European Nuclear Society
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In this issue

By the time this edition of ENS News reaches you across the ether you may already be warming yourself on a sandy beach or chilling out by a pool in some exotic location. Yes, it's that time of year again, when thoughts switch from all things nuclear to other, more relaxed ways of creating and consuming energy – or saving it as the case may be. Well, before the ENS News team reaches for the sun tan lotion and the Immodium (where's that on Mendeleyev's table?), here is the last news offering before the summer break.

Issue N° 9 reaches far across time and space, from World War II Chicago, via Gabon, to when our planet was created around 2 million years ago. ENS President, Bertrand Barré, travels back in time and across continents to trace the history of fission and provides some 21st Century answers to questions that are rooted in the mists of time.

Bertrand's journey starts in 1942 Chicago, when Enrico Fermi succeeded in sustaining the first ever fission chain reaction in the first ever man-made nuclear reactor, the CPI. For decades after Fermi's ground-breaking achievement, it was believed that the CPI was not just the first ever man-made reactor, but the first ever nuclear reactor – full stop. Bertrand turns the clock back over 2 million years to the time when algae first released enough oxygen into the atmosphere for surface waters to become oxidizing. Once this happened the uranium diluted in granite was leached out and concentrated to form rich uranium oxide deposits. And the rest, as the saying goes, is history. Geological and chemical research has revealed that the first nuclear reaction took place when our planet first saw the light of day. So, the CPI was not the first nuclear reactor, Mother Nature was.

We then move forward, at the speed of light, to the 1970s, when large uranium deposits were first mined at Oklo, in Gabon, West Africa? But this is when the detective story begins. Bertrand's editorial examines why the uranium found in Oklo was different from natural uranium everywhere else. Was the Oklo mine a "natural" nuclear reactor that enriched uranium spontaneously? He provides his answers to the mystery and sheds light on whether or not Oklo was a natural phenomenon that Fermi could never have dreamt of.

Our "Tapping Unusual Quarters" article this time focuses on the issue of sustainability and whether this modern buzz-word that so preoccupies economists, politicians, scientists and environmentalists alike stand sup to scrutiny. Is it just a trendy cliché or is it a genuinely sustainable concept?

The ENS News Events section provides updated information on all the ENS-organized conferences that are looming large in the rear-view mirror.

First up is more news about **ETRAP**, which takes place in Brussels from 23-25 November 2005 and we end the year with the **ENC** (Versailles, 11-14 December). The 2006 calendar features four main highlights, starting with **PIME**, in Vienna, from 12-16 February. The **RRFM** 2006 conference will take place from 30 April-3 May, in Sofia, Bulgaria. Full details are available on the dedicated web pages.

The Member Societies and Corporate Members section features reports from our friends at the German and Romanian Nuclear Societies. CEZ, the Czech Republic's primary nuclear operator then takes the spotlight with the 20th anniversary of the operation of the Dukovany NPP.

The European Institutions section features reports on COWAM 2 (the European Commission-funded "Community Waste Management" programme) and on the work of a special FORATOM Task Force on the Baltic Sea Region, which involved the participation of a number of European Members of Parliament, European Commission officials and national politicians and experts from the Baltic countries, Sweden and Finland.

How often does a co-founder of Greenpeace publicly nail his newly-found pro-nuclear colours to the mast? About as often as a total eclipse of the sun occurs? Well, you'd be surprised; the World News section of ENS News reveals all. "*Green light for Monju*" puts the spotlight on the latest developments in Japan and the section ends with the traditional NucNet news round-up.

Enjoy this, latest edition of ENS News.

Happy Holidays from the ENS News team!

Peter Haug
Secretary General

Andrew Teller
Editor-in-Chief

http://www.euronuclear.org/e-news/e-news-9/presidents-contribution.htm

ENS NEWS

ENS President's contributions

The nuclear Reactors of Oklo: 2 billion Years before Fermi !

Bertrand Barré, President European Nuclear Society

1. "The Italian Navigator has landed in the New World".

On December 2, 1942, this cryptic message announced that the team gathered around Enrico Fermi in Chicago had managed to sustain a fission chain reaction in the first ever man made nuclear reactor, CP1. This was the climax of a decade long search, starting with the discovery by Chadwick in 1932 of the neutron, a particle able to interact with the nuclei without being hampered by their electric charges, the series of experiments by Fermi sending “moderated” neutrons against every nucleus of the Mendeleyev Table, the discovery of the fission of uranium by Otto Hahn, Lise Meitner and Fritz Straßmann in 1938. When the team led by Joliot discovered, a few months later, that 2 to 3 new neutrons were emitted during the fission, they were able to conceptually design a nuclear reactor, a facility using a sustained fission chain reaction to generate vast amounts of energy, but World War 2 shifted the research efforts to America.

And for three decades, it was believed that CP1 was not only the first man made reactor, but the first nuclear reactor ever – full stop.

2. Radioactive Earth.

Not everybody realizes that geothermal energy is just another name to describe the radioactivity of our planet. Among the heavier elements retained during the formation of Earth (most of the lightest elements escaped its too small gravity), a number have only radioactive isotopes. Potassium [1] , Thorium and Uranium are the most abundant remaining today. The energy they keep releasing during their radioactive decay is the central heating system which supplements what we receive from the Sun.

Natural uranium is (today) composed of three major isotopes, ^{238}U (abundance 99.2744%), ^{235}U (abundance 0.7202%) and ^{234}U (abundance 0.0054%). This very precise composition is the same – almost – everywhere on Earth. All these isotopes are radioactive and decay with time, but not with the same speed. The half-life of ^{238}U is 4.51 billion years while ^{235}U decays by half in “only” 710 million years.

Therefore, the relative abundance of ^{235}U increases if we go back in time: at the creation of the solar system, it was close to 17%, and about 3.58% two billion years ago. 3.5% is the level to which we painfully enrich the uranium today to fuel our Light Water Reactors… In the 50s, some authors played with the idea that fission chain reactions could have occurred naturally when the enrichment was so high, but so many conditions would have been required that it seemed far fetched, and there was no evidence left anyway.

3. A Nuclear Detective Story

In June 1972, at the Pierrelatte enrichment plant devoted to Defense Applications, a routine mass spectrometry analysis of UF6 feed material exhibited a discrepancy: only 0.7171% of the uranium in the samples ^{235}U, instead of the magic 0.7202 ! Even though the discrepancy was small, it was so unusual that the French Atomic Energy commission CEA, operator of the plant, started a thorough investigation. First, it was not an artifact: the anomaly was confirmed on several measurements on other samples. Accidental contamination by depleted uranium from the plant itself was then eliminated and so was the use of reprocessed uranium as there was no ^{236}U in the samples. The investigators then traced the anomaly back through all the stages of uranium processing, from Pierrelatte to Malvesi to Gueugnon where the concentrates exhibited the same low ^{235}U concentrations. These concentrates all came from COMUF which operated two uranium mines in Gabon, at Mounana and Oklo, the mill being located at Mounana. Very soon it appeared that all the anomalous ore came from the northern part of the – very rich – Oklo deposit. In some shipments, the level of ^{235}U was as low as 0.44%. Between 1970 and 1972, in the 700 tons of uranium delivered by the Mounana mill, the deficit of ^{235}U exceeded 200 kg, hardly a trifle !

Oklo mine uranium was indeed different from natural uranium everywhere else. Why ?

“Natural” isotopic separation was excluded : if it had produced depleted uranium, where was the enriched fraction ? As soon as August, the hypothesis of very ancient fission chain reactions was formulated, and investigators started to search for fission products (or, rather, the granddaughters of hypothetical fission products. The spectrum of fission products is so distinctive that it constitutes an unmistakable marker that fission reactions have taken place. The presence of such fission products was clearly identified : at some point in the uranium deposit history, it had become a “natural” nuclear reactor. The discovery was duly heralded but many questions

remained. When did the reactor “start”? How long did it “operate” ? How was it “controlled”? The detective story was not finished.

Later on, it was found that there were actually 15 reactor sites in Oklo, and another one in Bangombé, 30 kilometers away from the main deposit.

4. Current answers to some questions about Oklo.

To run a nuclear reactor, you need a high concentration of uranium with a minimum percentage of ^{235}U **2**, you need water to slow down the neutrons **3** and evacuate the calories and you must avoid those elements which absorb neutrons greedily like boron, cadmium, hafnium, gadolinium and other “poisons”. You need also a minimum size (in the case of a deposit, a minimum thickness of the seam) to prevent too many neutrons from escaping from the reaction zone.

It is only around 2.2 billion years ago that the patient work of photosynthesis accomplished by the first algae released enough oxygen in our atmosphere for the surface waters and ground water to become oxidizing. Only then could the uranium diluted in granite be leached out and concentrated before mineralization in places where oxido-reduction would occur. Rich deposits cannot be older. On the other hand, since 1.5 billion years, ^{235}U abundance has decayed below a level which makes spontaneous fission workable. It took a lot of studies, in geology, chemistry and reactor physics to narrow the bracket of time to the present estimated value : the reactions must have started **1 950 ± 30 million years ago**.

The deposits were located in very porous sandstone where the ground water concentration may have been as high as 40%, probably due to the partial leaching of the silica (quartz particles) by the hot groundwater, at a time where, the radioactivity of Earth being higher than today, the thermal gradient underground was probably higher too. During the reactors operation, the water temperature rose significantly, accelerating this “de-silicication” process and, by difference, increasing the concentration in uranium, therefore compensating for its depletion by fission. As a matter of fact, the concentration of uranium in the reaction zones is extremely high, sometimes above 50%, and the higher the uranium concentration, the lower its ^{235}U content. Furthermore, losing its silica, the surrounding sandstone became clay and thus prevented an excessive migration of groundwater and keeping the uranium in place.

From the fine analysis of the spectrum of fission products, we know that a number of the fissions occurred in plutonium, bred by neutron capture in ^{238}U and now fully decayed to ^{235}U since its half-life is only 24 000 years (By the way, so much for the notion that plutonium is “artificial”). This allowed the physicists to calculate that, varying from one zone to another, reactions did take place during an enormous period of time ranging **from 150 000 to 850 000 years !**

The reactors where “controlled” by several mechanisms, the main one being temperature : as the fission power was released, the temperature rose. Higher temperature means both an increase in absorption of neutrons (without fission) by ^{238}U and a decrease in the efficiency of water as a moderator : at a given temperature

level, a level varying with time and the progressive depletion of fissile uranium, the reactions stabilize, as they do in our reactors [4].

By combining geology and temperature considerations, it is now believed that the reactors in the northern part of the deposit operated at **a depth of several thousand meters**, under deltaic then marine sediments. At such depth, the conditions of pressure and temperature were close to those of the Pressurized Water Reactors of today (350 to 400°C, 15 to 25 Mpa), while the southern zones operated at roughly 500 meters deep, with conditions resembling more to those of a Boiling Water Reactor (250°C, 5 Mpa) [5]: even the Oklo designers did not choose between the present fierce competitors !

Even though significant alteration occurred in recent times when the tectonic uprising and erosion brought the reactors close to the surface, and especially when the Okolo Néné River gouged the valley, the heavy elements thorium, uranium and plutonium did not move at all, nor did the rare earths fission products, as well as zirconium, ruthenium, palladium, rhodium and a few others. On the other hand, krypton, xenon, iodine, barium and strontium have moved, but maybe only after a few million years.

5. Oklo as a “natural analogue” of a radioactive Waste Disposal Site ?

Soon after the discovery, and beyond the pure scientific thrill, the nuclear community was very excited by its implications, notably as a “natural analogue” for the geologic disposal of High Level radioactive Waste (HLW).

There is more and more an international consensus that the best way to dispose of HLW issued from the production of electricity by nuclear reactors is to install them, with a proper conditioning and packaging and additional engineered barriers, in a stable underground geologic stratum where the radioactive decay will progressively reduce their toxicity to a harmless level. But this decay takes a long time, and it is quite a challenge to demonstrate the containment of the radioactive products over such a long period of time, ranging from tens to hundreds of thousands of years. It can only be done through physico-mathematical modeling, with the inherent uncertainties associated with the completeness and accuracy of the models and their propagation along the calculations.

There, in Oklo, Mother Nature had contained *precisely the same radioactive elements* not for hundreds of thousands, not for millions, but for a couple of billion years, and without engineered barriers or special packaging.

So much is true, especially for the heavier elements which constitute most of the radiotoxicity of the HLW packages [6]. But the comparison cannot be pushed too far. To use a teenager’s expression, the Oklo reactors are “too much”… If we could find a similar phenomenon one million years old, that would be perfect, but we have seen this is physically hopeless. For instance, most of the migration occurred during the reactions themselves, over close to a million years, when the conditions were far more troubled than what we expect in a steady and cozy disposal facility : the site has been deeply modified, losing by de-silicication three quarters of its substance, minerals have been altered by irradiation, temperature have run high and significant water convection did occur! Let us say Oklo provides a good presumption, but not a demonstration.

6. Conclusion : A unique Phenomenon ?

Let me borrow my conclusion from the foreword by the late Jules Horowitz to the book by Roger Naudet [3] which I have used extensively for this paper : *"It is after all plausible that fission chain reactions might have spontaneously occurred about two billion years ago, during a period of time long enough to provoke locally significant anomalies in the isotopic composition of some elements, notably uranium. What constitutes a miracle is that, despite the upheavals that the Earth surface has undergone since this ancient era, the evidence did survive to our time, in Oklo, to be discovered owing to the watchfulness of the CEA analysts".*

There is no reason to believe that what occurred at lest 16 times near Oklo did not happen anywhere else on the Earth, especially in old and rich deposits like exist in Australia or Canada… but more than three decades after its discovery Oklo remains unique. It remains unique as a geologic curiosity, and it remains unique as a nuclear detective story.

1. ^{40}K in our bones is responsible for half of the radioactivity of our own body, which amounts to about 8000 Bq for an adult.

2. You can operate reactors with natural uranium but only if you use heavy water D2O or very pure graphite as moderator and a specific "heterogeneous" fuel/moderator pattern, like in CANDU and Magnox types. It would be very unlikely to find such pattern in nature.

3. Neutrons emitted during fission move too fast to split easily other nuclei, but if the neutrons can "bounce" off the nuclei of a moderator, this will slow them down and make further fission more likely.

4. Radioactive decay of some absorbing fission product also played a role over such long periods.

5. If the operating time was immense, the power density in the « core » was only one millionth of its value in a commercial reactor today.

6. They have been retained within the UO2 crystallites themselves

A few References

The Discovery (September 1972)

[1] R. Bodu et al. Sur l'existence d'anomalies isotopiques rencontrées dans l'uranium du Gabon. CR Académie des Sciences Paris 275 D p.1731

[2] M. Neuilly et al. Sur l'existence dans un passé reculé d'une réaction en chaîne naturelle de fissions dans le gisement d'uranium d'Oklo (Gabon) ibid. p.1847

Synthesis

[3] R. Naudet OKLO : Des réacteurs nucléaires fossiles. Etude physique. Eyrolles, Paris, 1991

Selected Websites

www.wonuc.org/nucwaste/oklo.htm (with many interesting links !)

www.science.uottawa.ca/est/eng/prof/clark/EVS%203101/nuclear/ OKLO%20REACTORS.ppt (PowerPoint™ presentation – I have used part of it)

www.world-nuclear.org/info/printable_information_papers/inf78print.htm (all about uranium)

www.ans.org/pi/np/oklo/

www.energethique.com/notions/oklo.htm (in French)

www.curtin.edu.au/curtin/centre/wairsc/OKLO/index.shtml (good synthesis)

www.ocrwm.doe.gov/factsheets/doeymp0010.shtml (Oklo and HLW disposal)

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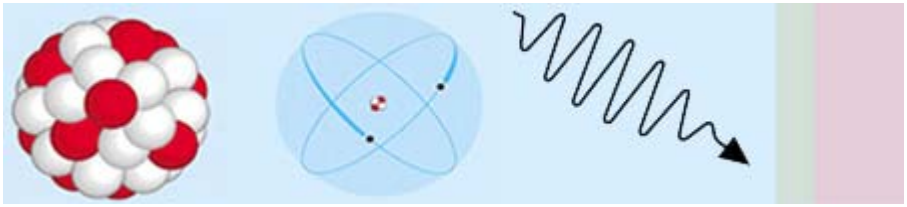
http://www.euronuclear.org/e-news/e-news-9/listening.htm

ENS NEWS



Tapping Unusual Quarters: a personal view by Andrew Teller, ENS society manager

Unsustainable sustainability

Quite frankly, if there are two words I cannot stand, they are the ubiquitous “sustainable” and “sustainability”. Every report and every newspaper or magazine article that purports to deal with the future of our planet is peppered with references to these two words. They have acquired such a capacity for triggering positive knee-jerk reactions from any audience that no issue, however loosely connected to the environment, can be discussed without invoking them. Even the nuclear industry has fallen prey to their fashionable appeal. They have become the ultimate paradigm of politically correct thinking.

The reason for the wrath which the “S-words” awake in me is twofold. Firstly, I object to the most commonly applied definition of sustainability. Secondly, I object to the wrong way that they are used in practice, regardless of the definition applied. Let me approach these two issues in the reverse order. Since the poor use that is often made of the S-words is not critically dependent upon their definition, I shall leave the more important issue of definition to the end.

There are two main ways in which the S-words are misused. The first one is using the word “sustainable” as if it is a synonym for lasting, which is not the same thing at all. I once saw the phrase “sustainable international relations” coined somewhere.

Whatever next, will “sustainable friendship” soon become an accepted concept too?

The second common misuse of an S-word is the habit of confusing “sustainability” with the very slow depletion of resources. So, for instance, geothermal energy is often wrongly branded as being “sustainable.” This is simply not true. The truth is that geothermal energy is used on such a small scale that its supply is not actually affected. However, the same could be said for oil had its consumption level remained the same as that in 1850. While using geothermal energy sources wherever economically feasible is to be commended, calling the process “sustainable” does not exactly encourage clarity. Anyway, enough of these complaints - complaints that are motivated by the engineer’s instinctive need for accuracy. Let’s go back to the problem of definition.

The most commonly understood and applied definition of the S-words is based on the definition of the concept of sustainable development that was provided by the Brundtland Commission. That definition is as follows: “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.”

This laudable attempt at reconciling the idea of development with the fair use of natural resources (at attempt at squaring the circle, perhaps?) unfortunately ends up looking like another classic example of fuzzy thinking. If we think beyond our children’s generation and that of our grand-children, how can we possibly assess, with any degree of accuracy, what more distant generations are likely to require to meet their needs? Even if we could, how could we predict with justifiable confidence that what we have put in place to enable them to solve what we have perceived as their likely future needs will actually correspond with reality? Will our prediction of their needs be consistent with the technology that they will have at their disposal? Clearly, the Brundtland definition rests on a static vision of an evolving world. It encourages one to think of an unlimited future in terms of the present. It will no doubt seem obvious to everyone that the validity of this definition of sustainable development diminishes, inevitably, the more distant the future we focus on. But this is not the end of the story. The Brundtland definition leads us naturally to consider the concepts of renewable and non-renewable energies/resources. Prof. A. Voss observes that “On the one hand the use of renewable energy, e.g. of solar energy, also always goes hand in hand with a claim on non-renewable resources, e.g. of non-energetic resources and materials which are also in scarce supply. And, on the other hand, it would mean that non-renewable resources may not be used at all – not even by future generations[1].” Sustainable development, as defined above, does not provide us with useful guidelines for helping us to understand what renewable and non-renewable energies and resources are. We should stop paying lip service to a concept that does not withstand scrutiny.

Criticism is all well and good as long as it is constructive. A counter-proposal is clearly needed. Firstly, in most cases, we could probably dispense with the S-words altogether and thus avoid the perils of Euro-babble. Secondly, a better definition is needed if we want to emphasize our desire to manage the planet’s resources sensibly. But which definition should we choose? Let’s first recall the guiding principles that should help us in such circumstances:

- We must commit ourselves to using natural resources reasonably, which in most cases means as cost-effectively as possible (life-cycle analyses provide us with the required decision-making tool for achieve this goal

- We must acknowledge that our capacity for predicting the needs of future generations is severely limited; we would be deluding ourselves if we pretended to be able to guess the needs that will arise in, say, three centuries. The time scale for action must be limited if the needs that we identify are to stand the slightest chance of being accurate

- We must rely on the ability of science and technology to provide answers to mankind's needs. This might look like an act of faith to some, but this is exactly what has happened in the past and current trends don't give us any reason to fear a sudden reversal

Interestingly enough, these three principles should be easily grasped by the public. The first principle is uncontroversial. The results of a recent public enquiry on radioactive waste that was commissioned by the French Industry Minister[2] indicate that the public would largely agree with the other two.

The unsatisfactory concept of sustainability could, therefore, be replaced by a more modest but effective one. I support and recommend the wording used by the NEA in its latest report on waste management[3] in which it applies the term "stepwise adaptation". Similarly, sustainable goals would be replaced by "stepwise adaptive" goals. These terms would remind us that the decisions we take have a limited shelf-life and that they will have to be adapted to evolving needs and tools, both of which change in a way that we cannot anticipate. Environmental matters are simply too important to permit the continued use of fuzzy concepts that are applied to help us address them.

1. A. Voss, LCA and External Costs in Comparative Assessment of Electricity Chains - Decision Support for Sustainable Electricity Provision? In Proceedings of an IEA/NEA workshop on Externalities and Energy Policy: The Life Cycle Analysis Approach (pp. 163-181) Paris, France, 15 – 16 November 2001 (can be downloaded from the NEA web site) [Note of the Editor: even the title of this excellent report could not do without a S-word!]

2. P. d'Iribarne, Les Français et les déchets nucléaires, Rapport au Ministre Délégué à l'Industrie, April 2005 (in French).

3. Stepwise Approach to Decision Making for Long-term Radioactive Waste Management, NEA no 4429, 2004 (can also be downloaded from the NEA web site

http://www.euronuclear.org/e-news/e-news-9/etrap.htm

ENS EVENTS

ETRAP 2005

ETRAP2005 promises to be this year's key event for all professionals in the field of radiation protection education and training, offering a stimulating flow of ideas and initiatives.

The enthusiastic response to the Call for Contributions provided 37 oral presentations and an equally large number of posters and educational material displays. Invited speakers and other contributors will give a full overview of education and training needs, strategy, tools, national and international initiatives, and the current state of certification, accreditation and recognition. Keynote speakers include representatives from all major players in the field: the European Commission, IAEA, IRPA, ENEN and ENETRAP.

The conference programme is now online at www.etrap.net/programme.htm.

If you are involved in the science and policy of education and training in radiological protection, register now to book your place at **ETRAP2005**.

ETRAP 2005 Conference Secretariat
www.etrap.net
etrap2005@euronuclear.org

http://www.euronuclear.org/e-news/e-news-9/ENC-2005.htm

ENS EVENTS

ENC 2005

11 - 14 December 2005 Versailles, France

ENC 2005 – The next European Nuclear Conference will be a highlight in the world nuclear scientific and technical community for the year 2005. At a moment when new reactors are ordered, new scientific equipments are implemented, new concerted research programs appear, you are invited to come and meet your colleagues in Versailles, to improve your expertise, to benefit from the experience of the others. This congress offers a complete panorama on what is going on in nuclear power with oral and poster presentations, a large exhibition and exceptional visits of French nuclear sites.

For more information go to:

http://www.sfen.fr/enc2005/

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http://www.euronuclear.org/e-news/e-news-9/pime2006.htm

ENS EVENTS

Make time for PIME!

Bringing together nuclear communications specialists from around the world to share experiences, exchange views and promote communications excellence – that is the aim of **PIME, the annual Public Information Materials Exchange.**

Now in its nineteenth year, PIME has established itself as a not-to-be-missed event for nuclear communications professionals. The secret of PIME's success is the

combination of a thought-provoking programme and an array of experts and speakers representing the industry, international organisations and the scientific community.

The next edition will take place from **12 to 16 February 2006** at the **Vienna International Centre**, one of the four United Nations headquarters and home to the IAEA, a close PIME collaborator.

Dare to share!

Play your part in the success of PIME 2006 by submitting your proposal for a presentation by **15 September 2005**. Share your expertise with fellow communicators and help fashion the nuclear industry's future communications strategy. For further details, please refer to the Call for Papers at www.euronuclear.org/events/pime/pime2006/callforpapers.htm.

PIME 2006 Conference Secretariat
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pime2006@euronuclear.org

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http://www.euronuclear.org/e-news/e-news-9/RRFM2006.htm

ENS EVENTS

RRFM 2006

Mark your diary for the next **Research Reactor Fuel Management Conference (RRFM)**, to be held from **30 April to 3 May 2006** at the **Kempinski Hotel Zografski** in **Sofia (Bulgaria).**

A nine-year success story, the annual RRFM Conference has become a key event for the international research reactor community. RRFM will celebrate its tenth anniversary in the Bulgarian capital, Sofia, a city that provides a fascinating insight into the cultures and peoples of the Balkan Peninsula.

In 2006, RRFM will be bigger than ever before. Its programme has been extended to include an additional half-day session and a new, parallel session on research reactor analysis methods.

Make your own contribution to the success of RRFM 2006 by giving a presentation at the event. Abstracts are welcome and should be submitted by **1 October 2005**. You will find further details in the Call for Papers at www.euronuclear.org/meetings/rrfm2006/callforpapers.htm.

The industrial exhibition organised in conjunction with RRFM offers companies a highly targeted platform to increase their visibility and reinforce their market position. Take this excellent opportunity to meet future and current customers at RRFM and check out the new, flexible conditions at www.euronuclear.org/meetings/rrfm2006/exhibition.htm.

RRFM 2006 Conference Secretariat
www.rrfm2006.org
rrfm2006@euronuclear.org

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http://www.euronuclear.org/e-news/e-news-9/TOPNUX2006.htm

ENS EVENTS

TOPNUX 2006

The British Nuclear Energy Society, supported by the European Nuclear Society, will be hosting the 2006 **Topical Meeting on New Reactor Systems (TopNux).**

"**Securing the Future – The Role of Nuclear**" is the theme of the three day international event in **London** at the **Queen Elizabeth II Conference Centre** from **21 to 23 March 2006**.

The purpose of the conference is to present:

- The role of nuclear energy and the prospects for future reactor systems as part of a diversified energy mix and energy policy
- The experience in various countries in demonstrating operational and economic performance of nuclear power plants, existing and new build and waste management experience.
- An international showcase for reactor designs that are being deployed, near to deployment or being licensed
- Proposed policy options and resolution of issues for new builds
- Longer-term strategies for advanced reactors such as High Temperature Reactors and Generation IV concepts

The conference will bring together senior representatives from governments, industry

and academia from around the world. Many leading global energy industry players and interested politicians will be involved including eminent individuals from outside the nuclear industry.

The speaker list includes:

- Malcolm Wicks, UK Energy Minister
- Kang Rixin, President, China National Nuclear Corporation
- Anne Lauvergeon, Chairman of AREVA
- James Lovelock, UK environmentalist
- Robert van Adel, Chairman of AECL
- Roland Schenkel, Director General of the EU Joint Research Centre
- J.J. Lee, President of Korean Power Utility
- Jim Lake, Director Nuclear Programs at Idaho National Laboratory
- Takeo Fujie, Vice-President of JAPC

Abstracts for poster presentations are welcome. The deadline for submission is **15 September 2005.**

Companies are invited to participate in the industrial exhibition and Reactor Showcase that will be organised in conjunction with TopNux 2006 - a perfect opportunity to reach a highly targeted, high-level audience.

For further information and abstract forms, please contact the TopNux Conference Secretariat:

TopNux 2006 Conference Secretariat
topnux2006@euronuclear.org

Download First Announcement (1.2 MB)

http://www.euronuclear.org/e-news/e-news-9/newsfromgermany.htm

MEMBER SOCIETIES

News from Germany

Wolf-Dieter Krebs KTG 23.06.05

Wolf-Dieter Krebs
Past KTG President and
ENS Board member

KTG Kerntechnische Gesellschaft e. V.

Energy policy has moved back into the center of the political debate in Germany. The composition of the future energy mix is one of the current key topics. The parties supporting the present federal government in Berlin (Socialdemocrats and Greens) heavily lost the last state election in Northrhine-Westphalia in May. In a feeling of resignation Chancellor Schröder is now going for early federal elections this fall, a year earlier than normal. This is quite abnormal for Germany due to constitutional restraints.
The emerging overwhelming election campaign issues are economic slow-down (almost stagnation) and resulting high unemployment rates in the order of 10 percent as well as the reasons for them. High energy, especially electricity prices are strongly claimed by the electricity consuming industry as a major competitive disadvantage. Electricity intensive industries like aluminum smelting plants and basic chemistry are already shifting production abroad. The massive expansion of renewable energies and energy tax increases have more than eaten up the price decrease due to market liberalization. The phase-out of nuclear power as presently fixed by law will de facto start during the next legislative period, only the 350 MWe Obrigheim NPP has been shut down in May 2005.


NPP Obrigheim

The present opposition parties are calling for life extension of the 17 operating NPP and an economically reasonable further support of renewables. A debate on new nuclear power plants is mostly avoided for the time being. But there is a strong demand for immediate completion of the exploration in the Gorleben salt mine for disposal of HAW and for putting into operation the Konrad iron ore mine for non heat producing radioactive waste. What is important: This is openly supported by the state government of Lower Saxony where the two sites are located.

The public at large is mentally split. Only a small minority “wants or likes” nuclear power but a majority of the German population is now convinced that the existing NPP will eventually be operated longer than the phase-out agreement states.

The electric utility industry for the time being lives quite well with the phase-out agreement which allows pretty undisturbed operation of the 17 NPP. However the utilities are facing enormous challenges: Up to 40,000 MWe of new generating capacity must be installed in Germany by 2020. Half of this is the nuclear power being phased out, the other half is fossil power generated by ageing plants which will need to be replaced. In addition a significant upgrade of the high voltage grid will be needed in order to transmit wind power generated in northern Germany to the south. This means immense investments and far-reaching decisions. The key parameter in the utility decision-making process is the political boundary conditions. The utilities demand from any new government a clear definition on a long-term basis and a reasonable weighing of the numerous criteria which steer the energy mix into different directions. This goes far beyond any just national assessment. The media and the public increasingly realize that a sensible energy mix can only be defined by a global assessment. No clear decisions will lead to postponed investments and the bill will have to be paid: Not by the utilities or the politicians but by industrial and private electricity consumers and indirectly by the unemployed, i.e. by the whole nation.

For many years KTG has supported common sense thinking: Don’t put all your eggs in one basket. We need all energy options including nuclear power and only this low cost base load can earn the money needed to develop renewable energies into competitiveness.

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http://www.euronuclear.org/e-news/e-news-9/Romania.htm

MEMBER SOCIETIES

INVITATION AND FIRST CALL FOR PAPERS

ROMANIAN “NUCLEAR ENERGY” ASSOCIATION

International Symposium on Nuclear Energy

SIEN 2005

“Nuclear Power – A New Challenge”

Best Western Park Hotel, Bucharest, Romania
October 23 – 27, 2005

The Symposium organized by the Romanian Energy Association – AREN in co-operation with Association Romanian Atomic Forum - ROMATOM is primarily aimed at experts representing or working for organizations responsible for developing the new nuclear power projects and implementing national Programs.

The Symposium is also open to scientists and students interested in scientific issues on New Challenges of Nuclear Power such as:

- developing the new nuclear technologies;
- finding the possibilities for nuclear Programs developing;
- strengthening public confidence in nuclear power.

The main objective of the Symposium is to analyse the New Challange of Nuclear Power for the next future in context of sustainable development.

Download Call for Papers

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MEMBER SOCIETIES

2005 ANNIVERSARY
20 YEARS OF DUKOVANY NPP IN THE CZECH REPUBLIC

Attachment to Press Release, information material

Twenty years ago Unit 1 of Dukovany NPP achieved 100% of rated power

This year the Czech nuclear industry celebrates the twenty years of the day when the first of the four Dukovany's nuclear reactors was put into operation. The Nuclear Power Plant (NPP) has been operated successfully since its commissioning, as we can infer from the various national and international assessment studies. In this period of anniversary, we ought to remember a few significant dates.

Activity	Date
Start of reactor (first criticality)	12th February 1985
Connection of turbogenerátor 1 to electric grid	24th February 1985
Connection of turbogenerátor 2 to electric grid	25th February 1985
100 % power	26th March 1985
Start of Unit1 test operation	3rd May 1985
Start of Unit1 commercial operation	3rd November 1985

In the first year of operation, Dukovany NPP's Unit 1 produced 2.4 billion KWh (TWh) and reached already 59.7 billion KWh (TWh)by the end of 2004. Such amount of electricity would be sufficient to supply all Czech households at their 2004 consumption level for over 50 months.

In 2004 the Czech Republic's total electricity generation amounted to 84.3 billion KWh (TWh) and the share of Dukovany NPP's four Units was 16.2%. Together with the second nuclear power plant of the country, Temelín NPP, the nuclear share in total electricity production in the CR was 31.2%

About Dukovany NPP

History
The history of the Dukovany NPP dates back to 1970 when the former Czechoslovakia and USSR signed an intergovernmental agreement on the construction of two 1760 MW-nuclear power plants: one at Jaslovské Bohunice in Slovakia and the second at Dukovany in South Moravia. The Dukovany site was chosen because of the nearby pumping hydro power plant in Dalesice with the balancing reservoir Mohelno, both located on the Jihlava River. The hydro system serves as a reservoir of cooling water for the nuclear power plant.

Construction started in spring 1974
The construction of the NPP started in April 1974 but works were suspended between 1976 and 1978. During this period, the design was modified to fit the updated model of the VVER 440 –V213. It was a very successful model of PWR reactors based on previous Russian operating experience. The construction resumed in late July 1978. The Czech national companies played a dominant role in the construction of the NPP, and the manufacture and montage of the equipment. 85% of all equipment was made in the Czechoslovakia incl. reactors, steam-generators, turbines, etc. Companies such as Skoda, Vitkovice and Kralovopolska were the main suppliers.

In full capacity in 1997
The pressure vessel was fitted in the structure of Unit 1 in November 1982 and the first criticality was achieved in February 1985. Full power was achieved one month later. Next three Units were subsequently commissioned in 1986 and 1987. Dukovany NPP reached its full power of 1760 MW in July 1987. From the beginning of its operation in 1985 to the end of 2004 the nuclear power plant produced more than 238 billion KWh of electricity.

Nowadays
Over the whole period of its existence the Dukovany nuclear power plant has featured high reliability, low rate of failures and high safety. The major asset of the NPP is its contribution to fighting climate change. It saves 17 million tons of CO2 a year that would be otherwise released into the atmosphere by burning 11 million tons of coal in thermal power plants.

Nuclear is the cheapest power source
Nuclear reactors are operated at full power in the long term for technical and economic reasons. Refuelling is performed once a year and during this process approximately one fifth of the fuel in the reactor is replaced. Since 1985 Dukovany NPP has changed its fuel cycle from a 3-year cycle to a 5-year cycle and such a change has reduced the volume of spent nuclear fuel by 5.3 tons per Unit and per year. Such a modification has a significant economic impact, resulting in cutting

down fuel and storage costs. By the end of 2004, Dukovany NPP had already saved more than 6 billion CZK.

The advanced nuclear fuel with a 5-year cycle was used at Dukovany NPP for the first time in 2003 in Unit 2 and later on in Units 1 and 4. This year, during the refuelling of Unit 3, a completely new type of fuel is used for the first time. This new fuel is characterised by reduction of Uranium 235 enrichment from 4.38% to 4.25% while maintaining the same fuel assembly performance. Full transition of all four Dukovany Units to the 5-year cycle will be accomplished by 2008. The Russian company TVEL from Elektrostal factory (near Moscow) is a fuel supplier for Dukovany NPP and the contract for the advanced fuel is valid until 2011.

Nuclear Safety
Nuclear safety is a basic requirement of the Dukovany NPP operation. It consists of a set of technical and organisational requirements, aiming to ensure that the nuclear fission process and corresponding release of radioactivity remain under control whatever the conditions. Apart from nuclear safety, the power plant staff closely supervises radiation safety. Radiation protection of human beings and of the environment is ensured by protecting them against consequences of ionising radiation and contact with radioactive substances.

Trained and highly qualified personnel
The outstanding operation of Dukovany NPP is not only a result of designers, builders and manufacturers' efforts. A highly trained and qualified operation personnel is working at Dukovany NPP. Every employee has to successfully go through health examinations and regularly repeated psychological tests. Provided that he/she fulfils all general qualification requirements, he/she is trained in the Training Centre for the job. The most specific training is provided for the licensed operators in main control rooms whose expertise is examined every two years by a state examination committee of top experts in the nuclear sphere. All in all 17% of workers have trade and craft qualification, 49% high school qualification and 33% university education.

Among the best performers
According to expert assessments, Dukovany NPP belongs to the best performers among nuclear power plants worldwide. With regard to a number of parameters and indicators, Dukovany NPP is above the European average. Nuclear operators worldwide use performance indicators of WANO (World Association of Nuclear Operators), based on which Dukovany Units are in the first 20% of all reactors.

Public acceptance
The population living near the nuclear power plant is in favour of nuclear power. According to an opinion poll, about 90 % of the inhabitants living in a zone of 20 kilometres around the plant back the operation of the nuclear power plant.

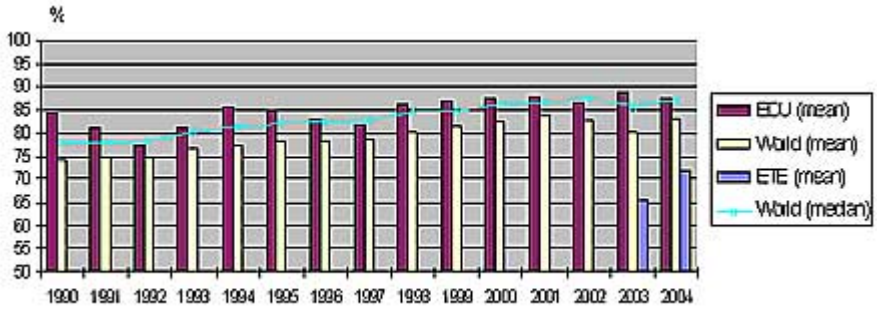
Future
As it was proved, the equipment of Dukovany NPP is capable of being operated much longer than 30 years than initially designed. Lifetime analysis and the aging of equipment showed that the lifetime of the vital parts, particularly reactor vessels are from 70 to 140 years (on different Units). Other equipment is in a similar shape. That is why the CEZ management decided to extend the lifetime of Dukovany NPP to forty years, i.e. to 2025, at least. Based on this decision a Harmonisation Programme has been developed which sets up a number of particular projects (80) incl. equipment, licensing, documentation, PR, personnel, competitiveness and

management.

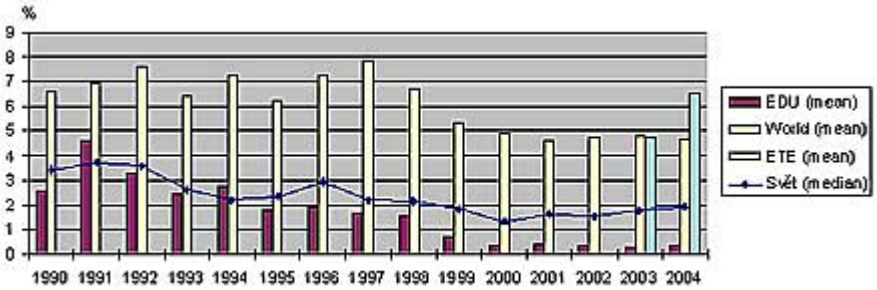
Performance Indicators (source WANO)

EDU = Dukovany NPP, ETE = Temelín NPP

Capacity Factor

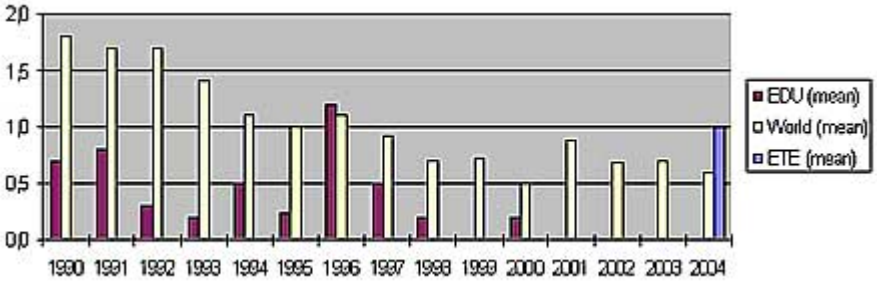


Unplanned Capacity Loss Factor



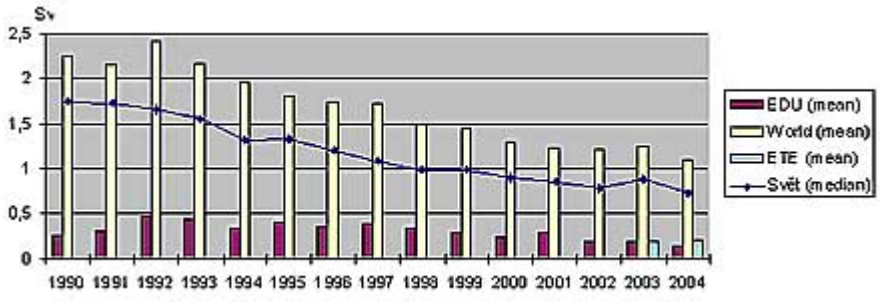
Unplanned Automatic Scrams per 7,000 Hours Critical

Dukovany NPP has had no scrams for more than four years at any of the four Units



**Collective Radiation Exposure,
Man-Sieverts per unit**

Dukovany NPP is Among Absolute Best NPPs Worlwide



Dukovany NPP - Basic Data

Significant Dates of Dukovany NPP Units

Stage / Unit	1.	2.	3.	4.
Positioning of RPV	26.12.1982	22.4.1983	27.2.1985	20.12.1985
First hydro-testing	25.11.1983	6.4.1984	12.3.1986	2.9.1986
Minimum controllable power	12.2.1985	23.1.1986	28.10.1986	1.6.1987
First connection to the grid	24.2.1985	30.1.1986	14.11.1986	11.6.1987
100% Power	26.3.1985	21.2.1986	7.12.1986	3.7.1987
Test operation	3.5.1985	20.3.1986	20.12.1986	19.7.1987
Commercial operation	3.11.1985	21.9.1986	20.6.1987	19.1.1988

Dukovany NPP - Technical Parameters of Units

Total installed capacity	**1760 MWe**
Thermal efficiency	**32 %**
Total efficiency	**29,2 %**
PRIMARY CIRCUIT	
Type of reactor	PWR
Number of reactors	4
Fuel	Slightly enriched Uranium U 235
Mass of fuel	42 000 kg
moderator	Water with boric acid
Number of controlled rods	37
Number of fuel assemblies	312
Steamgenerator type	Horizontal, cylindrical
Number of SG per Unit	6
Pressuriser type	cylindrical, vertical
Number of pressurisers per Unit	1
SECONDARY CIRCUIT	
Turbine type	3 parts, impulse, condensing turbine
Turbine power	220 MWe
Rotation speed	3000 rpm

Number of TGs per Unit	2
Generator	Double-current g., synchronous atlernator
Number of Generators per Unit	2

Production History of Dukovany Units (GWh) 1985 - 2004

	1985	1986	1987	1988	1989
Unit 1	2397	2853	2768	2715	3156
Unit 2		2988	2855	2956	3216
Unit 3		308	3325	3193	2864
Unit 4			1753	2952	3182
Total in year	2397	6149	10701	11816	12418
Total (GWh)	2397	8546	19247	31063	43481

	1990	1991	1992	1993	1994
Unit 1	3180	2742	3173	3240	3279
Unit 2	3021	3098	2831	3257	3094
Unit 3	3187	3196	2918	3190	3344
Unit 4	3197	3096	3328	2940	3260
Total in year	12585	12132	12250	12627	12977
Total (GWh)	56066	68198	80448	93075	106052

	1995	1996	1997	1998	1999
Unit 1	2966	3353	3296	3176	3092
Unit 2	3263	3019	3145	3423	3411
Unit 3	2690	3066	2905	3298	3464
Unit 4	3311	3412	3149	3281	3390
Total in year	12230	12850	12494	13178	13357
Total(GWh)	118282	131132	143626	156804	170161

	2000	2001	2002	2003	2004
Unit 1	3553	3557	3492	3240	3241
Unit 2	3161	3341	3378	3474	3297
Unit 3	3413	3214	3487	3506	3530
Unit 4	3461	3482	2941	3535	3565
Total in year	13588	13593	13299	13755	13632
Total(GWh)	183748	197324	210623	224396	238028

http://www.euronuclear.org/e-news/e-news-9/yg-forum2005.htm

MEMBER SOCIETIES

The First European Nuclear Young Generation Forum 2005 launched in Zagreb

Zagreb, capital of small Central European and Mediterranean country, has a privilege to host the first European Nuclear Young Generation Forum 2005, shortly Forum, within 7-12 June 2005. The Forum was organised on the initiative of YGN of the Croatian Nuclear Society as an event jointly co-organised with the European Nuclear Society (ENS) and the International Youth Nuclear Congress (IYNC). The idea to organise such an event appeared during the ENS YGN Core Meeting in September 2004. Nevertheless, a short period of preparations did not reflect to quality of the Forum itself and variety of activities it consisted of.

A crew of around 80 young professionals, researchers and postgraduate students, with background in nuclear science / engineering, from 19 countries (of which 18 are ENS member countries) came to the Faculty of Electrical Engineering and Computing (FER) at the University of Zagreb to take part in this multi scope event.

The Forum started with a gala welcome buffet and continued next morning with the opening plenary session. Representatives from Croatian Nuclear Society, University of Zagreb, NPP Krško and State Office for Nuclear Safety has welcomed all participants to Zagreb. The ENS representative at Forum, Gaston Meskens, Chairman of the ENS Program Committee & ENS Representative to the United Nations FCCC and CSD, has given a strong support and encouraged participants to contribute and benefit from this Forum.

Opening Plenary Session at the University of Zagreb

The organisers has put some initial standards what Forum as YG event should include. First of all, the Forum was a technical event since the whole first day was reserved for the workshop on various concepts for radioactive waste management. The invited speakers were well prepared and motivated young professional coming from companies dealing with radioactive waste. The workshop has covered topics such as Scandinavian, French, Belgian, Accelerator Driven System (ADS) concepts for waste management and innovative concepts in USA too. The workshops were really interactive between presenters and the audience followed with comments and constructive roundtable discussion.

Waste Management Workshop organised by YGN

The second significant constituting components were two guided technical tours. The first one led to the Westinghouse type Nuclear power plant Krško in Slovenia. The participants were welcomed by NPP's Director of Production in the NPP's information centre in the city of Krško and had opportunity to hear most important facts on operational and safety status of NPP Krško. Later on the professionally guided visit in NPP Krško was set to see turbine building and main control room, cooling towers, essential service water system, dam and intake part from river Sava.

Technical Tour in NPP Krsko

The second technical tour was hosted in the laboratory for in-service inspection of the Institute for Nuclear Technology – INETEC Ltd in Zagreb. The Institute's personnel presented their mainstream business which covers the in-service inspection of the reactor pressure vessel and reactor pressure vessel head, both for PWR and VVER reactors, and additionally steam generator U-tubes inspection, plugging and unplugging process for PWR and VVER reactors. The technical tours ended with barbecue at a great Jarun like in Zagreb with a spirit of domestic live band.

One day was completely programmed to enforce international networking among young nuclear professionals. The whole Friday was dedicated to presentations from various ENS YGN countries (and USA) on their members' activities within the last decade. Additionally to oral presentations there was a poster session specially focused on the YGN activities.

International networking among young nuclear professionals

The acknowledgment goes to the IAEA representative, Geetha Sadagopan, for presentation on Education and training in radiation protection and waste safety. The ENS representative, Gaston Meskens, continued with a lecture on Complex Problem Solving. The representative of World Nuclear Association, Irina Borysova, had a presentation entitled as "Nuclear Renaissance: A Global Reality". For the majority this was also an opportunity to become acquainted with the operation of World Nuclear University, and its first Summer Institute to be held in Idaho Falls this year. Kim Dahlbacka, ENS YGN Chairperson, came with a presentation of results of interesting survey he conducted in co-operation with YGN colleagues in ENS member countries on the future of nuclear energy foreseen by young generation.

In the UN's World Year of Physics 2005 ENS YGN is celebrating 10th anniversary of its existence and work. This was a great opportunity to celebrate this anniversary in Croatia in presence of so many participants. The Forum culminated in official celebration of 10th Anniversary of ENS YGN in splendid evening and dinner at Croatian Journalists' Society covered with a performance of live rock band.

10th Anniversary of ENS YGN at Croatian Journalists' Society in Zagreb

The Forum was also a place for youngsters to plan and organise some future events – International Youth Nuclear Congress 2006 to be held in Sweden with a technical tour in Finland. At the same time a regular ENS YGN Core Meeting with Board elections took place at this Forum.

IYNC 2006 Executive Committee Meeting and ENS YGN Core Meeting with new Co-Chairperson Igor Vukovic, outgoing Chairperson Alexandre Tsibulya and new Chairperson Kim Dahlbacka.

The last day was prearranged for a visit to the National park "Plitvice Lakes", a part of UNESCO world natural heritage. Events attended by young people are always followed with a numerous social events. With so many present countries and great contribution this was simply the best way to improve networking and exchange experience on one place. Those with surplus of energy and spare time joined to the six-day long Post-Forum Sailing Tour at the Dalmatian coast and islands.

The Forum has finished with a trip to the National park "Plitvice Lakes"

We are very happy about the fact that YG contributed in starting of new ENS co-organised event and moreover that YG within the Europe is becoming more successful and efficient with concrete results on the benefit of the whole European nuclear community.

The organisers are thankful to the sponsors (ENS, IYNC, Westinghouse Electric Sweden, NPP Krško, Croatian Electrical Utility - HEP, Faculty of Electrical Engineering and Computing - FER, Ministry of Science, Education and Sports, Enconet International, Enteko, National and Zagreb Tourist Board) who supported organisation of the first Forum, without which support this event would not be an event such it was.

At the very end the youngsters have spontaneously agreed this experience was fruitful, educational and at last experience far beyond the technical!

YGN will do an additional effort for the Forum to become a traditional biannual event, in between IYNC and vice versa. Next Forum is expected to be in June 2007. The YGN member countries are encouraged to take into consideration their nomination and give a proposal for hosting the next Forum.

Prepared by: Igor Vukovic, Croatia, ENS YGN Co-Chairperson 2005-2007

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http://www.euronuclear.org/e-news/e-news-9/jan-runermark-award.htm

MEMBER SOCIETIES

Per Brunzell (Sweden) wins the ENS Young Generation Jan Runermark Award 2005

Per Brunzell

The first Young Generation initiative worldwide was initiated in Sweden in 1994 and this year, ENS celebrating the 10th aniversary of ENS YGN, a celebration that would not have been true without the Swedish initiative. The ENS YGN Jan Runermark award 2005 goes to Mr Per Brunzell.

Per has been working in the Nuclear Power Industry for some 25 years. He started as a core designer at ASEA Atom as a young engineer and just ended his assignment as

VP Customer Relations and Sales/Europe of Westinghouse Electric Sweden. Back in time, Per was also a close friend to Mr Jan Runermark himself, and he was deeply involved in the discussions leading to the startup of Young Generation in the early 90:ies.

Per´s own experiense of the development of the nuclear industry in Sweden and the rest of Europe together with his early discussions with Mr Runermark regarding young genaration has given him a very supportive attitude towards young generation. During his years with Westinghouse, Per has always supported the local activities of Young Generation Sweden and of course also our international activities. Per is always present at seminars arranged by the YG Sweden. Per has, throughout the years, been a key-person to motivate the CEO´s of companies within the industry to keep the support for YG-activities in Sweden and our activities in Europe and the rest of the world, by his active and strong support for Young Generation.

Per Brunzell and Igor Vukovic, ENS YGN Co-Chairperson 2005-2007

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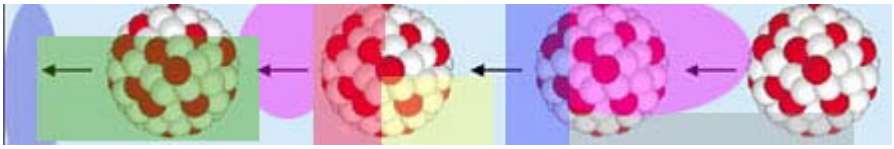
http://www.euronuclear.org/e-news/e-news-9/cowam2.htm

EUROPEAN INSTITUTIONS

Community waste management: an EC-funded initiative



What is COWAM 2?

The COWAM (Community Waste Management) project is a European-Commission funded initiative that began back in 2000 with EU money from the EU's Fifth Framework Programme for research (FP5). The initial COWAM project covered the period 2000-2003. COWAM 2 took over the baton in 2003 and will continue until 2006. The work of COWAM 2 centres on input from the 5 Work Packages (WPs).

Each WP covers a different specialized area of research. These areas are as follows:

- Implementing local democracy and participatory methods
- Influencing local actors involved in the national decision-making process
- The Quality of decision-making processes
- Long term governance
- Integration and knowledge management

The main objective of COWAM 2 is to find mechanisms for involving local communities more in the decision-making process that determines where waste management plants should be sited. The COWAM 2 team's work has been carried out into a number of diverse fields of research that look at both technical and societal issues. Among the many areas of research currently under the microscope are information and communication campaigns, stakeholder dialogue, local governance, financing and compensation and ethical guidelines for governing the decision-making process.

Report on the July seminar

The Annual Seminar of COWAM 2 took place in Ljubljana, on 6+7 July 2005. 140 delegates from 10 countries congregated in the pretty Slovenian capital to discuss a range of important topics related to increasing public involvement in the selection process for locating future waste management sites.

The first Plenary Session on Day 1 of the Annual Seminar was devoted to an analysis of the situation in the host country. Slovenia has one NPP, at Krsko, one research reactor and one uranium mine that is soon to be closed. The NPP is a joint venture run with neighbouring Croatia. The session kicked off with an opening address from Slovenia's Economy Minister, Andrej Vizjak.
He stressed the importance of gaining public confidence and consent for local waste management projects and of adopting a clear methodological approach to site location as a means of achieving public acceptance.

The highlight of Day 2 was the presentation to conference of the WPs' status reports. Each WP presented the latest state of play with its work, delivered fresh data and fielded questions from the conference floor. The current situation can be summarized as follows:

WP1 is focusing on maximizing the effectiveness of local stakeholder committees, assessing tools for informing and educating citizens more effectively and measuring levels of local support.

WP2 is studying ways of establishing best practices for local actors to play a full role in the decision-making process, more specifically by setting up stakeholder reference groups (SRGs) that meet and dialogue regularly with local and national authorities. These SRGs involve stakeholders at every stage of the process.

WP3 is concentrating on analyzng how to promote improvements in the quality of the decision-making process. It gives practical recommendations on how to design and implement a "robust" decision-making process and on how to involve

stakeholders better at every stage of that process.

WP4 has developed, as part of its analysis of long term governance issues, a set of ethical guidelines that should underpin how everyone involved contributes to the process. The guidelines that it has identified are responsibility, justice and democracy. It also reported on its research into financing systems, which takes account of socio-economic factors and analyzes related issues like benefit sharing and compensation.

Finally, WP5 is concentrating on integrating the work of all the WPs so that the COWAM 2 end product – primarily the Final Report and Recommendations that it will deliver in July 2006 - accurately reflects the work done by the WP teams and the synergies that exist between the various study fields.

The presentation of WP5 served as a prelude to the last Plenary Session, which was devoted to analysis of the national delegations' status reports ("National Insights").

Conclusions

The COWAM 2 Annual Seminar highlighted the problems and successes that the project has encountered so far. The results vary greatly from country to country because each one has a different stakeholder culture and tradition for local participation in decision-making. Predicting how much improved governance will help more waste management sites to be built is difficult to do. Across Europe, the COWAM picture is mixed one, with both positive and negative. However in spite of these problems, the COWAM 2 project has been a very useful exercise. It has helped focus the mind of all parties involved on the importance of gaining the acceptance and support of local populations before building a new waste management site. It has helped all parties to acquire the necessary governance skills and should, hopefully, deliver a positive end result. The Final Report will tell us more about how exactly successful it has been. For more details on the work of the COWAM 2 group, consult the dedicated website at: www.cowam.org

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http://www.euronuclear.org/e-news/e-news-9/foratom.htm

EUROPEAN INSTITUTIONS

FORATOM Task Force focuses on Baltic Sea Region

On 22 June 2005, the FORATOM Task Force on New Member States met in Brussels. MEPs, ministry officials from the New Member States and representatives

of the European nuclear industry discussed the energy situation in the Baltic Sea Region. Here is a FLASH report on the meeting:

AlejoVidal-Quadras, Vice-President of the European Parliament, began by giving an overview of the situation in the new Member States, highlighting the decommissioning of the Ignalina nuclear power plant (NPP) in Lithuania and contrasting it with the new-build project in Finland. Vidal-Quadras emphasised that nuclear energy's greatest assets are that it does not emit CO2 and that it supports sustainable development.

The first session focused on security of supply in the region. Finnish MEP Eija Riitta Korhola, a member of the Parliament's Environment and Human Rights committees, talked about co-operation in the field of energy in the Baltic Sea Region. She stressed the importance of connecting electricity grids between the Baltic Sea states, illustrating the Baltic Ring project that will link Finland and Poland with the Baltic States. On the question of new-builds in the region, she advocated an interdisciplinary approach that embraces environmental, human rights and energy issues is essential. The Emission Trading Scheme has not helped reduce greenhouse gas emissions. According to the European Environment Agency, 9 out of 15 Member States failed to meet their emission targets up to 2003. Meanwhile, the whole of Europe is becoming increasingly dependent upon energy imports, especially gas from Russia. In Korhola's view, the solution for countries in the region that are keen to fight climate change and encourage energy independence is to invest more in nuclear energy. However, the decision to build a NPP should be taken only if there is a real commitment to reduce greenhouse gas emissions and improve energy efficiency. Against this background, Sweden's decision to phase-out nuclear energy in favour of more renewables is unrealistic, as renewables will never produce enough electricity to replace nuclear power.

Dr Haug, FORATOM's Director General, highlighted the link between energy and human rights, stressing how not having access to sufficient energy is an infringement of citizen's human and democratic rights.

Prof. Jurgis Vilemas of the Lithuanian Energy Institute then spoke about the situation in Lithuania. He began by making the point that the closure of the Ignalina plant will not have a great impact on his country because Lithuania, like Estonia, currently enjoys an energy surplus. Lithuania produces three times more electricity than it consumes (Estonia twice as much). It has a developed its own district heating system and although it is not linked to the Western power grid, it is connected with the other Baltic States. Further connections are planned with Finland, Poland and Sweden. Lithuania also has an efficient natural gas supply system with underground storage. It also imports oil. However, Russia is its sole supplier of oil and gas. Greenhouse gas emissions in the Baltic region are well below the limits set by the Kyoto protocol. The way forward for Lithuania, according to Vilemas, is to maximise current combined heat and power capacity, modernize the thermal power plants and build new combined heat and power facilities. Vilemas concluded by recommending that the lifetime of Ignalina II should be extended until 2017 and that a new NPP should only be considered if fuel prices remain very high and are not built before 2025.

Latvian MEP Valdis Dombrovskis then presented the situation in his country. Latvia imports 40% of its energy and the rest is produced domestically at small power stations. While electricity production in the Baltic States is bound to fall because of the shutdown of Ignalina and of oil shale plants in Estonia, energy demand in Latvia is growing by 3-4% a year. As Latvia is not connected to the Western power grid,

security of supply is a problem. The Latvian Energy Ministry has proposed three solutions to the problem of security of supply: the building of an NPP in Ignalina, connecting Baltic States' grid to those in Finland and Poland, and the completion of a common energy market in the Baltic States. Dombrovskis insisted that the Baltic States must co-operate closely on future energy policy.

Andres Tarand, an Estonian MEP, then gave a broad brushstroke of the situation in Estonia. In the 1990s, Estonian scientists claimed there was no alternative to oil shale, but now they think otherwise. Oil shale power stations are very polluting and EU environmental law requires them to be shut down. Estonia should continue to exploit its small combined heat and power stations, reduce its natural gas consumption in order to become independent from Russian imports and use biomass and wind power more. Nuclear energy is not yet on the Estonian political agenda and a national debate would have to take place first. A recent opinion poll conducted by the Faktum research center shows that 60% of the Estonians are against nuclear power, but the figure was 80% twenty years ago. So, things are changing - gradually.

The second session was a lunch debate on the prospects for nuclear power in Poland. Elzbieta Wroblewska, Deputy Director of Poland's Ministry of Economy and Labour (Energy Department), spotlighted Polish energy policy up to 2025. Although coal is the main energy source in Poland and will remain so, nuclear power is now firmly on the political agenda. Poland plans to diversify its energy mix by building its first two-unit NPP by 2021. Hanna Trojanowska, Director of International Affairs at the Polish Power Grid Company emphasised that decision to build NPPs was made to meet increasing demand, reduce CO2 emissions and lower the price of electricity. However, some preconditions must be met. Firstly, the Polish public must approve the nuclear programme. Secondly, expertise and know-how must be increased. Finally, a workable legal and financial framework must be set up. Prof. Stefan Chwaszczewski, Deputy Director of Poland's Institute of Atomic Energy, highlighted Poland's current research into nuclear reactors.

Finally, Polish MEP Jerzy Buzek asserted that the rise of oil and gas prices and the climate change crisis have forced European countries to opt for or reconsider nuclear power. "Renewables are an excellent idea, but too costly. Nuclear power is the best solution in Poland, and elsewhere, but a public debate is needed. Polish nuclear projects were stopped twice before, once in the 1950s and then following the Chernobyl accident." Buzek remains unconvinced that nuclear is the cheapest option. FORATOM President, Eduardo Gonzalez Gomez referred to a recent NEA study into the cost of generating electricity that favourably compares the costs of nuclear energy with other energy sources. For Buzek, coal power stations cannot be replaced by NPPs in Poland - both options must be considered. Consequently, the nuclear and coal industries must co-operate to help combat climate change and meet Poland's energy needs. NPPs must be built and joint research on carbon capture carried out. FLASH will continue to report on the work of FORATOM's Task Force on New Member States.

http://www.euronuclear.org/e-news/e-news-9/monju.htm

ENS WORLD NEWS

Japan: green light for Monju

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Mr. Bertrand BARRE
AREVA
President of INSC
President of ENS
27-29, rue le Peletier
75 433 Paris cedex 09, FRANCE

May 30, 2005

Dear Mr. BARRE,

I am very pleased to inform you that today's judgement of the Supreme Court confirmed the validity of the Government's licence for the establishment of Fast Breeder Reactor Monju. The Supreme Court judged to reverse the judgement of Nagaya High Court that ordered to nullify the government licensing establishment of Monju.

The legitimacy and pertinency of the licensing and the safety review for Monju were confirmed by the court. Hereafter, we steadily continue the modification work and necessary procedure towards the restart of Monju.

Thank you very much for your long-term support in the past and in future.

Sincerely yours,

Yoichiro Kishimoto
Director, Tsuruga Head Office,
and Executive Vice President, JNC

JNC Head Office: Muramatsu 4-49, Tokai-mura, Ibaraki-ken, 319-1184 Japan Tel: +81 29 282 1122 Fax: +81 29 282 6049

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THE WORLD'S NUCLEAR NEWS AGENCY

THE NUCLEAR COMMUNICATIONS NETWORK
8 July 2005 / Feature N°10/05 / B

Opinion: No Energy Source Should Be Idealised Or Demonised

In an article for the summit of G8* leaders which ends today in Gleneagles, Scotland, the executive director of the International Energy Agency, Claude Mandil, says "no single energy source should be idealised or demonised" in tackling climate change.

Climate change has been high on the agenda of the International Energy Agency (IEA) and of its member countries for years. This is not surprising as 80% of greenhouse gases are emitted through energy production or consumption. The answers to climate change lie in both energy and environmental policies. And the response has to be on a global scale. British prime minister Tony Blair recognised this strong link when he invited the IEA to participate in discussions between the G8 and the outreach countries (Brazil, China, India, Mexico and South Africa) on climate change and other global economic issues.

The starting point for the international effort against global warming is the UN Framework Convention on Climate Change (UNFCCC) which has been signed by almost all countries and which came into effect in 1994. Its ultimate goal is to stabilise the CO_2 content of the atmosphere by sharply reducing CO_2 emissions worldwide.

Are we on track? Unfortunately not, far from it. According to recent IEA analysis in the "World Energy Outlook 2004" [see also News in Brief No. 47, 2nd November 2004], continuing to do business as usual leads to a 60% increase of CO_2 emissions by 2030. It is the result of more world inhabitants, more energy consumption per capita and more fossil fuels in the energy mix. Most of the growth in emissions over

the next 25 years will occur in developing countries, yet 1.4 billion people will still not have access to electricity in 2030. Can we curb such disastrous trends in a way consistent with the need for economic growth and poverty alleviation?

The need for action is urgent. Any tonne of carbon dioxide we do not emit today is a tonne our grandchildren will not have to deal with in the future, probably at much higher costs. In the meantime countries will need to deal with the effects of climate change which will also pose a burden on their economies. We need to start today. But how?

In the long term, there is general agreement that significant technology breakthroughs will be needed to solve the problem. Breakthroughs are needed in a number of domains: cost-effective renewables, particularly cheap photovoltaics and advanced biofuels; nuclear, with an acceptable solution for nuclear waste management; energy transportation and use, especially in cars and buildings; and last but not least carbon capture and sequestration, as there is no foreseeable replacement for fossil fuels for quite some time. Hydrogen used in fuel cells is another promising technology.

Governments must actively promote and support energy research and development budgets, and increase cooperative work, both among countries and with the industry. That means not only reversing present trends of shrinking public R&D budgets, but committing more funding and increasing the budgets.

Governments should avoid prematurely picking “winning” technologies. For the time being all avenues will need to be explored and there is no silver bullet. No single energy source should be idealised or demonised. Obviously some technologies seem more promising than others. They should be identified and more efforts should be targeted in these areas, but eventually the winners will be selected by the market.

But in the shorter term, there are steps we can take today. In its “World Energy Outlook 2004”, the IEA produced a so-called “Alternative Scenario” based on more aggressive policies and technology uptake. This scenario merely supposes that the energy mix worldwide includes a little more renewables, a little more nuclear and, most important, that energy efficiency improvements reach again the pace they achieved in the 1970s and 1980s.

These measures would still not stabilise global emissions, and more would need to be done. Nevertheless, the result is impressive: CO_2 emissions in the OECD begin to decline in 2020 and by 2030 are 16% lower than the business as usual scenario – some 50 billion tonnes of CO_2 could be avoided by 2030.

Much of this is achieved through greater energy efficiency. For example, if OECD households chose more efficient appliances, they could save 30% of the power consumed by OECD appliances. There is also significant potential for energy savings in transport, buildings and industry (including coal-fired power plants), especially in developing economies.

That is not all. Energy efficiency is a policy with double or even triple dividends. While reducing CO_2 emissions, it improves energy security of supply as well and, when available at zero or negative costs, it contributes to economic growth. For example, oil saving can help ease the pressures in the oil market by slowing demand and, according to our analysis, help to dampen oil prices by up to 15%.

That is certainly the reason why the governments in most consuming countries have now put energy efficiency among their top priorities. Speaking at the US Energy Efficiency Forum on 15th June 2005, President George Bush stated: "The first step is… to improve conservation and efficiency."

Gathering for their biennial meeting on 3rd May 2005, energy ministers from the IEA member countries committed to reinforcing their efficiency efforts. The G8 summit agenda is a very timely opportunity to emphasise these commitments and to explore ways of implementing them. But nothing can be achieved within G8 or OECD countries alone. The challenge of climate change needs to be addressed worldwide, taking into account the concerns of developing countries. We mustn't miss this opportunity!

**The G8 stands for the 'Group of Eight' nations. It began in 1975 when then French president Giscard d'Estaing invited the leaders of Japan, the US, Germany, the UK and Italy to Rambouillet, near Paris, to discuss the economic problems of the day. The group expanded to include Canada in 1976 and Russia in 1998. Unlike many other international bodies, the G8 does not have a fixed structure or a permanent administration. It is up to the country that has the presidency (currently the UK) to set the agenda and organise the annual G8 Summit.*

Source: Claude Mandil
Editor: John Shepherd

THE NUCLEAR COMMUNICATIONS NETWORK
28 June 2005 / News N°107 /05 / A

EU And Japan's 'Privileged Partnership' Outlined In ITER Accord

The European Commission (EC) has announced details of the agreement reached earlier today that will see the International Thermonuclear Experimental Reactor (ITER) project based at the EU candidate site of Cadarache, France [see also News Alert No. 2, 28th June 2005].

Although Japan lost its bid to site ITER at its candidate site, in Rokkasho, the EU and Japan will cooperate in what the EU said will be a "privileged partnership". Highlights of the agreement* are:

- Japan will provide high-tech components corresponding to 20% of the total procurements for ITER construction;
- The EU will also make contributions to other (so-called Broader Approach) projects in cash and in kind;

- The EU will support a "suitable Japanese candidate" as director-general of the planned ITER organisation and Japan will have the right to supply "more than a proportional share" of the organisation's staff;

- Some ITER headquarters functions, including meetings of the ITER council, could be based in Japan;

- If, at a later phase of the project, there is an international agreement to build a demonstration reactor, the EU would support Japan's candidacy to host it;

- For the EU, a new organisation will be established in Spain through which contributions (in cash and in kind) will be provided to the ITER organisation.

The ITER project involves the construction of an experimental fusion reactor to assess the feasibility of fusion energy as an energy source and, consequently, the feasibility of constructing a subsequent demonstration reactor – possibly with commercial fusion reactors to follow.

ITER spokesman Bill Spears described the project as "a key step between physics and implementation". He told NucNet that if ITER proves viable, many countries may want to build their own demonstration reactor. Mr Spears said that if, as the EU indicated, there is an international agreement to build such a unit, Japan would likely host it.

Meanwhile, the six ITER parties will also share the estimated 4.57 billion euro (EUR) construction cost at Cadarache, with the EU and France contributing 50% and the other parties 10% each. Operation costs are expected to total about another EUR 5 billion. The total cost will be spread over 30 years – 10 years for construction and 20 years of operation.

The director-general of Foratom, the trade association of the European nuclear industry, Dr Peter Haug, said: "This will provide a major boost for the European nuclear energy industry and is well-earned recognition of its excellent research credentials."

Dr Haug, who is also secretary-general of the European Nuclear Society, added that the decision "shows that nuclear energy remains an important energy option and sends out a positive signal that the nuclear industry offers talented young people the opportunity to pursue a challenging and worthwhile career in a sector that is at the cutting edge of modern technology".

Of the six ITER parties, the EU, Russia and China had favoured basing the project at Cadarache while Japan, the US and South Korea had favoured Rokkasho [see News in Brief No. 46, 21st April 2005].

Negotiations had been deadlocked over the siting since December 2003, preventing progress on technical aspects of the project. But in early 2005 the EU insisted that, if necessary, it could build the ITER reactor in France even without the support of the other parties. In April 2005 the EU and Japan agreed to accelerate talks to reach an agreement [see News in Brief No. 46, 21st April 2005].

In announcing today's decision at a meeting of the six parties in Moscow, the EC said: "This agreement heralds the end of a deadlock between two alternative sites for the reactor and is an important milestone in the move towards establishing fusion as a

sustainable source of energy production.

"Now that this issue has been resolved, the technical work can be carried out to finalise the agreement. It is hoped that it will be possible for all parties to initial the text of the agreement by the end of this year, thereby allowing for the start of construction by the end of 2005."

*'*ITER and fusion energy research – your questions answered', is available on the EC's website (link) together with links to other information about the project.*

Source: NucNet /EC
Editor: Daniel MacIsaac

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http://www.euronuclear.org/e-news/e-news-9/greenpeace.htm

ENS WORLD NEWS

Greenpeace co-founder says nuclear energy is "only option"

Patrick Moore PhD, the American co-founder of Greenpeace and former self-confessed "born-again ecologist and environmental activist" recently gave a speech to the US government's Congressional Subcommittee on Energy and Resources in which he stated that "nuclear energy is the only non-greenhouse gas emitting energy source that can effectively replace fossil fuels and satisfy global demand." In his speech he covered a range of issues, including environmental extremism, sustainable development, radioactive waste and the growing trend among prominent environmentalists to see nuclear energy as the only solution to meeting the planet's energy needs.

It's not every day that a co-founder of Greenpeace becomes a convert to the cause of nuclear energy. With President George W. Bush currently advocating a return to nuclear energy as a means of reducing CO2 emissions, the timing of Moore's speech is all the more appropriate. Judge for yourself what he has to say by reading the whole speech on: www.greenspiritstrategies.com/D127.cfm

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http://www.euronuclear.org/e-news/e-news-9/job-vacany.htm

JOB-VACANCY

Forschungszentrum Karlsruhe
in der Helmholtz-Gemeinschaft
&
Universität Stuttgart

The Forschungszentrum Karlsruhe (Karlsruhe Research Center) invites applications for the position of

Director of the Institute for Reactor Safety (IRS).

The Mechanical Engineering Faculty of the University of Stuttgart invites applications for a

Professorship (W3, with management functions) for Nuclear Technology and Reactor Safety.

more

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http://www.euronuclear.org/e-news/e-news-9/Member-Societies.htm

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Member Societies

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