



European Nuclear Society
e-news Issue 5 Summer 2004

In this issue

This summer edition of ENS News takes on a celebratory theme as 50-year nuclear anniversaries are marked in various parts of the world. These events provide an important opportunity both to appraise and take stock of the past, freeing the space for informed projections for the future.

Continuing in an analytical vein in this issue, there is an insight into the challenges of the future of the European Nuclear Industry in a context of rapid change from ENS President, Bertrand Barré. On the R&D front, you will find a report on the Belgian Nuclear Society's roundtable entitled "Nuclear R&D in Europe: status and future".

This period of reflection is compounded by the lightness in spirit at this time of year, as we all unwind before the autumn. In this spirit, you will find an ENS News that is somewhat reduced in volume, quality not quantity being of course at the top of our concerns!

The ENS General Assembly in Vienna provided the summer's sounding board for ideas, and we hope this issue will provide ideal material for pondering thoughts at this time of relative quiet.

Wishing you a very restful holiday,

Peter Haug
Secretary General

Andrew Teller
Editor-in-Chief

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/dubrovnik.htm>

ENS NEWS
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Dubrovnik, May 17, 2004

Speech by ENS President Bertrand Barré

The Future of the European Nuclear Industry



Bertrand Barré

Dear Colleagues,

ENS, as you know, has always pioneered Europe's enlargement. The European Union reached 25 members this month, and I have no doubt that Croatia will join in the near future. However all new entrants to the European Union were part of ENS long before accession, and also non-European Union countries, including Russia and Israel are among our member societies...

I really believe the times are propitious for nuclear power. The price of a barrel of crude oil has hit the \$40 mark once again: it may be temporary, but more and more reputable geologists predict that world oil production is going to peak within 10 to 15 years. It should be a rather flat peak, followed by a very slow decrease, but this would create an enormous pressure on natural gas, the most likely substitute to oil and presently nuclear power's fiercest competitor. There is no predicting what the prices of oil and gas will be in the next 2 decades.



By contrast, we know that the costs of nuclear power will remain very stable, as they hardly depend upon the prices of the resources. Uranium accounts for less than 7% of the total kWh cost, versus more than 60% for gas. But even if the big oil and gas crisis is farther away than I believe, we are facing a major dilemma **today**:

1. We need more energy for the developing world, including such giants as China, India and Brazil. We should not forget that some 2 billion people currently have no access to electricity. Furthermore, the 6 billion people inhabiting the Earth today will rise to 9 billion around the year 2050.
2. There is a clear and urgent need to cut our emissions of greenhouse effect gases (GHG); mostly, but not only carbon dioxide. In a mere half-century, we have already doubled the maximum CO₂ level ever known to man before in our atmosphere. This is a documented scientific fact, covering a period of 600 000 years.

3. Out of the 10 billion tons of equivalent oil we consume each year, 80% actually comes from the combustion of fossil fuels, which constitutes the main source of anthropogenic CO₂ releases to the atmosphere.

Solving this triple equation may be the toughest challenge we must meet in this half century:

- It is a formidable challenge even with a significant increase in the share of nuclear power, which supplies today less than 7% of the world's primary energy;
- It would be an almost impossible challenge without nuclear power.

But, fortunately, the general atmosphere is improving on the nuclear scene:

- Asia forges on with its programs (Japan, South Korea, China, India, Taiwan...)
- In the USA, where utilities are rushing to obtain the authorization to extend the lifetime of their existing reactors, there are signs that new orders might not be too far away.
- The Russian Federation is awakening from the hibernation that followed the Chernobyl accident and the breakup of the Soviet Union.
- Europe alone keeps sending conflicting signals, however, the most recent are positive. In Switzerland, two antinuclear referendums were comfortably defeated. Preliminary works have started on the Olkiluoto site in Finland, where the European Pressurized water Reactor EPR supplied to TVO by AREVA and Siemens will be built (I was there last week, and it is indeed heartening to again witness an active nuclear construction site in Europe). Also, the French Prime Minister announced last month that the government will authorize EDF to order another EPR to be built in France very soon.

There is no doubt that big nuclear plants, such as the EPR or ABWR, promise competitive production of baseload power, and are much more predictable than their fossil competitors. However, what about smaller plants for smaller grids? Can smaller plants be competitive for electric power alone? Are the prospects better for combined heat and power, or desalination and power? Honestly said, the jury is still out. This is why today's conference "Nuclear Option in Countries with Small and Medium Electricity Grids" is very interesting. It should shed a useful light on a very topical issue.

Looking further into the future, in the framework of Generation IV and INPRO, specialists are trying to identify or design better nuclear systems for future decades. Revisiting the breeder options for sustainable generation, considering hydrogen production to access the transportation sector without GHG emissions, etc.

Nuclear power is just 50 years old, as we shall celebrate next July in Obninsk. It is therefore a very young technology with a bright future if we, fellow nuclear scientists and engineers, make it happen together.

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/general-assembly-0604.htm>

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ENS General Assembly in Vienna, 25 June 2004



The Summer 2004 ENS General Assembly took place in Vienna on Friday 25 June. Organised with the kind assistance of the Austrian Nuc Soc and in particular its president, Helmut Böck, it got off to a fine start on the preceding evening, with a typical Viennese “Heuriger” dinner on the outskirts of the city.

The 24 participants had the pleasure of congratulating Michael Grave as the winner of the 2004 Jan Runermark award, which he received

with an enlightening speech on his successful efforts to promote the YGN in the UK. The full speech and details of Mr Grave and his work are available on the [ENS website](#).

The General Assembly progressed well, following the set agenda; the minutes of which will be posted on the web site (members' pages) in due time. A noteworthy, positive development was the confirmation of the re-admission of the Yugoslav Nuclear Society to the ENS. Thus re-establishing ENS as an organisation comprising 24 national nuclear societies.

The Austrian Nuclear Society, furthermore, seized the meeting as an opportune moment to issue a press release underlining the increased importance of nuclear energy in the enlarged EU in terms of climate change.

All told, Vienna provided the location for a positive and fruitful exchange of views.

The next ENS General Assembly will be held here in Brussels on 24 November 2004. This will permit co-ordination with Foratom, during a very ‘nuclear-oriented’ week, which will feature both ENS and Foratom General Assemblies, plus a joint Foratom-ENS workshop (on 24 November 2004, starting at 6 p.m.), not to mention the European Nuclear Assembly (ENA) which will take place on 25 – 26 November.

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/50-years.htm>



Listening to others: a personal view by Andrew Teller, ENS society manager

50 years: the beginning of the end or the end of the beginning?

Fifty years of peaceful uses of nuclear energy have given rise to several celebrations the world over. Beginning in 2003 with the « Atoms for Peace » initiative, 2004 has seen two further events to commemorate the milestone. First, the American Nuclear Society is celebrating its fiftieth anniversary throughout the year, and also the first Russian civil nuclear power plant at Obninsk was commemorated at the beginning of July in an event co-sponsored by the IAEA and the Russian Nuclear Society. It is worth noting that no similar events seem to have taken place for fossil-fired power generation when these reached similar milestones. Several reasons may account for this difference. The beginnings of the world's latest energy resource were precisely recorded, making it easier to pinpoint anniversaries than for other fuels. These beginnings also marked an about-turn in the way the power of the atom was to be used, shifting from military to civil applications. In any case, one cannot help thinking that these celebrations implicitly acknowledge that nuclear energy is not quite like the others. This observation is not meant to belittle its role: the celebrations also serve to remind everybody that the advent of a nuclear age was, at the time, expected to provide a sustainable answer to mankind's growing energy needs. Fifty years later, following some initial oversell and systematic distrust ever since, this possibility is still alive.

“Fifty Years of Nuclear Power – the Next Fifty Years”: read the title of the Obninsk conference. The very title would infuriate the critics of nuclear energy who have been campaigning to phase it out well before another fifty years pass . It is therefore useful to have a closer look at nuclear power's life expectancy. This leads us to examine two claims often made by the opponents of nuclear energy: a) uranium reserves are insufficient to guarantee its long-term use and b) the technology is obsolete.



Let us first address the often-disputed issue of the world's uranium reserves. The NEA “Red Book” puts known conventional resources at 4.6 million tons of uranium.

This is the most commonly accepted figure. It has been picked up by sceptics to conclude that nuclear power generation (NPG) would be short-lived, especially if installed capacity were to grow, and hence not worth the trouble. A recent survey of the situation was presented at the Obninsk conference by D. Grenèche (AREVA, France). To summarise his detailed study in two sentences:

- the world's ultimate resources of uranium including speculative and non conventional resources (except uranium from sea water) could be in the range of 35 millions tons
- assuming a healthy but realistic growth of NPG with thermal reactors only, these reserves would be able to fuel reactors until the end of this century. Full recycling of fissile materials (reprocessed U and Pu) in thermal reactors would allow to extend the utilisation rate of natural uranium by a few tens of percentage points.

Where does this assessment place NPG in relation to other energy sources? Well, the answer is, perhaps surprisingly, not far from the position of fossil energy sources. History is especially informative in this respect. It reveals that there has been a gradual change over the past five hundred years in the energy mix used by Man, at least in the western world. Wood was progressively replaced by coal. In England the transition started as early as the 16th century. Oil entered onto the scene in the beginning of the 19th century, and was well implanted by 1850. The expansion of the use of natural gas began around forty years ago, with the effect of reducing the use of oil in many applications. Limited gas and oil resources allow for the prediction that their expanded use will be followed by a decline later in this century. If our energy consumption rate is not to be drastically reduced, oil and gas will have to be replaced in turn by new energy sources. Renewables, fission (with or without a closed cycle) and fusion are the only CO₂-free candidates at present, although with very different technical potentials. Hydrogen is not included in this list, as it is only an energy carrier.

This short summary of five centuries of western history leads to the following observation. People's energy needs have long been met by successive waves of different fuels, the general trend being from solid to liquid to gaseous, with a steady decrease in the carbon content. More importantly, nuclear's potential life expectancy without fast breeders would be in the range of 150 years, which is not much shorter than oil and gas. With fast breeders it would actually exceed the lifetime of coal.



So much, then, for the limited resources. Let us now turn to the question of obsolescence. It is a favourite claim of the opponents of nuclear energy that the current generation III or III+ reactors are only the latest embodiment of an antiquated

technology dating back to the fifties. If this thinking were applicable, it would also be true to say that today's cars should be dismissed as the latest embodiment Ford's T-Model. Those who say so ignore decades of R&D and systematic use of experience feedback. Reviewing anti-nuclear literature sometimes helps to highlight the weakness of their arguments. In one pamphlet, the French Greens explained that energy production technologies should be evolving as quickly as is currently the case with Information Technology, where all new advances are immediately implemented and brought to the market place. In another pamphlet, the same Greens state that in order to conserve energy, appliances should be designed to last for as long as possible. On the basis of such conflicting signals, it is impossible to decide whether laptops should be built to last or not. One is also left wondering why power plants should not likewise be designed for the long run, given the large energy investment their erection represents. The Greens' ambivalence regarding plant design lifetime does not, however, stop the nuclear community from investigating other avenues for NPG. This is clearly the goal of the Generation IV initiative, but this project should in no way be seen as implying that the current technologies are wanting.

Based on this evaluation, I conclude that there are no reasons to expect a premature death of NPG due either to the exhaustion of the required fuel resources or to technical inappropriateness. All told, the organisers of the Obninsk conference might well have titled their conference "the Next Hundred Years". They were probably wise, however, not to do so: so many things can happen in one hundred years.

¹ The phasing-out time-scales advocated by the opponents of nuclear energy vary noticeably: five years from the date the decision is taken (when they are in the opposition), rising to twenty years or, at any rate, after the first milestone of the Kyoto protocol, when they are part of a government.

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/rrfm2005.htm>

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Research Reactor Fuel Management, RRFM 2005

Topical meeting on Research Reactor Fuel Management (RRFM): Simply unmissable!

Deadline for submission of papers for RRFM 2005 is October 1st, 2004



With a turnout of 174 participants from 24 countries, the 8th International Topical Meeting on Research Reactor Fuel Management – **RRFM 2004** - held in March earlier this year was resounding success, just like its predecessors. **RRFM** has become an unmissable event in the field of the research reactor fuel cycle ever since its first edition in 1997. The two-day conference offers researchers and decision-makers a forum to exchange state-of-the-art information on all significant aspects of the fuel cycle of research reactors.

Preparations for the 9th conference on 10-13 April 2005 are already in full swing. **RRFM** continues to follow the latest developments - also politically! It is now moving to Central Europe for the first time, following the pattern of EU enlargement. The brand-new Hungarian member of the European Union will host the 2005 conference. The splendours of its capital Budapest, aptly called the Pearl of the Danube, will delight you after conference hours.

The conference programme will focus on four main areas:

- international topics and education
- fuel development, qualification, fabrication and licensing
- reactor operation, fuel safety and core conversion
- spent fuel management, back-end options and transportation

Alongside the invited presentations, a great number of programme slots are reserved for contributions from delegates. Don't hesitate to share your ideas and challenges with the RRFM audience by proposing an oral or a poster presentation! The deadline is Friday, October 1st. You will find the Call for Papers on <http://www.euronuclear.org/meetings/rrfm2005/callforpapers.htm>.

Last but not least, RRFM 2005 will feature an industrial exhibition, providing a perfect, targeted platform for your company to display its services and reinforce its market position. The exhibition will be conveniently located in the conference foyer and guarantees maximum visibility and networking opportunities. For further details, please refer to <http://www.euronuclear.org/meetings/rrfm2005/exhibition.htm>.

The preliminary conference programme and registration form will be available from mid-November on www.euronuclear.org. In the meantime, mark your calendar and spread the word!

<http://www.euronuclear.org/library/public/eneews/ebulletinsummer2004/pime2005.htm>

ENS EVENTS
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PIME 2005

**Public Information Media Exchange (PIME):
Defining tomorrow's vision of nuclear**

Deadline for contributions: 8 October 2004

Just in case you have not yet heard of **PIME** - it is THE annual meeting point of public information specialists active in the nuclear energy field. France, home to a dynamic nuclear industry of global importance will host the next **PIME** in Paris from 13-16 February 2005.

There is no other conference like **PIME**. It is a unique opportunity to hear first hand about the PR experiences of the major companies and international organisations involved in nuclear energy: fresh perspectives, resounding successes or failures, daring initiatives or surprising new approaches to familiar issues - plus a varied line-up of invited speakers. The **PIME** programme is always stimulating and creative, offering something of interest to both newcomers and old-timers!

Building on an already solid base, the 2005 conference will at the same time be different to previous **PIMES** in certain important respects.

- The aim is to have greater input than before from non-nuclear communicators – from NGOs, the media and academia, for instance.
- **PIME 2005** will be more interactive than ever before, the plan being to have 'hands-on' and smaller workshop sessions, with less time being devoted to presentations during plenary sessions.

The third day of the conference will be entirely dedicated to the French experiences in communications, making the most of the knowledge of the host country. As always, the conference will be concluded with a technical tour - with France's variety in nuclear installations, you can be sure of a highly interesting excursion.

PARIS

Maison de la Chimie

13 - 16 February 2005

The Preliminary Programme will be available from mid-November on www.euronuclear.org. If you have a story to tell, don't hesitate to propose a presentation and be part of the next **PIME!** The deadline for contributions is 8 October 2004. You will find the Call for Papers on www.euronuclear.org/events/pime/pime2005/pime2005.htm.

PIME is simply a must for nuclear communicators, whether you wish to be a delegate or a presenter. Don't miss this opportunity and mark your calendar right now. We look forward to welcoming you in Paris!

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/R&D.htm>

MEMBER SOCIETIES

"Nuclear R&D in Europe: status and future"



This was the subject of a roundtable organised by the Belgian Nuclear Society on Thursday 17 June 2004.

The discussion panel was composed of:

- Prof. Michel Giot, Professor at UCL and SCK/CEN Vice President,
- Mr. Dominique Hittner, AREVA FANP Project Manager,
- Mr. Jacques Pirson, Tractebel R&D,
- Mr. Roland Schenkel, JRC Deputy Director;

The moderator:

- Mr. Claude Truffin, ULB R&D Director and SCK/CEN Managing Director.

Industry representatives (Messrs Hittner, Pirson) provided the industry perspective on the question by describing the actions of their respective companies in the field of R&D.

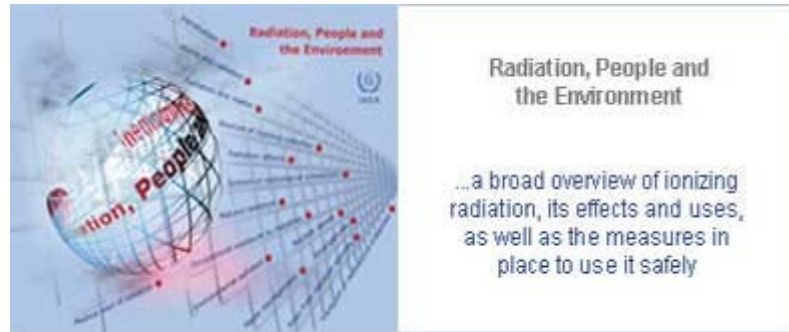
Prof. Giot focused its contribution on an analysis of the threats and opportunities faced in particular by the nuclear sector. R. Schenkel then raised the topical issue of whether the nuclear sector was experiencing the end of a period of transition. He was keen to emphasise that, from his point of view, a more positive attitude was now surfacing in Europe, as suggested by recent newspaper articles. He considered that three conditions had to be fulfilled to confirm this trend. The continued industrial leadership is essential, he noted, as is closing the nuclear cycle, which enters the domain of governmental responsibility. Last but not least, he added that scientific leadership needs to be achieved. Here, the universities have a large and highly influential role to play. He went on to underline EC promotion of coordination and integration of R&D efforts, and the inducement of joint strategies between industrial players and the EC. He also recommended investing more in new energy fields to attract young scientists.

The panel's discussion revealed two consensus points. First, the vital point of building confidence in the nuclear community and the public was highlighted; it was suggested that R&D might have a role to play in answering this question. Second, shaping nuclear R&D in the future should - in order to maximise productivity - be done in the context of an ERA (European Research Area).

The moderator, Mr. Truffin, concluded with a statement underlining the need for the nuclear community to demonstrate more assertiveness, as the future for nuclear R&D is bright indeed.

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/iaea-radiation.htm>

ENS WORLD NEWS NEWS



The IAEA has just published a concise (80 pages) and accessible book entitled 'Radiation, People and the Environment'. Full of illustrations, it is dedicated to introducing the reader to the theme of radiation and the different ways it affects our world, including its uses, potential dangers and how we can maximise safe usage.

The publication has its own website:

<http://www.iaea.org/Publications/Booklets/RadPeopleEnv/index.html>

It can also be downloaded in pdf format from:

http://www.iaea.org/Publications/Booklets/RadPeopleEnv/radiation_booklet.html

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/nuclear-waste.htm>

ENS WORLD NEWS NEWS



'Nuclear Waste: A Technological and Political Challenge', is the title of a book recently published by Springer, written by Piero Risoluti. This 143-page edition endeavours to pinpoint the origin of the negative public perception of nuclear energy - and in so doing highlight the information gap which exists - by introducing the significant worldwide technical achievements in nuclear waste disposal.

The contents are as follows: 'The Problem. – A Special Energy and Its Enemies. – Before and After Chernobyl. – Technical Issues. – Nuclear Waste and Democracy.'

The book costs EUR 69.95 (excl. VAT)

To pick up a copy contact: orders@springer.de

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/nucnet-news.htm>

ENS WORLD NEWS NEWS

NUCNET NEWS

Japan's Tepco Predicts Increased Nuclear Share Following Fiscal 2003

Tokyo Electric Power Co. (Tepco) says that while nuclear plant suspensions contributed to the rise in fuel costs for thermal power generation last year, those costs are expected to fall – through an increase in the share of electricity generated by nuclear power – the company reported in its recently released financial results for fiscal year 2003.

Those suspensions of nuclear plant operations in the spring of 2003 followed allegations concerning the falsification of inspection records (see Business News No. 22.2, 15th April 2003). Tepco's 17 reactors units – six at the Fukushima I nuclear power plant, four at Fukushima II and seven at Kashiwazaki Kariwa – began returning to service soon afterward (see News No. 170, 16th May 2003). As of 30th April, 12 of the Tepco units were operational. According to the operating records of Japanese nuclear power plants in May, Tepco's Fukushima I-1, Fukushima I-6, Fukushima II-2, Fukushima II-4 and Kashiwazaki Kariwa-2 remain shutdown due to periodic inspection.

In the fiscal 2003 results, Tepco reported a net income of 149.5 billion Japanese yen (JPY) (1.37 billion US dollars), representing a 9.5% decline from the previous fiscal year (see Business News No. 29, 29th May 2003). Tepco's volume of electric power sold during fiscal 2003 also declined from fiscal 2002 due to decreases in air-conditioning demand caused by an unusually cool summer and mild winter, as well as to the sluggish demand for industrial use caused by a slump in production activities. The total electricity sold by Tepco fell by 2.1% from the previous year to 276 terawatt hours (TWh).

On expenses, the company said that while: "Suspensions of nuclear power plants continuing into fiscal 2003 sharply pushed up the fuel costs for thermal power generation, on the other hand Tepco worked hard to further improve efficiency and cut costs across the entire range of operations ... (and) Tepco was able to reduce ordinary expenses by 2.1% from the preceding year to JPY 4.57 billion."

Looking ahead, the fiscal 2003 report reads that despite the anticipated increase in nuclear-related repair expenses and the heavier burden caused by an advance on the price of crude oil, Tepco estimates that electric power sales will increase by 2.2% and that the company expects to register a net income of JPY 265 billion in fiscal 2004. The report concludes: "Tepco expects to achieve these figures on the basis of an estimated reduction in fuel costs resulting from an increase in the share of electricity generated by nuclear power, and by continuing to promote comprehensive measures to improve efficiency and reduce costs."

An English-language summary of Tepco's financial results for fiscal 2003 is available through the company's website (<http://www.tepco.co.jp>).

Source: Tepco / Japan Atomic Industrial Forum (JAIF)

Editor: Daniel MacIsaac

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Civic Leaders Promote New Dutch Research Reactor

The local council in the Dutch municipality of Zijpe - home of Europe's Petten research reactor - is urging that a replacement be built when the current reactor reaches the end of its operational lifetime in around 2015.

The council expressed its support for a replacement for the European Commission-owned high flux reactor in a meeting called to discuss future prospects for the municipality - details of which were reported in the 8th July edition of one of the biggest regional newspapers in The Netherlands, the "Noordhollands Dagblad".

Last year, an independent study by a Dutch government committee showed that a halt in operation of the Petten reactor of more than a month would lead to shortages of at least two medical isotopes, "affecting patients all over Europe".

Source: Noordhollands Dagblad / Various

Full report: NucNet News in Brief No.8, 12th July

<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/member-societies.htm>

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<http://www.euronuclear.org/library/public/enews/ebulletinsummer2004/Corporate-Members.htm>

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