-up their own radioactive waste management policy.

› Major scientific challenges

In all countries, the disposal of HLW is regarded as the real challenge associated with the management of radioactive waste; in some of them, this issue was granted priority on the 2006 agenda, even if 'industrial' solutions are not to be implemented within the next 30 to 40 years. Developing models capable of simulating the behaviour of rock formations and the interaction with the packaged waste, collecting data to set up safety cases that provide criteria for selecting both a site and a disposal concept, determining an overall approach conveyable to the public… these challenges were addressed by several speakers at the Waste Management and Environment seminar of the 2006 EUROSAFE Forum.

The papers titled *Development by AVN of review guidance for safety assessment of radioactive waste disposal* and *NEA Perspectives on Timescales and Criteria in Post-Closure Safety of Geological Disposal*, respectively, provide interesting insights into the specific time scales and criteria linked to the post-operational phase of repositories. In addition, the paper titled *Focus on isolation and confinement rather than on potential hazards: an approach to regulatory compliance for the post-closure phase* suggests guidelines to demonstrate the isolation potential of the geological system in relationship with the recommendations provided by GRS to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, BMU) as a basis for issuing guidance pertaining to post-closure operations.

› Complex issues… but no hurry

A fairly knotty problem compounding hydrogeological, geochemical, geotechical, radiological, environmental, societal as well as many other aspects, the siting and installation a of high-level waste repository still can be contemplated serenely, as its implementation is not absolutely needed before several decades, waste being produced in small volumes [(1)] and requiring for some of them a 40- to 50-year cooldown period in interim storage facilities prior to final disposal. The experience feedback from Yucca Mountain (USA) or Gorleben (Germany) evidence the difficulty associated with any siting process and the benefit resulting from the systematic involvement of stakeholders in decision-making. In their papers titled *Diffusion experiments at Mont Terri: overview and results*, *Time-dependent evolution of the excavation damaged zone in the argillaceous Tournemire site* and *Requirements and methods for comparing safety of sites for*

Vincent Nys

Waste, Dismantling and Decommissioning Project Manager, AVN (Belgium)

*"**Today, emphasis is placed on the technical challenges** related to the geological disposal of high-level, long lived radioactive waste. Nevertheless, I think near-surface disposal should be paid equal attention, since waste is located close to the biosphere, close to human life. In this respect, I do not think it should be distinguished between the technical and human aspects of the issue, since both contribute to the overall robustness of the disposal concept. Repositories are technically designed to provide the safe disposal of waste over eras exceeding by far the horizon of human life, but there is still a period of time where design does not suffice to provide expected safety. This is a period of relative 'sensitiveness' in the repository's life where radioactivity levels are still significant, making monitoring and custody mandatory to hinder, for instance, any malevolent intrusion. Setting up the appropriate administrative and human organisation is a difficult task one is not faced with in the case of geological disposal."*

disposal of radioactive waste, respectively, the authors plead in favour of:

- extensive knowledge gained by conducting in-depth research and *in situ* experiments in various rock formations such as clay, granite or salt and comparing the results achieved;
- convergent analysis methods fostered by exchanging on the scrutinised safety cases among technical safety organisations under the auspices of the OECD/NEA.

Following this mindset, research is going on in Germany, independently from the siting process, with emphasis placed on clay formations, while the work performed to date in salt is widened and rounded off through additional research. In France, on-going experiments aimed at gaining additional knowledge about clay formations are continued in the Tournemire experimental station operated by IRSN in the south of the country in parallel to the work performed at Bure by Andra, the organisation in charge of the management of radioactive waste. Comparable work is performed at Mont Terri, in Switzerland, with a view to validating this type of rock prior to embarking on safety studies for an eventual repository. ■

(1) In Belgium for instance, vitrified high-level waste resulting from the reprocessing of spent fuel represented in 2006 a total volume of 253 m³. This conditioned HLW accounts for just 1.4% of the volume of radioactive waste but over 98% of total radioactivity stored at the Belgoprocess interim storage facility.

Hideki Nariai

President, JNES (Japan)

"The global warming makes it necessary to reduce drastically the releases of CO_2 and other greenhouse gases in the coming years. *I therefore hope the nuclear power's share in the total electricity production in Japan will climb from 30% to 40% over the next 20 years. Striving for an environmentally sound policy, Japan decided to use nuclear materials as effectively as possible by reprocessing and recycling uranium, plutonium and other reusable materials. We consider saving energetic materials the best way to secure our long-term power supply. Concerning the EUROSAFE Forum, our participation in such international meetings is an important part of our information strategy aimed at constantly improving our methods with a view to becoming a best-in-class player in the nuclear fuel cycle issue, including the final disposal of radioactive waste. In Japan also, it seems difficult to attract young skills into the nuclear sector and we are quite concerned by the possible shortage of young engineers to keep our technology – and our number one priority: safety! – at the best possible level. We therefore regard information exchange on an international level a significant part of our knowledge management policy."*

Radiation Protection: Pluralism, thoroughness and co-operation

The lectures and debates presented at the 2006 EUROSAFE Forum seminar dedicated to Radiation Protection provided complementary perspectives on the radiological risk associated with the nuclear power sector – ranging from uranium mining to radioactive waste storage – and with such other activities as the transport of radioactive sources. Reports were also given about the involvement of stakeholder associations set up to monitor the issues related to radioactive material and waste as well as about the ongoing radiation protection work performed within the framework of assistance programmes such as TACIS Belarus.

> Monitor radiation exposure outside of the nuclear power industry

Investigation on radiation exposure should not be restricted to the nuclear power sector but encompass all activities and technologies – industrial or medical applications, etc. – using radioactive sources: this is the issue raised in the paper titled *Radiation exposures of workers resulting from the transport of industrial radiation sources in Germany*. In the spirit of the international code of conduct for radioactive sources promoted by the IAEA and of the new European regulations, it is important, the authors advocate, to investigate for instance the radiation exposure of workers providing transport services for radioactive sources or using them for such special applications in industry as the measurement of layer thickness or the proof of welding. Such monitoring is necessary to establish that these workers are not exposed to additional radiation levels higher than natural ones.

> Involve stakeholders in improvement processes

As reported in the paper titled *The building of a Pluralist Expertise Group about uranium mines in Limousin (France)*, about 200 sites are currently under closure and post-closure phases in France after cessation in 2001 of any mining and milling activity. The respective ministries dealing with the environment, health and industry decided to set up a so-called 'Pluralist Expertise Group' with the aim to analyse the various technical documents prepared by AREVA NC for the monitoring of its mining sites in the Limousin region and to provide public authorities with recommendations to improve the current situation. The author explains how this group gathering local and national NGOs, independent scientists, experts from technical safety organisations, etc. prepares for making decisions on sensitive issues from technical, environmental and societal perspectives.

> Encourage public awareness and pluralistic expertise

The part of the so-called 'Local Information Commissions' set up in France in 1981 around nuclear sites notably for allowing local stakeholders to express their views on the impact of the facilities was explicitly recognised by the provisions of the Nuclear Transparency and Safety Act of 2006. Taking the opportunity of two public debates pertaining to the new reactor, EPR, and to the nuclear waste policy, respectively, the 'National Association of Local Information Commissions' (ANCLI, gathering 20 CLIs) managed in 2006 a mediator's position to obtain more time to be allocated for public debate, a working group to access information restricted for defence purposes and a watchdog on information.

In her paper titled *ANCLI white papers: a major contribution to public debate in France on nuclear waste policy*, the author explains how the 'Commissions' intend, through this national association, to:

- improve the objectivity, quality and diversity of the information made available to the public;
- encourage greater public awareness with a view to facilitating debate and allowing the public to express their views on issues such as radwaste management;
- foster the development of more diverse sources of expertise.

> Assess the effectiveness of international assistance programmes

The author of the paper titled *TACIS Belarus – An Overview of Results and Planned Activities in the Field of Radiation Protection, Emergency Preparedness and Waste Management* takes stock of ten years of EU assistance to the nuclear safety authorities of Belarus through the TACIS programme aimed at transferring Western European regulatory methodology and practices to several CIS countries. The results are deemed conclusive, as the introduction of norms by the Belarussian regulatory body and the technical support of Western TSOs allow a more effective management of the decommissioning of such facilities as research reactors or radiotherapy devices as well as a more effective mitigation of the Chernobyl accident.■

Thomas Riekert

Head of Division Nuclear Technology, TÜV Nord (Germany)

*"**To me, getting the public confidence in the technical and administrative work** performed to ultimately operate a repository doubtlessly is the most challenging issue associated with the management of radioactive waste. In Germany for instance, considerable research work was carried out since 40 years in the research sites Asse or Gorleben, but the different stakeholders were not really involved in this process and the knowledge gained was not communicated to the public in a sound manner. This probably rests with the political situation, but also with the difficulty for engineers to communicate towards non engineers. After decades of scientific and technical work devoted to selecting salt as an appropriate rock formation for providing the safe disposal of high-level, long lived radioactive waste, the assessment process should now be restarted from the very beginning on the grounds that salt would not be a satisfactory barrier… There is no particular risk linked to postponing decisions, but there is an ethical problem: how can we use nuclear energy, benefit from it today, and leave the burden to the next generations? I rather think decision makers should really use the scientific basis of the work performed to make decisions in an acceptable time frame!"*

Nuclear Material and Facilities Security: Going global

■ The speeches given at the 2006 seminar clearly reflect the major concerns linked to the physical protection of nuclear material and nuclear facilities: e.g. ensuring security against malevolent acts directed at nuclear plants or safeguarding fissile materials against theft and smuggling. With the world-wide spreading of new technologies, particularly in the field of information systems, emphasis is placed on new aspects such as 'cyber security', i.e. the protection of nuclear facility software against attempts of illegal access and tampering. As the international level of overall security still has to be raised, lecturers also highlighted the initiatives taken on a global scale, under IAEA, Euratom or G8 auspices, and the support provided by TSOs within this framework.

> The extension of nuclear security agreements

The enforcement of nuclear material and nuclear facilities security being an international challenge – although nuclear security is a state responsibility – the International Atomic Energy Agency (IAEA) provides Member States with assistance to improve nuclear security. The IAEA's Nuclear Security Program (NSP) approved by the Board of Governors emphasises assistance to Member States in implementing international instruments, developing international nuclear security guidance, assessing Member States' needs, and assisting with the development of human resources as well as outreach programmes. The Vienna-based Agency thus contributes to ensuring that a cohesive thread of nuclear security protects the global community. The paper titled *IAEA Nuclear Security Program* describes in particular the IAEA's support activities, divided into three areas: 1. Needs assessment, analysis and coordination, 2. Prevention, and 3. Detection and response.

> The evolution of international safeguards

The presentation titled *The International Safeguards* presents the enforcement, in France, of the safeguards resulting from the treaties and protocols signed by the French Government: Euratom Treaty, IAEA Non-Proliferation Treaty and Additional Protocol. The author explains how the latter aims, through routine inspection of the nuclear material in the facilities and through complementary access, at extending the existing control activities to nuclear material used for R&D programmes and to the manufacturing and export of equipment potentially usable for unknown nuclear purposes.

Klaus-Jürgen Röhlig

Deputy Head of Final Storage Department, GRS (Germany)

***"The idea of gathering experts from different technical support organisations** to exchange on selected nuclear safety issues is valuable, as it gives a frame for technical collaboration. Frankly speaking, present EUROSAFE Forum's seminars enable peer reviews to be summarised, but not to be carried out, and I think it could be useful to take these seminars as an opportunity to encourage and initiate peer reviews aimed at strengthening technical collaboration on common subjects.*
It would be a powerful leverage to increase confidence into systems, methods and tools. I also think it would be suitable to have a stronger presence and involvement of non-TSO regulatory bodies. The first reason is that the work performed by the TSOs is carried out on their behalf. The second is that the extent of the possible technical collaborations is depending on the respective regulatory context in each country."

> Implementing the physical protection of nuclear materials

In France, approximately 270 facilities holding nuclear materials are operated and classified in three physical protection categories. As an IAEA Member State, France actively shares its experience of the steps to be taken when a discrepancy is discovered between the physical inventory listing and accountancy records of any of these facilities. The procedure aimed at understanding the causes of the problem and preventing any other occurrence of this kind of event is described in the paper titled *Nuclear material discovery or loss: the French experience*. The licensee, for instance, has to set up appropriate means and procedures such as the modification of documents (procedures, modus operandi, record forms…) or software, personnel information and training, etc. in order to solve the problem and avoid any other occurrence.

> From Kananaskis to St. Petersburg: new initiatives involving enlarged membership

At the Kananaskis Summit in June 2002, G8 leaders launched the Global Partnership (G8GP) against the spread of weapons and materials of mass destruction, committing themselves to support non-proliferation, disarmament, counter-terrorism and nuclear safety in the Russian Federation. The GRS paper titled *Implementation of the G8GP Program on Physical Protection – Experiences and Results* reports about this programme: implementation, experience gained, current achievements and results. It also mentions the announcement, at the G8 Summit in St. Petersburg, in July 2006, of the Global Initiative to combat nuclear terrorism. In addition to all G8 countries, Australia, China, Kazakhstan and Turkey are invited to join this new initiative co-chaired by Russia and the USA. It is aimed at providing technical and applicatory support to countries which request such support and commit to the 8 principles of the Global Initiative. ■

JS3P: CONCRETE PROJECTS TO SHAPE THE COMMON FUTURE OF TSOs

■ Within 3 years, the *Junior Staff Programme* (JSP) officially launched at the EUROSAFE Forum held in Paris in 2003 [1] grew up with strength and consistency. Designed as a GRS-IRSN joint initiative aimed at enabling both TSOs to eventually carry out together an increasing number of tasks, the Programme, which started with a staff of 9, now gathers 25 members from GRS, IRSN and AVN, their Belgian counterpart who has joined the European TSO Network in the meantime [2]. The EUROSAFE Tribune met them for an update at the EUROSAFE Forum in Paris.

To help the 25 JSP members prepare for long-lasting work of common interest to be performed jointly in either institution, it appeared necessary, as a first step, to schedule activities meant for networking their scientific, technical, cultural and personal acquaintances. The first two years (2003-2004) were thus devoted to gaining sufficient knowledge and experience of the members' respective institutions and specialities through three major types of activities: firstly, an "experience feedback"-type review of the programmes carried out jointly by GRS and IRSN; secondly, the identification of a new programme eligible for increased co-operation and thirdly, the promotion of joint training activities. During the 2005 EUROSAFE Forum held in Brussels, the JSP members decided to split the aforementioned activities into pilot projects named *Junior Staff Programme Pilot Projects* (JS3P). Those were selected depending on their ability to translate into concrete results within a limited period of

time (12 months max.), thus keeping momentum and providing the managers of the institutions involved with a clear view on the work in progress. It was also decided to give projects a framework to allow each JSP member to simultaneously conduct JS3P activities while working further on his/her own business in his/her respective institution.

> Opening up

"The prioritised projects mostly pertain to technical issues so as to meet the needs of our institutions. Nevertheless, we could envisage to embark on non-technical projects as well", Nathalie Sentuc pointed out. Indeed, cultural or sporting activities contribute to an increased exchange of staff, thus supporting further integration among AVN, GRS and IRSN.

The goal set to JS3P is to produce 'co-signed' work results – e.g. reports, publications, etc. – as the outcome of short-time missions performed jointly in either institution. *"We are presently working on such projects as bibliographical research and scientific surveys, and we are thinking, in the meantime, of joint projects to be carried out eventually. To get the system into shape, we suggested to prioritise projects with little risk and financial impact"*, Olivier Smets advocated.

Beyond the current four projects, the JSP members set the 2007 EUROSAFE Forum to be held in Berlin in November as a deadline to validate the JS3P approach. *"Each project is approved by a management board, reviewed by members from each institution and steered by a technical steering committee"* Hugues Prétrel explained, adding: *"For the future, we consider proposing pilot projects with both non-technical and technical backgrounds. Those may deal with fires associated with equipment failures or kerosene, with reactor safety - with a joint analysis of the accident at the Paks NPP- (Hungary) or with radiological protection with a comparison of concepts of systems for radiological environmental surveillance in the vicinity of nuclear power plants."*

> *Intuitu personae*, the basis of responsiveness

"Whatever topic is selected, achieving a certain degree of intuitu personae *is key to the success of the project. This is why we need to work side by side for a couple of consecutive days and create a relationship propitious to pacing up our activities also through direct, informal links"*, Sven Michael Keesmann concluded. ■

(1) See the EUROSAFE Tribune #05.

(2) At the 2005 EUROSAFE Forum in Brussels.

EVENTS & WEBSITES

UPCOMING EVENTS

➤ *9-13 September 2007 – Boise, Idaho (USA)*
GLOBAL 2007, Conference on the future nuclear energy systems with special emphasis on their associated advanced fuel cycles.
Organised by the American Nuclear Society
Contact: Karen Howden, E-mail: karen.howden@inl.gov
Website: http://www.ans.org/meetings

➤ *13 September 2007 – Paris (France)*
Les déchets de l'assainissement et du démantèlement des installations nucléaires (in French)
Organised by the French Nuclear Energy Society (Société française d'énergie nucléaire, SFEN)
Contact: Michèle Le Goff, Phone +33-1 53 58 32 15,
E-mail: mlegoff@sfen.fr

➤ *16-20 September 2007 – Brussels (Belgium)*
European Nuclear Conference - ENC 2007
To be addressed among other topics: the nuclear fuel cycle (including waste, transport, dismantling and partitioning & transmutation); socio-economic, political and ethical considerations.
Organised by the European Nuclear Society
Contact: Kirsten Epskamp, Phone +32-2 505 30 54,
E-mail: enc2007@euronuclear.org
Website: http://www.enc2007.org

➤ *8-12 June 2008 – Anaheim, CA (USA)*
2008 International Congress on Advances in Nuclear Power Plants (ICAPP '08)
Embedded International Topical Meeting at the 2008 ANS Annual Meeting
Contact: Lynne Schreiber, Phone +1-352-392-9722,
E-mail: icapp@ans.org

USEFUL LINKS TO READ MORE ABOUT RADIOACTIVE WASTE MANAGEMENT

➤ A comprehensive web portal devoted to radioactive waste technology and management:
http://www.radwaste.org/

➤ **Public Information, Consultation and Involvement in Radioactive Waste Management: An International Overview of Approaches and Experiences**
Available online at: http://www.nea.fr/html/rwm/reports/2003/nea4430-publicinfo.pdf

➤ **Learning and Adapting to Societal Requirements for Radioactive Waste Management – Key Findings and Experience of the Forum on Stakeholder Confidence**
Available online at: http://www.nea.fr/html/rwm/reports/2004/nea5296-societal.pdf

➤ Other documents produced by the NEA on the radioactive waste management issue are accessible at:
http://www.nea.fr/html/trw/index.html

➤ Information on the current EC Programme Activities (*) for the Management of Radioactive Waste is available online at: http://ec.europa.eu/research/energy/fi/fi_cpa/waste/article_2517_en.htm

(*) ACTINET-6, COWAM-2 ESDRED, EUROPART, EUROTRANS, FUNMIG, NF-PRO, RED-IMPACT, SAPIERR.

The EUROSAFE Tribune #12
will deal with Probabilistic Safety Assessment

The EUROSAFE Forum 2007
will take place in Berlin
on 5 & 6 November
(at Maritim proArte Hotel Berlin).

The corresponding debates and seminars will be reported in the EUROSAFE Tribune #13

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Towards Convergence of
Technical Nuclear Safety Practices in Europe