European Nuclear Society
e-news Issue 19 January 2008

ENS NEWS N° 19 – Editorial: Selling science, securing the future

Now that the traditional end-of-year festivities are over it is time to look forward - batteries recharged - to what promises to be a very important year for the nuclear community. As political events have unfolded across Europe the crucial contribution that nuclear energy makes to reducing climate change and ensuring affordable and secure energy supplies has been thrust more and more into the spotlight. Increased acceptance of the key role that nuclear energy has to play in Europe's energy mix has fuelled a sense of heightened optimism, confidence and renewed ambition in the nuclear industry. After years of stagnation the nuclear industry, buoyed by the changing political landscape, is now much more bullish. For the nuclear science community this brings with it increased responsibility to deliver the goods, a greater pressure to perform, even though it's debatable whether the resources allocated to research have mirrored the increased expectations. Nobody disputes the fact that without adequately funded state-of-the-art science and research the nuclear revival will not be sustained and rampant energy demand will not be met.

The revival has put certain problems that have long preoccupied the nuclear industry into sharper focus, making their resolution all the more urgent. One of these is the question of meeting increased demand for nuclear research with adequate supplies of young talented scientists to carry it out. It's a simple supply and demand equation. As a result of nuclear energy's years in the comparative wilderness in some countries the enduring perception among many young people today is that studying sciences or choosing a career in research do not represent a smart option. Such a perception is hard to change. Could a lack of young blood to carry things forward prove to be a serious barrier to progress at such an auspicious time for the nuclear industry? Could it even encourage the revival to stall? Interestingly, some of nuclear energy's most ardent opponents have now switched from denying vociferously that the nuclear revival actually exists to predicting that there are not enough young talented scientists to sustain it – an implicit admission that it does exist after all. On this occasion, however, the anti-nuclear brigade may not be entirely wrong. One thing is for sure, without the constant replenishment of the talent pool no industry can survive long term. But to simply let market forces satisfy the equation would be a mistake. Instead the industry must have the right framework for providing training, development and retraining for new recriuts.

But, as usual, nothing is ever quite as black and white as it seems. ***ENS NEWS*** readers certainly don't need me to tell them that there are a lot of talented researchers out there, ready to take up the baton and push back the boundaries of the possible. The whole point is that we might know it, but does the wider public? Ignorance of the facts nurtures common misconceptions about science and research. It's up to us, therefore, to communicate the facts more effectively and show how a career in nuclear

science and research can offer even the most ambitious of potential young scientists an opportunity to have a fulfilling and meaningful career.

Recent political developments at EU level have reinforced the belief that more must be done now to promote nuclear research. It is an essential ingredient in the Community meeting its future energy and environmental goals, while at the same time safeguarding its leadership in the field of science and technology. The European Commission's recently launched Sustainable Nuclear Energy Technology (SNETP), in addition to focusing on a wide range of nuclear research programmes, stresses that in order for Europe to maintain its global technological leadership "education and training in nuclear science and engineering must be strengthened."

From an industry perspective utilities have invested a lot of time and effort into identifying and attracting talented and committed young scientists to drive the nuclear revival forward. National institutes and private research centres play a vital role too, offering research opportunities for many young scientists from Europe and beyond. There are a wide range of training courses, work placements and continuous education programmes on offer for trainees and employees. In some cases professional recruitment agencies work in partnership with universities and centres of excellence to identify and recruit the best young graduates for jobs in both the public and private sectors. The Young Generation Nuclear network is also very active. It is close to the pulse of young people, contacting students, presenting opportunities, sharing its experiences and generally promoting a career in nuclear research.

Fortunately, the signs are there that the trend is slowly being reversed, as governments realise that support for studying the sciences - from primary school to university level - needs to move up a gear. In some countries, the number of students opting to study science subjects at A-level, graduate and post graduate level is slowly increasing after years of decline. Governments are now giving special support and offering incentives to those considering a career in the sciences. Better late than never, I guess. And yet, in spite of these efforts, a career in marketing, finance, communications or IT is still largely perceived by those surveying the job market as being much more "cool" and lucrative than a career in research. Of course, emerging technologies and evolving market trends have helped set the agenda and greater financial rewards have followed. So, there is a limit to what we can do in the short term to influence wider social and business trends. However, the science community must also accept its share of the blame because it has failed to communicate adequately the real value and rewards that a career in science can bring. Perhaps we have failed to explain forcefully enough to the public the connection between science and everyday life; to do our bit to counter the stereotypical view of a scientist as a bit of an anorak, living in a parallel universe far removed from the realities of life. However inaccurate and unfair some of the stereotypical views might be, we are partly to blame for encouraging their existence. Perhaps we should do more to improve our image. Good communications are vitally important.

The upcoming ENS international conference PIME 2008 (taking place in Prague, from 10-12 February) will, significantly, focus on the needs of nuclear communicators. It will feature a workshop devoted to the key subject of education and training. The emphasis will be, precisely, on communicating the benefits of a career in nuclear science and on how to better attract and retain the best young scientists through specialist education and training. It will feature a speaker from the UK's National Skills Academy for Nuclear (NSAN). At a time when the UK has just launched an ambitious new build programme, the work of organisations like NSAN is all the more significant. Of course, similar training "academies" and programmes exist in other countries too. But perhaps we ought do more to "sell" science ourselves,

rather than rely too heavily upon others. Communicating effectively is a science too – one that we should, perhaps, learn to master more. Even if you are not personally involved in the communications business you have much to gain from improved communications about what scientists really strive for, and what their achievements and aspirations are.

ENS NEWS has reported on this important issue before and will continue to do so. This time I would like to enlist your help. I invite you to share your experiences and views on the subject with ***ENS NEWS*** readers so that a real insight into what you are doing to train and retain the scientists of today and tomorrow can be shared with others. We all have a view on the subject. So, let me know what you think and illustrate what your organisation is doing. The ENS web site is also a vehicle for communicating to a wider audience our views about what the nuclear science community is doing today and planning for tomorrow. It can be a shop window for those who are considering a life dedicated to science. We owe it to those who will come after us to present the facts in a clear and persuasive way.

The first ***ENS NEWS*** of 2008 kicks off with an editorial on a subject of fundamental importance to all readers – the recruiting and training the next generation of qualified, talented and committed nuclear scientists. This is followed by a word of welcome to our recently-elected President, David Bonser. The new man at the helm of ENS, in his first ever ***Word from the President*** feature, outlines his vision of the Society's future, its priorities and the main challenges that it faces.

The events section gives important information about what is an extremely full agenda of ENS conferences. It covers PIME, RRFM, NESTet and TOPSAFE. As we "go to press" some of these conferences are getting very close (especially PIME 2008, which takes place in Prague, from 10-13 February) and those of you who intend going but haven't yet registered will need to get your skates on!

Among the subjects covered in the Member Societies and Corporate Members section are the latest experiments carried out in Sweden into the dry-out profile of BWR fuel elements, a personal appraisal of the future of nuclear energy by our Vice President, Frank Deconinck, a novel slant on the outcomes of the recent Bali COP talks and a summary of events at the Bulgarian Nuclear Society's annual conference.
The traditional Young Generation (YGN) section feature stories about how to improve nuclear's image by cross-branding with successful brands and "Bulgaria's nuclear November."

ENS NEWS N° 19 features an especially detailed review of all the significant political developments that dominated so many front pages during 2007, and which could have a profound effect upon how future research efforts are funded and focused. Without doubt one of the most significant of these developments was the much-anticipated conformation of the UK government's decision to launch a new build programme – a groundbreaking announcement that will give more impetus to the nuclear revival in Europe.

As usual, we include a number of news reports from NucNet, including one on the situation in the UK and on the World Economic Forum, in Davos.

Make sure you read all the latest news about the ENS events programme and make sure that your organisation participates in the debates.

In more ways than one, 2008 seems likely to be a momentous year. Follow the issues that will define it with ***ENS NEWS.***

Enjoy N° 19!

Mark O'Donovan
Editor-in-Chief

---

http://www.euronuclear.org/e-news/e-news-19/presidents-contribution.htm

ENS NEWS

ENS welcomes the new President

Following the recent meeting of the ENS Board and the General Assembly ENS has a new President and some new Board members. David Bonser has taken over as President from Frank Deconinck, who remains on the board as Vice President. Five new Directors were also elected to the Board. They are Martin Luthander, Bernard Jolly, Aurelio Sala, Fernando Naredo and Professor Vladimir Slugen. Before focusing on our new President ENS NEWS would first like to give a sincere vote of thanks to Frank for all the tireless work he put in on behalf of ENS NEWS while he was ENS President. It's good to know that he will continue to serve the Society and contribute to ENS NEWS in the future.

ENS Board, from left to right: Vladimir Slugen, Naredo Fernando, Dr. Joachim Knebel, David R. Bonser, Milena Cernilogar-Radež, Aurelio Sala Candela, Frank Deconinck, Dr. Krassimira Ilieva

David Bonser has long been an ENS member and a member of the ENS Board, having served as Vice President since 2006. Many of you know David well, but for those of you who perhaps don't know him quite so well here is a broad brushstroke portrait of the new man at the Society's helm.

David is British. He is a qualified engineer who graduated from Cambridge in 1971 prior to joining British Nuclear Fuels Limited (BNFL) at Risley. In a long and distinguished career he has worked as Director of the Thorp Division, at Sellafield (UK), during which time he was responsible for getting it up and running. He later became Director of Engineering, Waste Management and Decommissioning with responsibility for the Sellafield waste plants, decommissioning operations and BNFL Engineering Ltd.

Between 1997 and 2001 he was Chairman of NIREX and in 1998 was appointed a member of the UK government's advisory body on radioactive waste management, the Radioactive Waste Management Advisory Committee (RWMAC).

ENS Board Meeting at 30 November 2007, back from left to right: Igor Vukovic, Dr. Joachim Knebel, David R. Bonser, Silye Judit , Aurelio Sala Candela, Bertrand Vieillard-Baron, Prof. Philip Beeley, Miroslaw Kawalec, Bernard Bonin, Dr. Peter Leistner, front from left to right Santiago San Antonio, Prof. Frank Deconinck, Milena Cernilogar-Radež, Dr. Krassimira Ilieva

He was appointed to the Board of BNFL in 1999.

In 2001, David was put in charge of Corporate Responsibility at BNFL and in 2003 he was given executive responsibility for the company's Spent Fuel Services. Since 2004 he has been in charge of BNFL's Human Resources division.

Well, with such a long and impressive track record in the nuclear industry, we are sure you'll agree that David is – to say the least - eminently well-qualified to represent ENS and to defend its members' interests at what is a very interesting time in the history of the Society.

Once again, ENS is extremely fortunate to have such an experienced and dedicated professional as its new President. Congratulations David. Everyone at ENS NEWS wishes you the very best of luck!

Mark O'Donovan
Editor-in-Chief

---

http://www.euronuclear.org/e-news/e-news-19/word-from-the-president.htm

ENS NEWS

Word from the President

May I begin by saying how proud I am to have been elected the new President of the European Nuclear Society. It is a great honour to represent and argue for the interests of ENS and its members, many of whom are friends and colleagues I have had the pleasure of working with for many years. I pledge to do my utmost to serve the membership to the best of my ability, to promote its values and to help it achieve its goals.

In my first contribution ENS NEWS as President to I would like to share with you my vision of the Society's future and highlight some of what I see as the main priorities and challenges facing it at such a pivotal moment for the development of nuclear science.

David Bonser

At a time when there is increasing recognition around the world that nuclear power must play an important part in future energy supplies I believe that the European Nuclear Society should take a central role in being an authoritative, expert voice. With our broad membership we can draw on skills and knowledge across the board; from the science base underpinned by research reactors through fuel cycle management and the operation of many types of power reactor to the decommissioning, clean up and waste management of redundant facilities.

Society and politicians have concerns about nuclear safety, waste management and economics but they also have wider concerns about energy supply in general, security of supply and the environment. We have the opportunity to ensure that objective and consistent information about the nuclear industry is available and heard. We should continue to set up and support scientific expert groups that can produce well researched position papers and be available to participate in the debate.

ENS members have very different nuclear histories, skills and experiences. We have countries with large and small nuclear installed capacity, some with indigenous full fuel cycle capability and those who import their fuel, those who are building new capacity and those where policy is not favourable to new build, countries at the forefront of research across many aspects of the nuclear industry, those who are in the midst of decommissioning facilities whilst others have yet to face this task, we have a number of different experiences in moving towards the implementation of long term

waste management. We are, therefore, in an excellent position to share and learn profound lessons from one another. We must drive for the sharing of this experience amongst our membership so that the European nuclear industry can improve its performance. In turn, we can share best practice with our colleagues around the world by building on our links with American, Asian, Australasian and other nuclear societies.

One of my particular interests is supporting, drawing in and giving a platform to the young generation. We rely on them to provide a strong technical underpinning for our industry now and to provide the leadership for the future. We must continue to support their education and training within the industry. They are also an extremely talented, knowledgeable and committed source of imaginative communicators if we choose to use them. The young generation want to learn about the industry and to make a difference for their futures. They are very willing to energetically take on the debate and, in many circumstances, they are more credible than the 'grey suits' of the older generation. I was particularly honoured to receive the Jan Runermark Award from the ENS Young Generation Network in June 2003 for the work I had done in supporting and reinvigorating the UK's Young Generation Network.

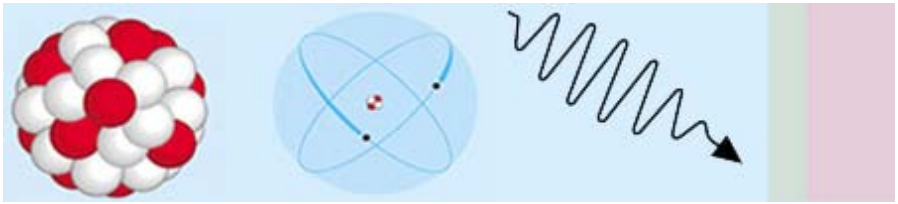
Within the ENS, I strongly support the work that has already been done to underpin sustainable funding routes. I would continue to encourage the ENS working with other societies where that makes economic and strategic sense.

---

http://www.euronuclear.org/e-news/e-news-19/listening.htm

ENS NEWS

The Devil is in the Details

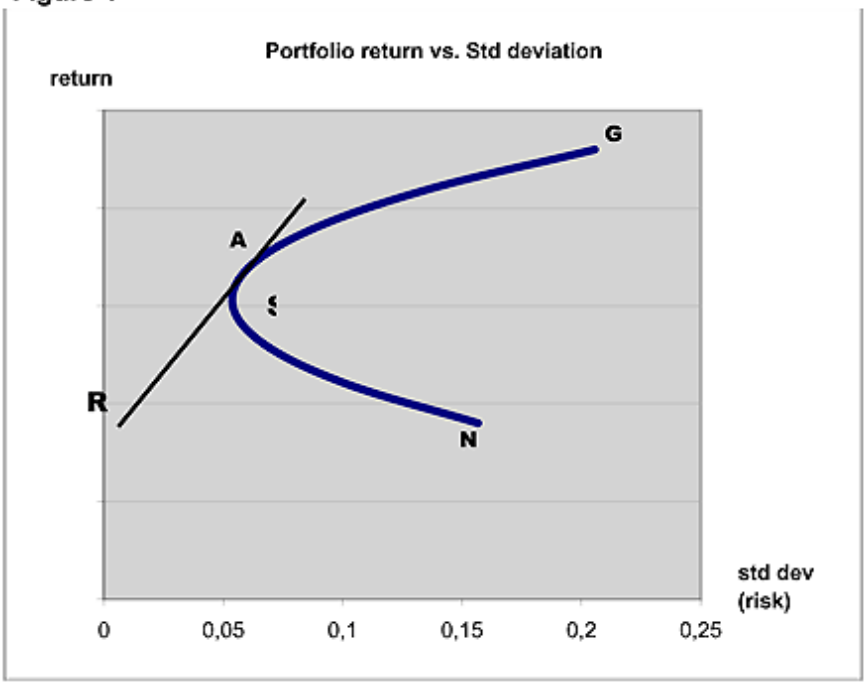


by Andrew Teller

The recent turmoil affecting the financial places around the world prompted me to open a report that had been left unattended on my desk for quite some time. Its title is "***Applying Portfolio Theory to EU Electricity Planning and Policy-Making***[I]". The term portfolio refers of course to shares and portfolio theory refers to a technique used to reduce risk when investing in shares. It is well known that the higher the expected return of a share, the riskier it will be. Portfolio theory shows how to combine shares of various risks and returns so as to achieve a better combination of risk and return that if one had invested in only one type of share. The basic idea behind this technique is that whenever different shares fluctuate differently with the stock exchange, this will reduce the overall fluctuation of the portfolio. This is illustrated by figure 1 below. Let us first concentrate on the blue curve. The end point named G is the point

where one has invested 100% in high-risk, high return shares G. The end point named N represent the situation where all the investment consists in lower-risk, lower-return shares N. As one moves on the curve from G to N, the percentage of G shares decreases gradually. The point S is the leftmost point of the curve, where overall risk is minimal. The portfolios corresponding to the portion SAG of the curve are called ***efficient*** because the points of SAG lead to higher returns than the points of SN on the same vertical, i.e. characterised by same risk. If one brings in the picture low-return, risk-free securities such as Treasury bonds (point R), further improvements can be achieved. The combinations of such securities with the portfolio characterised by point A are all on line RA. Such combinations can further reduce risk as can be seen from the chart. In particular, if one considers the intersection of the horizontal line through point S with the black line: the risk attached to it is even lower than for point S although the return achieved is the same. Further details, including the basic formula underpinning the method, can be found in the above-mentioned report.

Figure 1

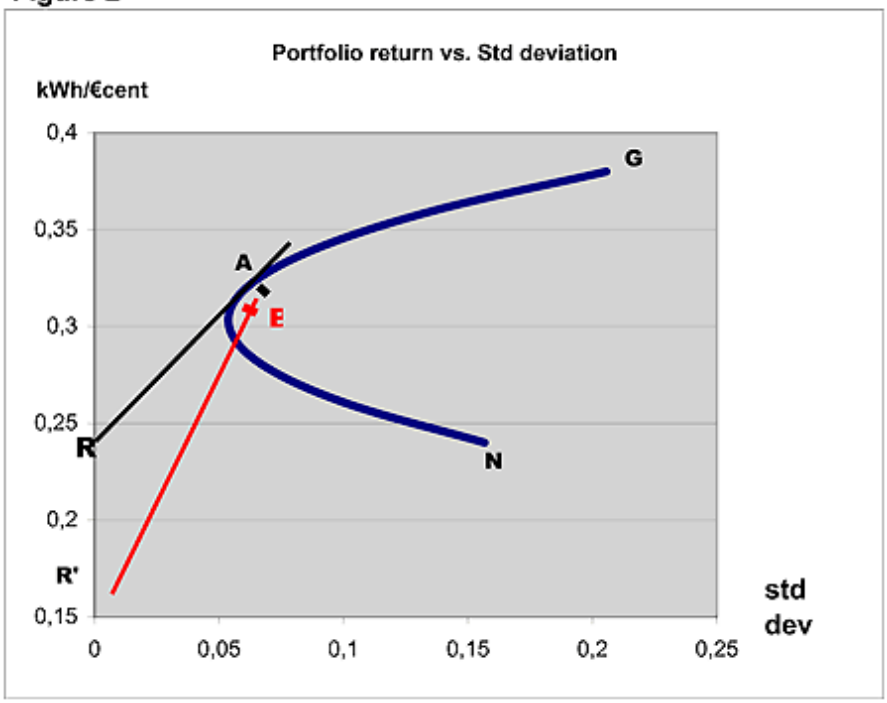


Resorting to portfolio theory when it comes to electricity planning enables one to take a broader of view of the issue. Most of the time, the various energy sources available are assessed only in terms of cost-effectiveness, i.e. in terms of the € it costs to generate one kWh. Professor Awerbuch noted that, by inverting this unit cost, one obtains kWh/€, which is akin to a return. The risk attached to such return consists of the fluctuations that can affect it and that are generated in the main by the cost of fuel. Fig 1 can now be re-interpreted in this new context and the insights of portfolio theory should be easy to apply to energy if one considers N and G as standing for nuclear and gas respectively. Can point R, which corresponds to a zero risk stand for renewables? Yes says the report, because when it comes to wind and solar energy, the fuel is free and its cost is therefore not subject to fluctuations. This is why the authors see in renewables a perfect equivalent to Treasury bonds and they proceed to draw all the lessons of portfolio theory to define an efficient energy mix for the EU. The outcome of this exercise is that one ends up with energy portfolios where nuclear energy and renewables dominate a small proportion of gas and coal. The authors repeatedly noted that high proportions of wind energy cannot be taken for granted due to its interruptible nature (notes 38, p22, 56 p28 and 76, p38) but they did not take the step of trying to assess the impact of this constraint on their conclusions. This is however a

serious departure from the financial portfolio model. After all, Treasury bonds do not provide their return part of the time only. Furthermore, energy planners differ from investors in another way: the former also set themselves the goal of being able to achieve a given peak power with a high level of confidence. To match this constraint, investors would have to be able to achieve a peak income at given times during the investment period, which is obviously not taken into account by portfolio theory.

Out of interest, I asked myself how this shortcoming could be overcome and quickly found out that it is far from being straightforward. The abovementioned constraints do not easily lend themselves to modelling: the need for continuity of supply is not easy to express in the return/standard-deviation plane; the required minimum energy return introduces an absolute value in a problem where all others are relative. One possible way consists in noting that in the future, higher proportions of renewables will require the provision of specific back-up generating capacity to make up for their low availability. This back-up would be provided by non-interruptible sources or, perhaps, by additional wind capacity spread over large areas. In either case, the expected return will be lower than the one considered in the report[II]. The consequences could be illustrated with the help of Figure 2.

Figure 2



Instead of having line RA, we would be confronted to something like line R'B. Should the orders of magnitude represented be correct, the following consequences would follow:

- The risk reduction one can expect with a return of renewables equal to R' is less than what could be obtained with R as can be easily ascertained by comparing the respective positions of the points on lines RA and R'B.

- Likewise, including a large proportion of wind in the energy mix would reduce the return of the energy mix to a noticeably larger extent than is assumed in the report on the basis of too optimistic figures for wind generation.

Alternatively, one might consider that the fuel risk borne by the back-up capacity needed by wind is to be ascribed to the latter. Point R would the leave the zero-risk vertical and move to the areas of positive standard deviation, with an effect similar to the move of R to R'.

Does all this mean that the wind option should be abandoned? Certainly not, but it does mean that overlooking one single basic fact can seriously alter the conclusions of an otherwise rigorous analysis. The devil is indeed in the details.

[I] This report, dated February 2003, was written by the late Prof. Shimon Awerbuch and co-authored by Martin Berger. It can be downloaded from www.awerbuch.com

[II] The figures used in the report date back to 2000, a time when the small proportion of wind energy in the overall mix did not imply specific back-up capacity.

---

http://www.euronuclear.org/e-news/e-news-19/pime2008.htm

ENS EVENTS

Pime 2008 - Register now!

10 - 13 February 2008, Prague, Czech Republic

PIME 2008 will offer plenary sessions and parallel workshops on a range of hot topics of concern to us all. The emphasis will be on an interactive and dynamic approach to presenting, moderating and debating the themes, as well as on providing concrete tools and practical tips which participants can actually put to good use when they get back home.

Take advantage of our **NEW online registration system** and register soon!

We highly recommend **booking your room in one of our proposed hotels very soon**. The indicated special rates are only valid until the beginning of January 2008!

Pime 2008 Conference Secretariat

www.pime2008.org

pime2008@euronuclear.org

---

http://www.euronuclear.org/e-news/e-news-19/rrfm2008.htm

ENS EVENTS

RRFM 2008

Register NOW and book your hotel room soon!

2 to 5 March 2008, Hamburg, Germany

RRFM 2008 provides an ideal opportunity for researchers, scientists and industry experts from all around the world to discuss the latest operations and projects in the research reactor field and innovative methods in the research reactor analysis! Three days of lively debates, interesting presentations and scientific as well as industrial exhibits surrounded by a high-value social programme mark this year's RRFM agenda and make it a key event to the research reactor community.

Take advantage of our **ONLINE registration system** and register NOW!

Please note that the **special rates** of the hotels that we recommend on our website will **soon expire**. Book your hotel room as soon as possible!

The RRFM2008 Conference Secretariat is looking forward to meet you soon in Hamburg and is alway at your disposal for further requests and more information.

RRFM 2008 Conference Secretariat

www.rrfm2008.org

rrfm2008@euronuclear.org

http://www.euronuclear.org/e-news/e-news-19/nestet2008.htm

ENS EVENTS

NEST^{et}2008 - Call for Papers

BUDAPEST, HUNGARY 4 -9 May 2008

The NESTet 2008 Programme Committee and the European Nuclear Society (ENS) are calling for presentations for an important conference, dedicated to networking in **nuclear education and training** across the fields of engineering science and technology.

We invite both oral papers and poster presentations for the following thematical tracks:

- Science, Engineering and Technology in Education
- Training Programmes for Industry
- Experimental Facilities for Education and Training
- The Role of Education in Knowledge Management
- Radiation Protection

NESTet 2008 is designed to facilitate an exchange of information, collaboration and the sharing of best practices in **nuclear education and training** in engineering science and technology.

Respond now to the challenge of maintaining nuclear knowledge and ensuring there is a suitably qualified nuclear workforce for the future; send your abstract **by 15 January 2008** to the NESTet Programme Committee!

Help us spread the news about NESTet 2008 and make sure your colleagues get to know about the conference through our website or via this e-mail.

NESTet 2008 Conference Secretariat

www.nestet2008.org

nestet2008@euronuclear.org

---

http://www.euronuclear.org/e-news/e-news-19/topsafe2008.htm

ENS EVENTS

TopSafe 2008 – Call for Papers!

The ENS Conference on Safety of Nuclear Installations will take place in Dubrovnik, Croatia from 1 – 3 October 2008.

The conference will provide a forum for addressing the current status and future perspectives with regards to safety at nuclear installations worldwide. It is organized in cooperation with the Croatian Nuclear Society (HND).

The TopSafe 2008 Programme Committee and the European Nuclear Society (ENS) are NOW calling for presentations. We invite both oral papers and poster presentations for the following thematical tracks:

- Safety issues of operating power plants
- Safety issues of future power plants
- Safety issues of research reactors
- Fuel Cycle Facilities Safety

Instructions for authors

Please download the TopSafe 2008 Abstract Form at www.topsafe2008.org

Authors should submit their abstract text electronically by email, in English on one page (400 words) using Microsoft Word format (.doc),
By:

29 February 2008

Deadlines

- Notification of abstract's acceptance: 15 March 2008
- Full paper submission: 31 May 2008
- Notification of paper's acceptance: 30 June 2008
- Final paper submission: 31 August 2008

Email ALL correspondence to topsafe2008@euronuclear.org

Publication Policy

Your paper contribution will be included in the Conference Proceedings (Transactions) that will be available on CD-ROM (after the conference) and posted on the conference website:

www.topsafe2008.org

Reference number: ISBN 978-92-95064-06-5

Selected papers will be proposed for publication in international journals.

Abstract review

The abstracts received will be reviewed under the auspices of the TopSafe Programme Committee. Authors will be notified of abstract acceptance by 30 June February 2008.

TopSafe Programme Committee

F. D'Auria (University of Pisa, Italy), Chairman
N. Cavlina (University of Zagreb, Croatia), Vice-Chairman

Conference Organiser
European Nuclear Society
contact: Kirsten Epskamp
Rue de la Loi 57
1040 Brussels, Belgium
Tel. + 32 2 505 30 58

topsafe2008@euronuclear.org

www.topsafe2008.org

http://www.euronuclear.org/e-news/e-news-19/icapp.htm

MEMBER SOCIETIES

2006 International Congress on Advances in Nuclear Power Plants

Embedded International Topical Meeting at the 2006 ANS Annual Meeting

ICAPP '06 • June 4-8, 2006 • Reno, NV • Reno Hilton
University of Florida

Dryout of BWR Fuel Elements

Frigyes Reisch Nuclear Power Safety, KTH Royal Institute of Technology, Stockholm, Sweden
Phone/fax +46 8 7202365
Frigyes@safety.sci.kth.se

1. INTRODUCTION

The surface temperature of the fuel limits the power production of nuclear reactors. Intense high temperatures can damage the fuel cladding and cause a radioactive release and even provoke in-vessel accident resulting in particulate debris bed, or core melt down. Therefore, identifying the uppermost permitted surface temperature in a Light Water Reactor (LWR) is of great importance. The experiments described here define the maximum permissible power production of Boiling Water Reactors (BWR) fuel element without the risk of burnout. As witnessed by a great number of publications, the search is going on for reliable criteria to assure the safety of the fuel. Here one such criteria is analysed. Normally the fuel surface is effectively cooled by boiling water. However, when the heat flux exceeds a critical value the heat transfer from the fuel surface into the coolant deteriorates, with the result that a drastically increased fuel surface temperature occurs. Excessive fuel temperature can be caused by overpower or reduced coolant flow. At neutronics and thermal-hydraulic power oscillations when the duration of the power peaks are very short, temporary high temperature can occur without causing fuel failures as normal cooling can quickly recover. To avoid excessive fuel temperature, the knowledge of the onset of the overheating phenomena is absolutely necessary, both at the design stage and during the safe operation of a reactor. There are complex correlations especially developed for specific fuel bundle designs. These correlations contains surface power, mass flow, system pressure and other parameters. While analyzing the test results it was

recognised that a single parameter, the void, characterises the onset of the overheating phenomena in a wide range of pressure and flow conditions. These results were attained from the experimental loop especially developed to study the dryout of BWR fuel elements.

2. **MECHANISMS OF CRITICAL HEAT FLUX**

Normally the fuel surface is effectively cooled by boiling water. However, if the heat flux exceeds a critical value the heat transfer from the fuel surface into the coolant that deteriorats, with the result a drastically increased fuel surface temperature occurs. The mechanisms of critical heat flux are:

a) Formation of hot spots under a growing bubble. Here when a bubble grows at the heated wall a dry patch forms underneath the bubble as the micro-layer of liquid under the bubble evaporates. In this dry zone, the wall temperature rises due to the deterioration in heat transfer.

b) Near-wall bubble crowding and inhibition of vapor release. Here a “bubble boundary layer” builds up on the surface and vapor generated by boiling on the surface must escape through this boundary layer. When the boundary layer becomes too crowded with bubbles, vapor escape is impossible and liquid cannot penetrate to the heated wall and cool it, the surface becomes dry and overheat gives rise to burnout.

c) Dryout under a slug or vapor clot. In plug or slug flow, the thin film surrounding the large bubble may dry out giving rise to localized overheating and hence burnout. Alternatively, a stationary vapor slug may be formed on the wall with a thin film of liquid separating it from the wall, in this case, localized drying out of this film gives rise to overheating and burn out.

d) Film dryout in annular flow

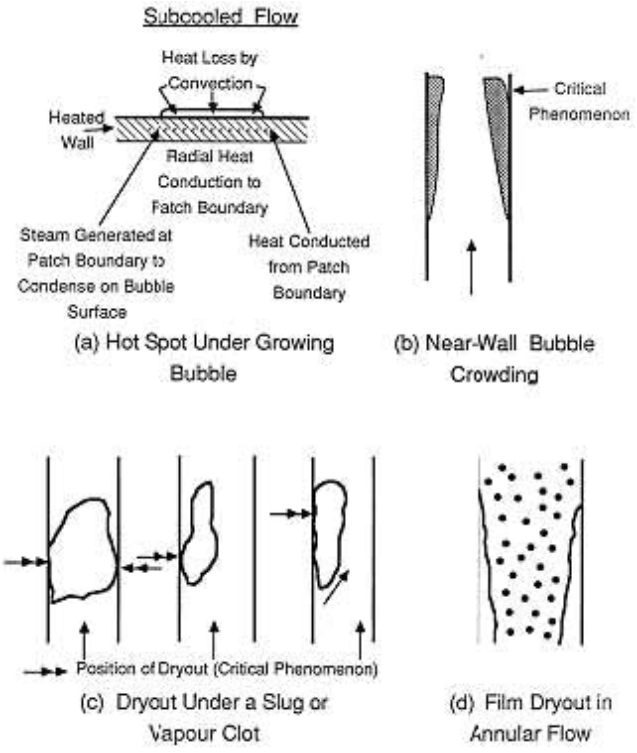


Figure 1. Critical Heat Flux Mechanisms

3. EXCESSIVE FUEL TEMPERATURE

Excessive fuel temperature can be caused by overpower or by reduced coolant flow. At thermal power and/or hydraulic oscillations when the power peaks and/or the flow reductions are very short and few, temporary over temperature (above the designed limit) can occur without causing fuel failures as normal cooling can quickly recover. To avoid excessive fuel temperature, which can cause damage to the fuel, knowledge of the onset of the over heating phenomena is absolutely necessary, both at the design stage and during the safe operation of a reactor. There are complex correlations especially developed for specific fuel bundle designs. These correlations contain surface power, mass flow, system pressure and other parameters. While analyzing the test results for a single fuel pin in water and steam in an annular test section, it was recognized that a single parameter, the void, is characterizing the onset of the overheating phenomena regardless which critical heat flux mechanism occurred.

4. MEASUREMENTS

Measurements were been carried out in a two-phase flow test loop consisting of two heated concentric tubes, the central one representing a fuel rod while the outer pipe emanates the heating power corresponding to the surrounding fuel rods in a reactor core. This loop with an anular test section height of 7 m is presently located at the Division of Nuclear Engineering, KTH, Royal Institute of Technology, in Stockholm and has been in operation for some thirty years first at the Studsvik research establishment and then at KTH to simulate thermal hydraulic conditions in Boiling Water Reactors. (**Figure 2**)

Total Power: 1 MW
Total mass flow rate: 1 kg/s
Max pressure: 25 Mpa.
Max lengt of the test section: 7m.

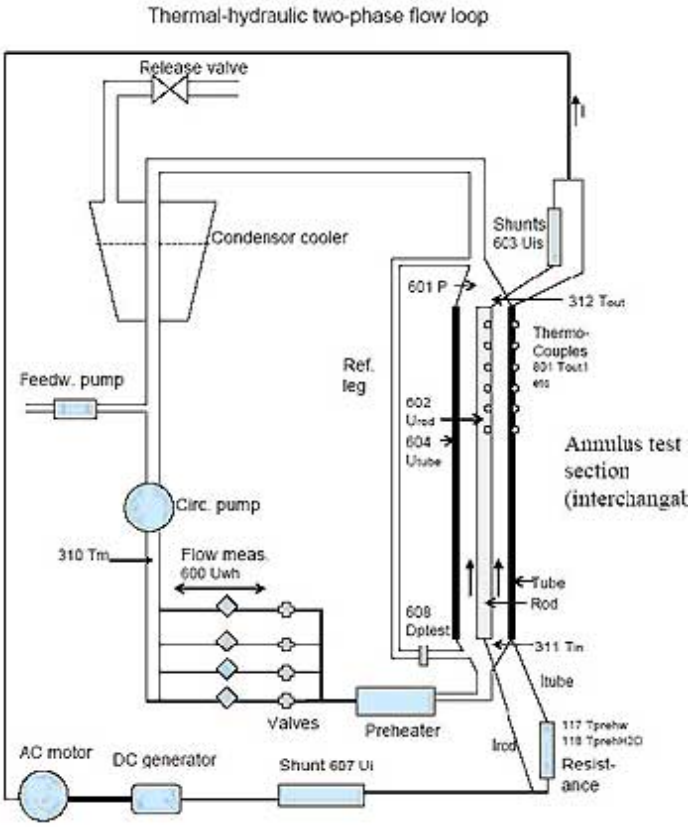


Figure 2. The loop and the test section

5. TEST RESULTS

The results of these tests were studied to investigate the occurrence of the onset of the excessive temperature on the surface of the inner and outer test tubes in this annular flow system. The tests covered pressures of 30, 50 and 70 bar; sub-cooling 10ºC and 40ºC; mass velocities between 250 and 2250 kg/m^{2}s and a total input power up to 580 kW, in this case with uniform power distribution. The tests have been repeatedly performed in an annular test section with a single fuel rod furnished with pin spacers, and 7 and 6 grid spacers alternatively. Then the test results were evaluated. To calculate the steam quality, the continuity, the heat and mass balance equations were applied.

The Continuity Equations

Heat balance

$$\mathbf{Q}_{\text{total input}} = \mathbf{Q}_{\text{subcooling to saturation}} + \mathbf{Q}_{\text{steam building}} \quad (1)$$

Q heat
$\mathbf{Q}_{\text{subcooling to saturation}}$ heat used to increase the temperature of the subcooled water to saturation temperature
$\mathbf{Q}_{\text{steam building}}$ heat used for vaporization of part of the saturated water to steam
Mass balance

$$\mathbf{W}_{\text{inlet water}} = \mathbf{W}_{\text{exit water}} + \mathbf{W}_{\text{exit steam}} \quad (2)$$

W mass flow

The general definition of steam quality, sometimes called steam value is:

$$\mathbf{x} = \mathbf{W}_{\text{steam}} / (\mathbf{W}_{\text{water}} + \mathbf{W}_{\text{steam}}) \quad (3)$$

To calculate the void three known slip correlations; Kirilov, Thoms and Zivi were used. The authors reached different results indeed, however this does not influence the conclusions of this paper. (**Figure 3**).

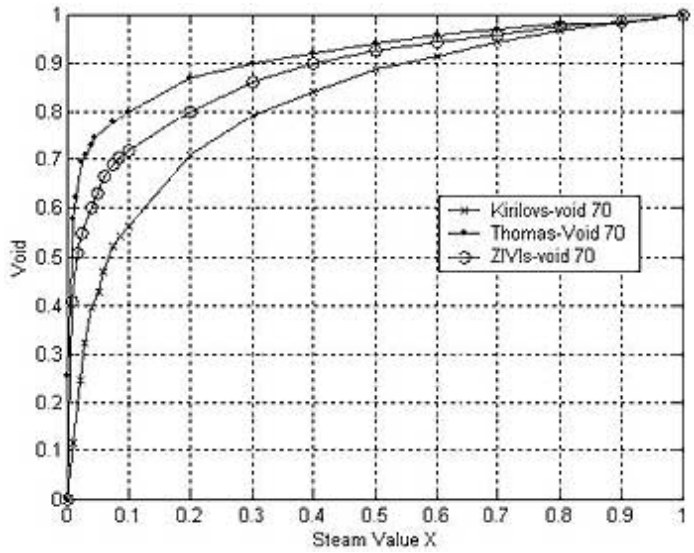


Figure3. Comparison between different void correlations as a function of steam quality

The most important result is, **that at the onset of the excessive surface temperature the void value changes merely between 0.88 to 0.99, while the steam quality changes in a wide range from 0.45 to 0.75** (**Figure 4**)

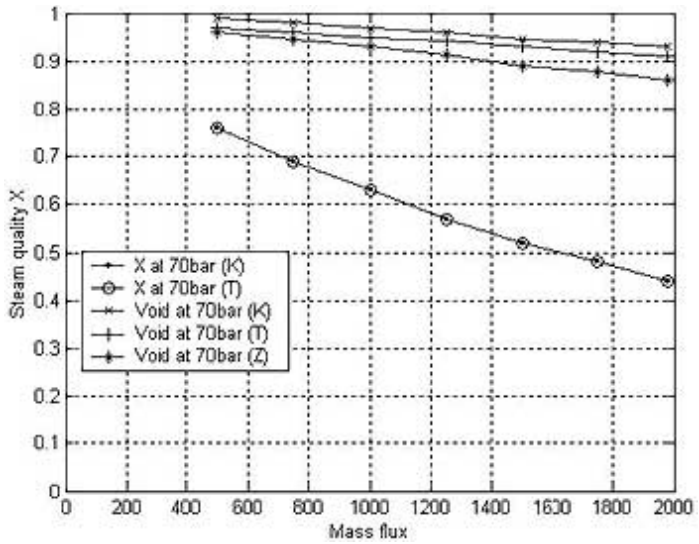


Figure 4. Void and Steam Quality as a Function of Mass-Flow at the Onset of the Abrupt Surface Temperature Increase

There has been knowledge of this, however - according to this author's but this has not been explicitly outlined. This helps to focus on the void when planning further test loop experiments, as well as when monitoring the safety of operating reactors and when designing new fuel assemblies. By using the constraitns described here -limiting the permissible void content - damage of the fuel can be avoided.

6. **AVOIDING EXCESSIVE FUEL TEMPERATURE**

The awareness of this result helps the design of a tool to avoid excessive fuel surface temperature and clad failure in operating reactors. To monitor the void during operation is presently not feasible, however from the measured parameters, power, power distribution, coolant flow, pressure etc. the steam quality everywhere in the core can be calculated continuously and the void can be deduced using steam quality versus void correlation derived from loop experiments. It is interesting to note that an analytical model is described in the literature. The mathematics is applied for a Freon loop and the deduced figures coincide with the measurements from the experimental loop mentioned above. The results are summarized in Figure 5. The abrupt increase of the temperature here too occurs when the void value reaches around 90% for a wide range of subcooling.

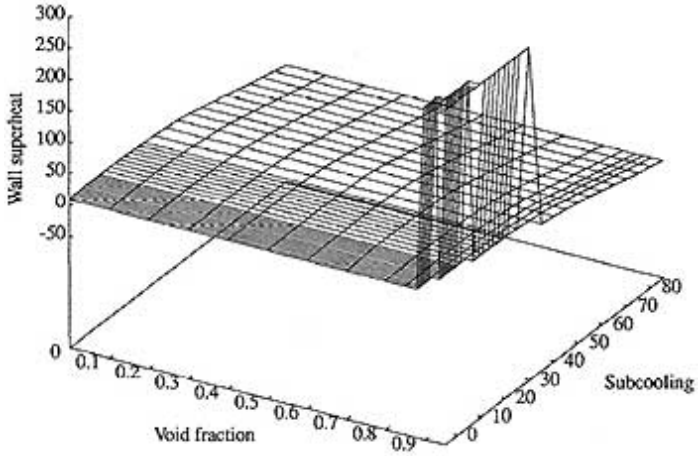


Figure 5. Prediction of critical heat flux for Freon at p=1.5 bars, q "= 190 kW/m^2 at constant liquid velocity of 0.5 m/

7. CONCLUSIONS

A series of experimental investigations on the maximum permissible power production of Boiling Water Reactors (BWR) and the effect of it on the fuel element's surface temperature was performed at the test facility located at KTH, Royal Institute of Technology in Stockholm, Sweden. The results show that the "void" is the principal parameter for defining the onset of the excessive surface temperature phenomena leading to burnout of a fuel rod.

http://www.euronuclear.org/e-news/e-news-19/two-phase-flow.htm

Two Phase Flow
Test Loop Results for BWR

Frigyes Reisch
Nuclear Power Safety, KTH, Royal Institute of Technology
Stockholm, Sweden
Seminar

Conclusion of loop test results;
the "void" is the principal parameter to define the onset of the excessive surface temperature phenomena of a fuel rod

Normally the fuel surface is effectively cooled by boiling water. However if the heat flux exceeds a critical value the heat transfer from the fuel surface into the coolant deteriorates, with the result that drastically increased fuel surface temperature occurs. According to Michael L. Corradini University of Wisconsin, Madison WI the "mechanisms of critical heat flux" are:

a) Formation of hot spot under a growing bubble, near-wall bubble crowding and inhibition of vapor release. Here, when a bubble grows at the heated wall, a dry patch forms underneath the bubble as the micro-layer of liquid under the bubble evaporates. In this dry zone, the wall temperature rises due to the deterioration in heat transfer.
b) Near-wall bubble crowding and inhibition of vapor release: here, a 'bubble boundary layer' builds up on the surface and vapor generated by boiling at the surface must escape through this boundary layer. When the boundary layer becomes too crowded with bubbles, vapor escape is impossible and the surface becomes dry and overheated, giving rise to burnout.
c) Dryout under a slug or vapor clot. In plug or slug flow, the thin film surrounding the large bubble may dry out giving rise to localized overheating and hence burnout. Alternatively, a stationary vapor slug may be formed on the wall with a thin film of liquid separating it from the wall; in this case, localized drying out of this film given rise to overheating and burnout.
d) Film dryout in annular flow. Here, in annular flow, the liquid film dries out to evaporation and due to the partial entrainment of the liquid in the form of droplets in the vapor core.
Excessive fuel temperature can be caused e.g. by overpower or reduced coolant flow. With neutronics and thermal-hydraulic power oscillations when the duration of the power peaks are very short temporary over temperature can occur without causing fuel failures as the normal cooling can quickly recover.

To avoid excessive fuel temperature, the knowledge of the onset of the overheating phenomena is absolutely necessary, both at the design stage and for the safe operation of a reactor. There are complex correlation especially developed for specific fuel bundle designs. These correlatoins are containing; surface power, mass flow, system pressure and other parameters. While analyzing recent test results it was recognized that a single parameter the void is characterizing the onset of the overheating phenomena.

CHF (Critical Heat Flux) Mechanisms

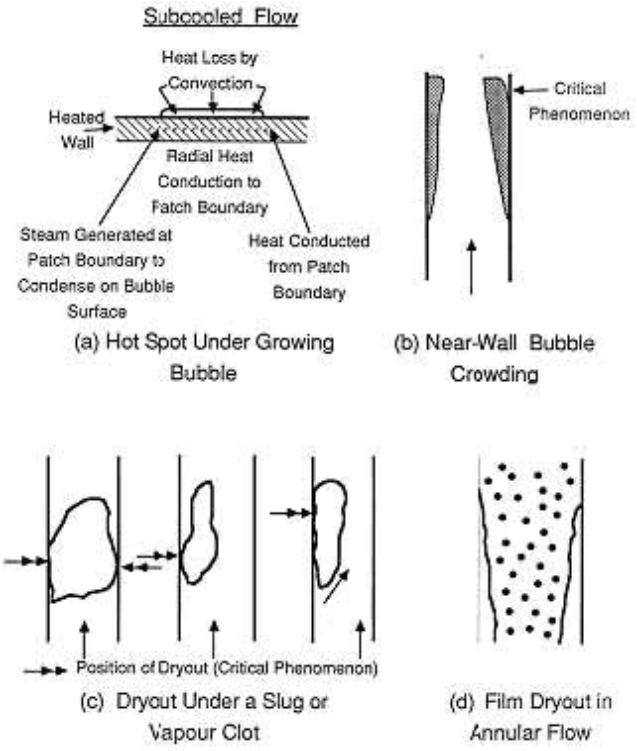
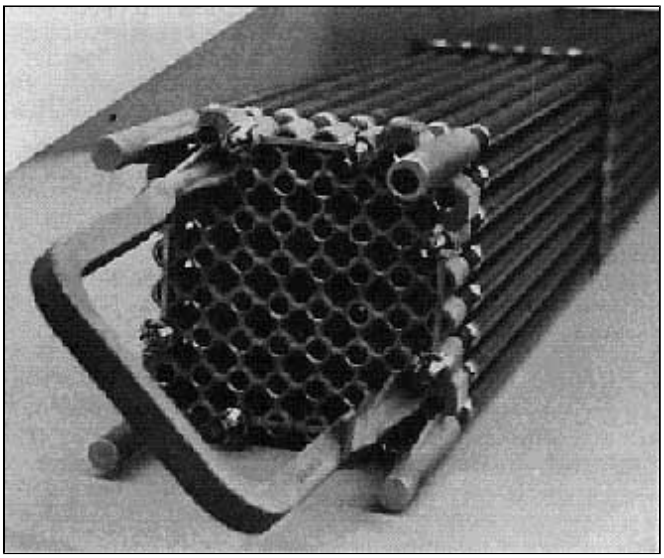
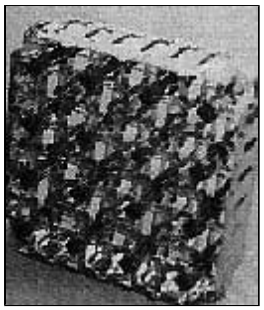


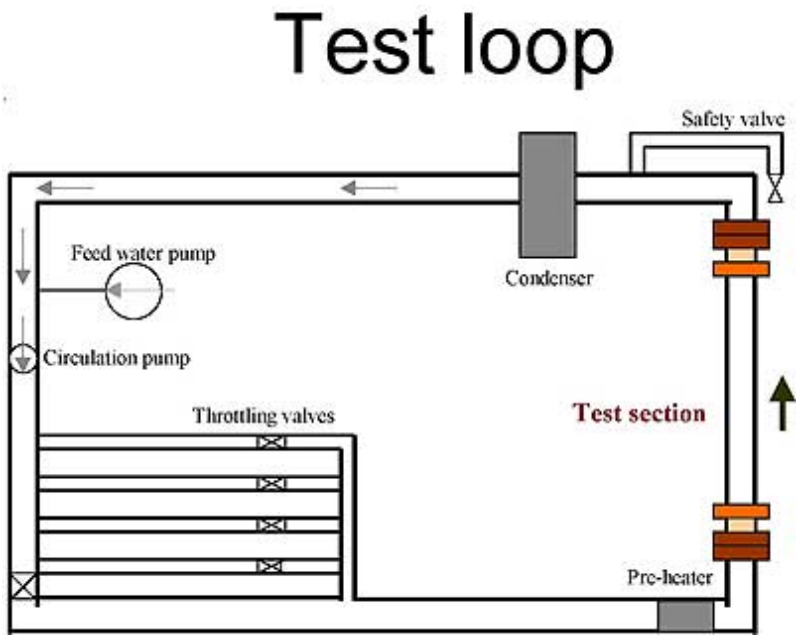
Figure 1. Critical Heat Flux Mechanisms



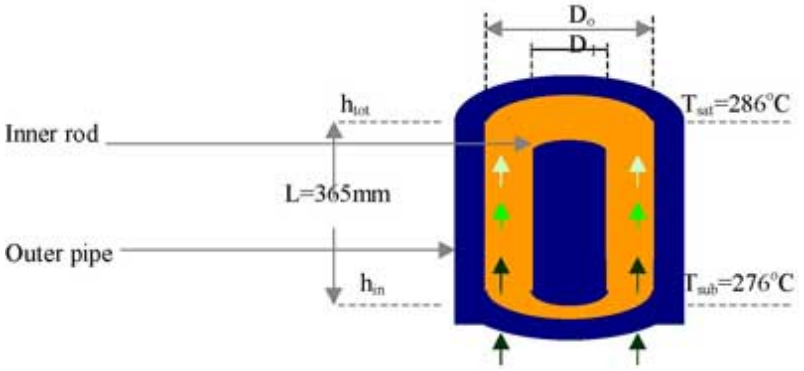
BWR fuel spacer



Measurements have been carried out in a two-phase flow test loop consisting of two heated concentric tubes, the central one representing a fuel rod while the outer pipe emanates the heating power corresponding to the surrounding fuel rods in a reactor core. This loop has been in operation for some thirty years to simulate thermal hydraulic conditions in Boiling Water Reactors. A wealth of data has accumulated during this time and has helped to enable BWRs to be operated safely and economically.



Test loop cross section



The results of the recent tests were studied to investigate the occurrence of the onset of the excessive temperature on the surface of the inner - and outer test tubes in htis annular flow system. **The test covered the pressures of 30, 50 and 70 bar; sub-cooling 10° C and 40°C; mass velocities between 250 and 2250 kg/m^{2}s and a total**

input power up to 580kW with uniform power distribution. The tests have been repeatedly performed with pin spacers, and 7 and 6 grid spacers. Then the test results were evaluated. To calculate the steam quality, the continuity - i.e. the heat and mass balance equations were applied. To calculate the void three known slip correlations; Kirilov, Thom and Zivi were used (Fig.1). Kirilov is the most recent one. The most important result is, **that at the onset of the excessive surface temperature the void value changes merely between 0.88 to 0.99, while the steam quality changes in a wide range from 0.45 to 0.75** (Fig.2). This means that the occurrence of the onset of the excessive surface temperature is basically dependent on the void. The performed analysis shows the same results regardless which correlation is employed and are valid at all the actual pressures, subcooloings, mass flows, spacer types and their positioning along the test section. There has been an awareness of this however - according to the author - but it has not yet been explicitly outlined. This help to focus on the void when planning furher test loop experiments as well as when monitoring the safety of operating reactors and fuel design.

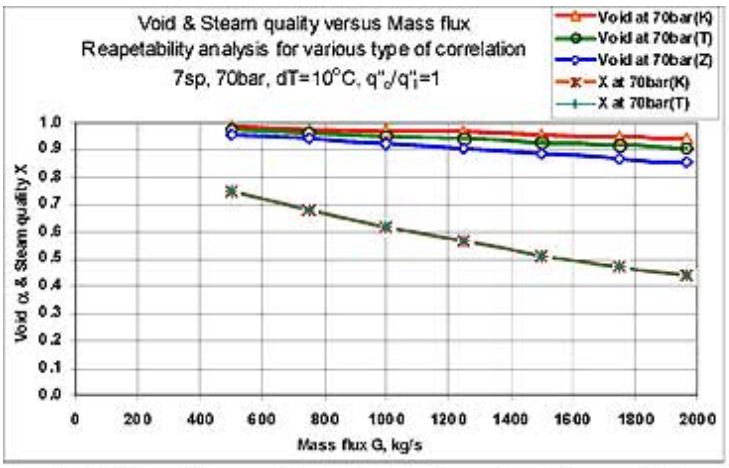


Fig.2, Void and steam quality as a function of mass-flow at the onset of abrupt surface temperature increase.
Comparison between different void correlation

The awareness of this result helps with the design of a tool to avoid excessive fuel surface temperature and clad failure in operating reactors. To monitor the void during operation is not feasible, however from the measured parameters, power, power distribution, coolant flow, pressure etc. the steam quality everywhere in the core can be calculated continuously and the void can be deduced using steam quality versus void correlation from loop experiments. By using the constraints described here - limiting the permissible void content - damage of the fuel can be avoided.

Curiously it can be noted that an analytical model is described in the DOE rapport KAPL-P-000160 by Alajbegovic, et.al. The mathematics are applied for a Freon loop and the deduced figures coincide with the measurements from the experimental loop. The results are summarized in Figure 3. The abrupt increase of the temperature here too occurs when the void value reached around 90%.

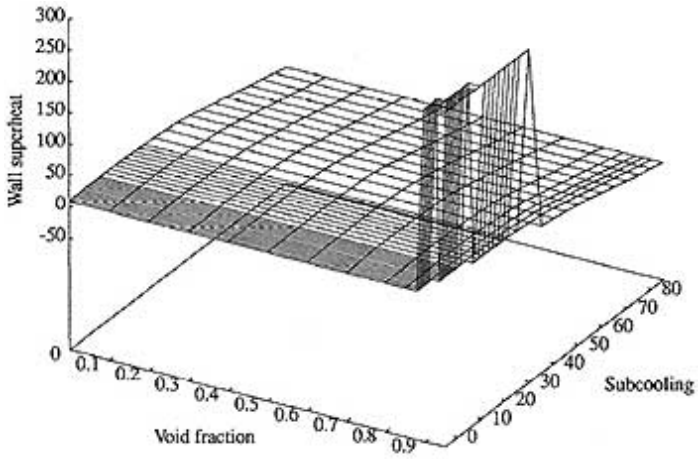


Figure 3. Prediction of critical heat flux for Freon at p=1.5 bars, q "= 190 kW/m^2 at constant liquid velocity of 0.5 m/

---

http://www.euronuclear.org/e-news/e-news-19/future-of-nuclear.htm

MEMBER SOCIETIES

The Future of Nuclear Energy

by Frank Deconinck

The future of nuclear-energy looks ever brighter. Indeed, more and more countries are expressing their interest in nuclear, and the recent announcement by the British government will certainly give an extra boost to hesitating governments. Is it correct, in this context, to speak about a "nuclear renaissance"? In my opinion, not entirely.

It is certainly true that no new plants have been built in the US or in Western Europe for the last 20 years and that several countries announced their intention to phase out nuclear. In Eastern Europe, the situation had already become less anti-nuclear. The fact that there was no new build, was not so much due to internally generated political decisions, but rather was imposed by the EC, or because of economical reasons. Further east, nuclear continued to be developed at a high pace. For us to speak about the nuclear renaissance, therefore, seems much too self-centred.

A second reason is that, in Europe, we know what "renaissance" means. Not the American 'born again' concept: nuclear was never dead! Rather, nuclear was hibernating in our countries and it is now slowly waking up again (climate change?). In Europe, the 'Renaissance' stands for the development of education and research after the dark Middle Ages. This ame about first through the study of the Greek

classical authors, and then through our own scientific discoveries. An emblematic figure here is Leonardo da Vinci. Painter, engineer, scientist, philosopher, ... a genius with a global view on everything he studied. The same global approach remained until the start of the 19th century and the age of industrialisation: Joseph Fourier was first a mathematician then physicist who first described greenhouse gasses then he was also an Egyptologist working for Napoleon and an administrator in the Isère department in France.

Since the start of the industrial world, enormous progress has been achieved in science and technology, but the gap between disciplines has been widening steadily. Ever higher ivory towers were built in universities and interaction with society was gradually lost. During the twentieth century nuclear did not escape this trend. Nuclear scientists were often bound to secrecy, and most of them did not consider it as their duty to reach out to society.

Recently, there has been a fundamental change going on: nuclear has become more and more open and transparent, and there is a growing conscience that nuclear is not only about technology, but that human and societal aspects are also essential and have to be integrated in all projects. This is a real break with the past and, in my opinion, a very positive evolution that may well be the start of the real 'nuclear renaissance'.

---

http://www.euronuclear.org/e-news/e-news-19/westinghouse.htm

MEMBER SOCIETIES

NUCLEAR SERVICES rapid release Westinghouse

Westinghouse is Awarded Watts Bar Units 2 Completion Contract

Westinghouse Electric Company has won a contract valued at approximately $200 million for scope in support of the completion of TVA's Watts Bar Nuclear Plant Unit 2, which is located near Spring City, Tenn.

Westinghouse's scope includes: upgrade and replacement of most I&C systems, supply of new reactor coolant pumps, steam generator services, crane replacement and upgrades, Probabilistic Risk Assessment (PRA), NSSS plant design engineering services, drive rods, licensing services and safety analysis. The TVA-planned project duration is 54 months with commercial operation of the unit scheduled for early 2012.

Watts Bar Unit 1 -- the last commercial nuclear unit in the United States to come on line in the 20th century -- began full commercial operation in 1996.

Watts Bar Unit 2, a Westinghouse Pressurized Water Reactor (PWR), was approximately 80-percent complete when the utility halted construction in 1985, citing a projected decrease in electricity demand. In 2007, TVA announced that it would complete Unit 2 and that Bechtel Power Corp. would lead the engineering, procurement and construction work. Westinghouse was invited to develop a proposal relative to our potential project scope.

“We are so pleased to be part of this important project, which is yet another positive for the nuclear industry,” said Ric Pérez, senior vice president, Westinghouse Nuclear Services.

Work will begin immediately on long lead and critical path items such as reactor coolant pumps, I&C safety systems, PRA and modifications to existing cranes to support site activities. When completed, Watts Bar Unit 2 will provide more than 1,200 megawatts of electricity - enough power to serve about 650,000 Tennessee Valley homes.

Westinghouse, a group company of Toshiba Corporation, is the world's pioneering nuclear power company and is a leading supplier of nuclear plant products and technologies to utilities throughout the world. Westinghouse technology today is the basis for approximately one-half of the world's operating nuclear plants.

TVA is the nation’s largest public power provider, supplying power to large industries and 158 power distributors that serve approximately 8.7 million consumers in seven southeastern states.

January 18, 2008

---

http://www.euronuclear.org/e-news/e-news-19/bgns.htm

MEMBER SOCIETIES

Bulgarian Nuclear Society Annual Conference ‘ Nuclear Power for the People’

by Todor Madolev, BgNS

Scientific Support for Nuclear Energy and Medical Radiology were the general topics discussed at the 2007 conference of the Bulgarian Nuclear Society (BgNS), held in Plovdiv town, 14-17 November 2007, under the patronage of the Bulgarian Nuclear Safety Agency.

The discussions and conclusions of the conference addressed the main challenges forcing the Bulgarian nuclear community: the construction of Belene NPP and refurbishment of the research reactor in Sofia.

The participation of young scientists and specialists, among many world-famous nuclear experts, was notable and some of their best presentations and posters received awards. The first prize was won by Ivelina Dimitrova for her presentation “Desorption of 222Rn from Polycarbonate Samples”, and the second, by S. Geirgiev for his presentation entitled “Calibration of Diffusion Chambers for Measuring 222Rn in Air”, both from the Department of Atomic Physics, Sofia University “St. Kliment Ohridski”. The third prize went to D. Kirilova from the Institute for Nuclear Research and Nuclear Energy of Bulgarian Academy of Sciences who presented a poster entitled “Conformity between LR0 mock-ups and VVERs NPP RPV attenuation”.

Thanks to Prof. F. Deconinck, the following important presentations were given:

- ***Nuclear Imaging in the Realm of Medical Imaging***, by Frank Deconinck, SCK-CEN, Belgium;

- ***New UN Estimates of the Health Effects of Radiation Exposure, and The Latest International Radiation Protection Recommendations***, by Abel J. Gonzalez, UNSCEAR Representative and ICRP Commissioner, Argentina;

- ***European Higher Education in Nuclear Engineering: Current Trends,*** by Michel Giot, SCK-CEN, Belgium;

- ***PET/CT: A Winning Combination,*** by Hendrik Everaert, University of Brussels, Belgium.

The round table debate entitled '***Public Relations in the Nuclear***' was jointly organized with the Ukrainian Nuclear Society. High-level experts took part. The round table 'Challenges towards the Education in the Nuclear Field' gave an opportunity for some other hot issues to be put under the microscope.

Both round tables were deemed not only of fundemental importance for Bulgaria but also a corner-stone for human resources involvement, necessary to meet the demands of the nuclear energy renaissance and its modern application in medicine and industry. It was concluded that the fulfillment of the complex tasks for the world development of nuclear education needs the support of international cooperation and that ENS member societies and ENS itself have to take the initiative in this important mission.

---

http://www.euronuclear.org/e-news/e-news-19/cop13.htm

MEMBER SOCIETIES

Bali COP13 and beyond - The debate on nuclear at the UN climate change meetings is dead, but does anybody care?

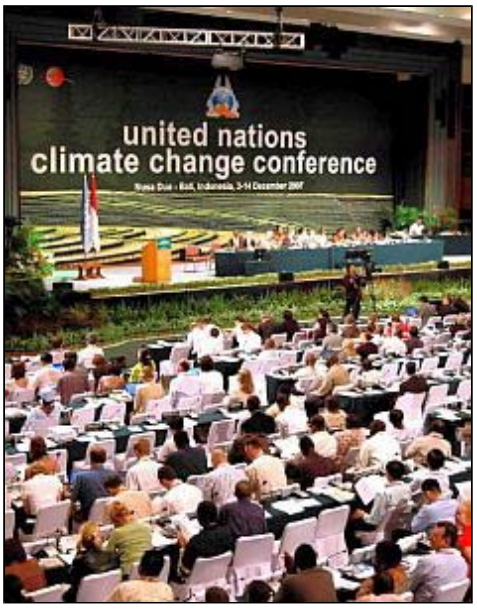
by Gaston Meskens

Looking back at the outcomes of the latest United Nations climate change conference, in Bali last December, it would be easy to join forces with the numerous pessimistic voices complaining about the noncommittal character and degree of informality of the 'decisions' made by the political delegations. Indeed, the Bali Action Plan is essentially 'an agreement on a working agenda' for the next two years. It aims to launch inclusive negotiations on the post-2012 period and is scheduled to end in 2009. Although the wording and the plan itself appear vague, the word 'inclusive' is important as it indicates that both the United States and the developing countries will join around the table, together with the states that are committed to the Kyoto Protocol. The discussions will focus on a long-term goal for global greenhouse gas emissions reductions and on enhanced action on “mitigation”, “adaptation”, “technology development and transfer” and “finance and investment”. Finally, the Bali outcome also delivered an agreed text on deforestation, technology transfer, adaptation and carbon markets.

In addition to the deal’s 'character of inclusiveness', another aspect might be perceived as positive. Never in the history of the United Nations Framework Convention on Climate Change (UNFCCC) negotiations, has a working agenda been so short-term and detailed. The first post-Bali meeting of comparable importance in terms of content and international character is supposed to take place '…as soon as is feasible and not later than April 2008'[1]. Truly, going beyond simple optimism, this way of tackling the issues could well be seen as a make-or-break deal. But in whose interest is it? By the time of the next COP meeting, in Poznan, Poland in 2008, the world will know whether the Bali Action Plan is a success or a failure.

While there are reasons for optimism about the way the global talks proceeded, this text reveals a certain concern about the debate on nuclear within the frame of the climate change negotiations. Those who are familiar with UN climate change meetings shrug their shoulders, while others might be shocked to hear that up until now nuclear has, in fact, never been a subject of debate or considered part of the official negotiations within the framework of the global climate change meetings. The well-documented exclusion of nuclear from the basket of technologies eligible for the Clean Development Mechanism has mainly been debated on the fringes of the meetings - in corridors and restaurants around the conference centre. What’s more, the political delegations have never made a serious effort to bring the issue to the debating

table in a constructive and open way. To put it straight: after many years of hushing up the issue in the official negotiations and an erosion of the quality of the debate on 'content' , one can say that, since Bali, the debate on nuclear in the context of international negotiations on climate change appears dead. The obvious question follows, is it really an issue of concern for both the political delegates and the nuclear community?



On December 13, around lunchtime, two official nuclear side events were simultaneously organised within the conference premises. While the World Nuclear Association organised an event that focussed on ***Indonesia's approach to nuclear energy***, in another room at the conference centre, the Heinrich Boll Foundation (HBF) staged an event entitled ***Nuclear energy: myth and reality***. The WNA event featured, among its speakers, the Indonesian Minister for Women Empowerment. The HBF event presented expert views from Europe, Australia, Brazil, South Africa and India on 'the role of nuclear energy in combating climate change', and aimed to present alternatives based on their observation that '… as nations worldwide seek to reduce greenhouse gas emissions, nuclear energy is promoted as a solution to climate change'[2].

As the two events were taking place simultaneously and only a few rooms away from each other, I walked from one event to the other and back again, just to grasp what was going at in each event[3]. I must stress at this point that I do not want to question or criticise the intentions and professionalism of the organisers and speakers at both events. Instead, I would rather present what happened at the events as a metaphor for the overall state of the nuclear debate at climate change conferences[4].

What was interesting about the two events was that while the pro-nuclear event presented the case of several countries that have launched or considered launching nuclear, and promote nuclear technology as a valuable solution to climate change, the anti-nuclear event focused on the opposite by highlighting those countries that are phasing out nuclear or claim that it is a non-option. The WNA event focussed on Indonesia and on other countries in the East. The HBF event, however, stated that the situation in Europe is best proof of the fact that nuclear is no solution because no plants have been ordered in Europe for decades and countries like Belgium, Sweden and Germany are currently phasing out nuclear. Finland was presented as 'the exception that proves the rule'. In addition, the HBF event reported on cases of 'bad government policy' in Brazil, South Africa and India that are guilty of '…failing to involve civil society in a proper way…' in the debate about nuclear. They cite these examples to support their claim that nuclear offers no solution to climate change.

Having taken the time to reflect on what happened there, I would like to make some observations that, I believe, deserve further analysis and discussion. This text does not allow time for broader and deeper analysis in order to provide further evidence to back up my observations, but there will obviously be more opportunities to do this

later.

Summarising (and, admittedly, simplifying) 10 years of nuclear debate within the framework of the UNFCCC one can observe that the initial irritation and repugnance of the anti-nuclear lobby in the first years after the Kyoto conference was followed for many years by indifference and ignorance. The symbolic exclusion of nuclear from the CDM was regarded by most anti-nuclear NGO's as the final nail in the nuclear coffin. In recent years however, the nuclear community has found a new voice to articulate its message, encouraged by the 'nuclear renaissance' in the East and the West. During this period the starting point for the discussion was evidence of the emissions avoidance or reduction potential of nuclear energy. The focus of the debate switched roughly from technicalities and arguments about the risks of nuclear energy to discussions about policy and the economics of nuclear within the context of a 'climate-friendly' energy mix. In parallel, outside the UN negotiation rooms, some countries started to openly “show their hand” by explicitly favouring or rejecting nuclear in their national energy policies. As this anecdote shows these themes have been seized upon by NGO's at UN meetings.

My initial observation is that in international negotiations such as the UNFCCC conferences or the UN Commission on Sustainable Development meetings, countries keep on skirting around the nuclear issue instead of showing willingness to bring it in out into the open and discuss it in a transparent way. At the UN Commission on Sustainable Development (CSD1 that took place in New York in May 2007, the primary focus was on energy. Participating countries once again failed to take a joint position on nuclear, not because of ‘the complexity of the issue’, but because it simply wasn’t discussed. Many countries (to some degree supported by the EU position) do share the common view, however, that the responsibility for deciding whether or not to include nuclear in national energy policies should be made at the national level. A few months after CSD15 however, the Global Nuclear Energy Partnership (GNEP) announced that already 16 nations had agreed to sign up for GNEP. Another 22 countries were candidate partners and observers, making a total of 38 countries that are somehow involved with GNEP (see Nucnet 2007-10-02). Other countries that have joined GNEP since then are Canada, the Republic of Korea and Italy, the latter being one of the countries that has traditionally spoken out against nuclear at previous climate change meetings.

Recent developments have clearly shown that countries refrain from taking a position on nuclear in the context of international political commitments but do increasingly show, however, an eagerness to strengthen their position in the global economy by 'tuning' into international nuclear research and development programmes. Interestingly, the initiatives on involving civil society in the siting process for radioactive waste disposal sites provide further evidence for this line of thinking. Although it is of course the fundamental right for local citizens to become (voluntarily) involved in a proposed siting process, one can observe that participation remains confined to the local level, instead of enlarged to the national level, and that the participatory siting process remains deliberately decoupled from the (nuclear) energy debate.

The second observation is that the debate on nuclear 'in the observer arena' of international political meetings such as those of the UNFCCC and CSD is hollow and virtually dead (as suggested in the introduction). It will remain so as long as both 'sides' make no effort to overcome their polarised positions. I am not suggesting here that both sides should sit around the table and talk things through. We all know that this has been tried many times before, without success. The water that separates the two is generally perceived to be too deep. Today, the alternative approach of both sides appears to be to advocate their case by making reference to (good or bad) political practices, hereby paradoxically building on positions of countries that fail to stand up for those positions themselves in official negotiations. For the observer debate, or the scientific and social debate in general, the result is that both sides continue 'to talk next to each other', in Bali this literally meant in adjacent rooms.

By now, the reader might wonder where this story is leading to, especially in view of what I suggested in my introduction, one might think that there is no problem at all. Knowing that nuclear can be competitive in certain conditions companies will only invest in it if there is a legally binding framework and if it backed up by stable national political support in their particular country. In the face of climate change, many countries show (again) support, which makes mid- to long term investment (again) interesting. Whether this 'nuclear renaissance' is a reality or rather a self-fulfilling prophecy of the industry is a subject of reflection that goes beyond the scope of this text.

My central thesis here is to point out that there is a fundamental flaw in the reasoning of many nuclear communities (advocacy groups, industry and research), their anti-nuclear opponents and many politicians, including some who are in favour of nuclear. The flaw has to do with the way civil society should be 'engaged' in the social justification of complex risk-inherent technologies such as nuclear. Today, all policymakers, whether at industry, research or national and international political level, see 'societal support' as a prime condition for the justification of the use of complex risk-inherent technologies in general and of nuclear technology in particular. Never before, has civil society been more 'present' in the debate around nuclear than today. But this is the crux of the problem - its appearance is basically “virtual”: civil society is present as a 'subject', not as a partner. It is studied, questioned, psychologically mapped and categorised, all with the objective of adapting, fine-tuning and simplifying the information it needs to 'finally understand' and accept or reject the nuclear option. In all these efforts 'to get the message through', one forgets that the ultimate societal support may be found by engaging civil society itself 'bottom-up' in the actual policy process as such: 'joint problem solving' that should even be preceded by 'joint problem definition'. Instead of this, communication with civil society and the public at large is still seen as a 'next step' after round-up of the technology assessment exercise 'internally'. The result is that the nuclear and anti-nuclear communities and those politicians who are in favour of nuclear tend to do their work within their friendly little circles first, and then 'step outside' in order to seek acceptance for their 'product'.

Civil society is pre-determined and written into strategies according to the desired goal. The nuclear community wants to seek trust and confidence within civil society, but only by way of providing 'factual evidence' and transparent information on its activities, and not by inviting it to take part in a joint justification exercise. The anti-nuclear NGO's, for their part, see no need to double-check for trust and confidence with civil society for their activities and messages, as they quite simply claim to represent it.

While, for several reasons, we see national politics avoiding to engage civil society in

political deliberation on a national or international level, both the nuclear and anti-nuclear community now have the opportunity 'to give a good example'. To make my position clear, I am not arguing in favour of a broad societal debate on nuclear because I see this as a way to support nuclear (not as a way to phase it out), but because nuclear exists as a politico-economical dynamic that develops outside most citizens' considerations and remains separate from any need for joint societal justification.

The situation seems to be one of stalemate. While the anti-nuclear movements should do a critical self-assessment in order to find out if and how they actually 'represent' civil society in their anti-nuclear messages, the nuclear communities should invite civil society to take part in a justification exercise of which the outcome might well turn against them. Moreover, whereas it seems evident that it is not the pro- or anti-nuclear community that should initiate and organise societal debate, but that it is the responsibility of national and international politicians, we do see political dynamics hijacked by politicians' fear that they might be transcending their own short-term legislative commitments and by the very limits that a system of traditional representative democracy imposes on organising such societal involvement. Last but not least, to make matters worse, one might wonder what civil society actually is, and how it can be approached, organised and engaged in debate in a practical way.

Not surprisingly, there are no clear-cut answers or readily-available bullet-point recommendations for such a complex issue. One thing is certain, though, although we have to take these complexities and limitations seriously, they cannot be used as an excuse to escape responsibility, whomsoever on thinks is responsible for what. In addition, even if there were shared evidence of the need for a broad societal governance process, the question "why this process should especially be organised around nuclear, and not for other complex risk inherent technologies such as genetically modified crops or nanotechnology?" would have to be asked. The answer is, of course, that these technologies would also need to be subjected to a fully inclusive governance process.

The objective of this text was to raise awareness in a certain way of perceiving the situation, and to invite feedback and discussion. I dare to conclude by making another 'simple' statement. We all know it would be naïve to think we could try and replace the actual politico-economical rationality that "rules the world" with a new model of a more emancipated citizenry. There is simply no need to do so. Business and industry ask 'enabling frameworks' that should be guaranteed by politicians. It is in the defining and fine-tuning of these frameworks that civil society could be better engaged in, and this requires political will as well as motivation from research and from industry. Consider this: it makes no sense to organise inclusive reflection on the subject of nuclear energy outside a broad-ranging and comprehensive energy debate; a debate that also needs to link with other thematic issues that need to be tackled 'for the

better of society' such as water, climate change, health and agriculture. Advocates and opponents of nuclear should accept that the outcome of any inclusive political governance process could also prove to be a rejection or acceptance of nuclear. At least the decision will have been supported as robustly as possible.

Finally, it is worthwhile to do an assessment of nuclear technology 'from within" in order to study aspects of risk perception and governance, balances of benefits and burdens, responsibilities towards future generations and interconnections with the possible or actual misuses of the technology, such as proliferation and terrorism. The research should anyway be trans-disciplinary as well as inclusive. For those who might not know, this kind of research is already being carried out within the nuclear community, and it remains quite unique. Trans-disciplinary and inclusive analysis of nuclear can be carried out anywhere - in universities, in industry communication campaigns, in learned societies' working groups and within UN observer platforms. It costs virtually nothing, as all you only need is a brain, a certain engaged detachment (or detached engagement) and a sense of curiosity.

---

[1] Decision -/CP.13: Bali Action Plan. See this and other documents on unfccc.int/2860.php

[2] United Nations Climate Change Conference COP 13 and CMP 3 Bali, 3-14 December 2007; Daily Programme of 13 December 2007. See unfccc.int/meetings/cop_13/daily_programme/items/4162.php

[3] Speaking from experience with UN meetings, one could assume that the UNFCCC secretariat, in coordinating the agenda of side events, did not schedule the two events simultaneously 'by accident'.

[4] Traditionally, also the IAEA organises a nuclear event at every climate change meeting. While their intention is to take a neutral and factual stance 'by design', one can observe that obviously their interventions are perceived as 'pro-nuclear' by observers and delegates. As the example I give is meant as a metaphor for more general observations, a reflection on the effect of the contributions of the IAEA is beyond the scope of this text.

---

http://www.euronuclear.org/e-news/e-news-19/ygn.htm

MEMBER SOCIETIES

How to be seen better?
(Cross-branding with appreciated brands from other fields)

The search for alternative sources of energy has stimulated renewed interest in the peaceful use of nuclear technology. However, scepticism remains and obtaining public acceptance is of vital importance to the future of nuclear energy production. We should be proud that Hungary is one of the countries in Europe where the peaceful use of nuclear energy is the most accepted by the public.

The Paks Nuclear Power Plant (NPP), the only NPP in Hungary and operating with 4 units, is working on receiving a lifetime extension. Building new reactors has already been taken into consideration. However, opponents has taken a public stand against this life time extension and against even the peaceful use of nuclear energy.

In response to these criticisms, the Hungarian Nuclear Society (HNS) took the initiative and joined the well-known European Cultural Heritage Days held on 15-16 September 2007 by opening the doors of Hungarian nuclear facilities and the Hungarian Atomic Energy Authority.

This event got significant support from the media (newspapers, TV, radio). A special edition of a weekly publishd brochure was made. The participating institution distinctive signs for the Cultural Heritage Days, like badges for the local guides with the logo of the Council of Europe, a blue flag that was flown on the buildings, and a special poster advertising the visit.

During these days more than a thousand visitors got information about the peaceful use of nuclear energy. Visitors could learn about the activities of the HAEA and they were given a demonstration by the Centre for Emergency, Training and Analysis showing a typical response to an emergency situation. Visitors were allowed to enter the control room and the reactor hall of the Budapest Research Reactor and they became familiar with the state-of-the-art research programs on the peaceful use of nuclear energy. They could observe the final repository for low and interim level radioactive waste materials in Bátaapáti as well. The direct contact made it possible for the public to ask questions on any nuclear issues and the Institutions could gauge public opinion on their activities. The synergy achieved through this cooperation with the Cultural Heritage Days initiative was seen in the increasing number of people visiting both nuclear and non-nuclear sites.

---

http://www.euronuclear.org/e-news/e-news-19/bratislava.htm

MEMBER SOCIETIES

Bratislava's nuclear November

The last week of November 2007 in the Slovakian capital was simply designated as a "nuclear" week and most of us know why. From 26 to 27 November the inaugural European Nuclear Energy Forum (ENEF) was hosted by the Slovak government. It was very important event, but during this "nuclear week" a kind of different meeting was also organised, not on such high level, but indirectly connected with the ENEF. On November 26 a short technical seminar organised by the Slovak Young Generation Network members in collaboration with FORATOM took place.

The initial idea to organize such a meeting was thought of during the visit of Sami Tulonen, Director Institutional Affairs of FORATOM, in Bratislava on September 2007. We decided to use presence of FORATOM people on ENEF to give Slovak young nuclear professionals an overview of Foratom, ENEF, nuclear lobbying and EU energy policy. Over 25 members of the Slovak YGN from around 5 “nuclear” companies, institutes and the Technical University attended.

The seminar was kicked off by Sami Tulonen, who stressed the role of ENEF its benefits and important actions. Stella Brozek, FORATOM Institutional Affairs Manager, then gave an interesting presentation, which covered three main topics:

First she spoke about FORATOM, who they are, what they do and what are the FORATOM key activities and messages.

The second topic of her presentation was nuclear lobbying - opportunities and challenges. She showed us the political side of the nuclear power industry in EU and we discussed nearly everything about lobbying, from definition of EU lobbying, through the questions like “why is it important to be present in Brussels” or “why is lobbying often misunderstood” to lobbying in practice in the EU institutions, advantages of lobbying for the EU decision-making process and the importance of nuclear lobbying.

The final part of her presentation was devoted to EU energy policy. She presented information about High Level Group on Nuclear Safety and Waste Management, the Sustainable Nuclear Energy Technology Platform and the European Parliament Report on Conventional Energy Sources and Energy Technology "Reul Report".

After more than two hours of interesting presentations all participants were invited to go to comfortable cellar for refreshments, where in informal atmosphere we could continue with our discussion.

This short technical seminar of the Slovak YGN received avery positive feedback from all participants. One short remark was from one of them: “It was really interesting to have d a look at the nuclear power industry from different perspectives, FORATOM and yours”.

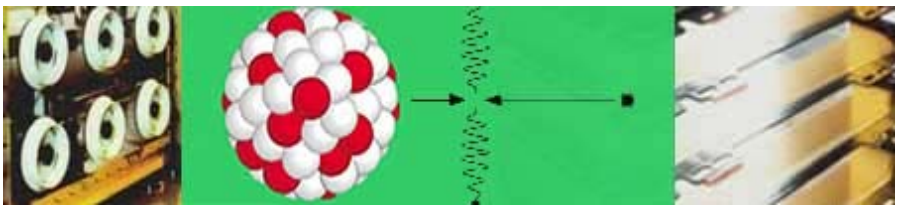
Milos Lascek
Chair of Slovak YGN

---

http://www.euronuclear.org/e-news/e-news-18/EU-energy-development.htm

EUROPEAN INSTITUTIONS

Summary of the main EU Energy Developments, 2007



This year, the EU institutions have launched a number of initiatives in the energy field. Here is a diary of all the events that have shaped the EU energy policy in 2007. These political development could have a direct impact upon how the nuclear science community works in the future and what its working enviroment will be like.

10 January: Publication of the EC “Energy Package”

On 10 January 2007, the European Commission (EC) presented an "energy package", which consists of a Communication entitled An Energy Policy for Europe, communications and reports on coal, biofuels, nuclear (the so-called PINC); a competition enquiry into electricity and gas markets and a green paper on climate change. The communication on energy policy and the PINC (Nuclear Illustrative Programme) clearly recognise the key contribution that nuclear energy makes to the achievement of the EU's security of supply, climate change and competitiveness goals. It also highlights how nuclear energy is and will remain a key component of the EU's energy mix.

You can find these documents in the Energy section of the Commission website. For further information, you can also read the PINC, the Communication from the Commission , and FORATOM press release.

9 March: Spring Council conclusions

The Council conclusions published on 9 March make a clear and unequivocal link between energy and climate change. The two main elements of the strategic approach that defines the post-2012 climate change framework are the strengthening and extension of global carbon markets and the development, deployment and transfer of the technology needed to reduce greenhouse gas (GHG) emissions. The major strategic components highlighted in the Conclusions are the adoption of two binding targets for EU Member States to reach by 2020:

- A 20% reduction of GHG emissions by 2020 compared to 1990 levels, which is consistent with the underlying policy objective of "transforming Europe into a highly energy-efficient and low GHG-emitting economy."
- A 20% share of the EU's total power share from renewable sources by 2020.

The implementation of these targets will be based on agreed internal burden sharing, through the fixing of National Action Plans that will take into account the Member States' varying domestic energy mixes.

The Conclusions contain a paragraph dedicated to nuclear energy that covers three points:

- the promotion of broad-ranging discussions with stakeholder representatives on the opportunities and risks of nuclear energy (European Nuclear Energy Forum)
- Its contribution to meeting growing concerns about security of energy supply and CO_2 emissions
- the need for continued improvements in the field of nuclear safety and radioactive waste management (support for R & D on waste management under the FP7 and the potential creation of a High-level Group on nuclear safety and waste management)

Within this context, the European Commission, with the support of MEPs, Member States and the European nuclear industry, recently proposed the creation of a European Nuclear Energy Forum (ENEF) to promote discussions with stakeholders. This forum will promote a constructive and transparent dialogue and encourage a forward-looking analysis of key issues relating to the future of nuclear energy, including lifetime extensions of existing plants and nuclear new build.

You can read the Council conclusions, and FORATOM's analysis of the Council's conclusions.

17 July 2007: Nuclear Safety Group Officially Launched by the

Commission The European Commission, on 17 July, set up a High-Level Group on nuclear safety and waste management. The creation of the group was proposed by the Commission in its January 2007 draft Nuclear Illustrative Programme and was endorsed by the March European Council. The High-Level group is in charge of analysing matters such as the safety and decommissioning of nuclear installations and management of spent nuclear fuel and radioactive waste.

The members of the group are senior nuclear safety regulators from member states. Countries with and without nuclear power equally take part in the group. The work of the group has to be carried out in coherence with other groups such as the newly created Nuclear Energy Forum.

21 September: New Platform for Sustainable Nuclear Research Launched by EC

On 21 September 2007, in Brussels, the Sustainable Nuclear Energy Technology Platform (SNETP) was launched by the European Commission. The SNETP aims to facilitate closer integration between researchers and industry to enable the definition and implementation of a Strategic Research Agenda (SRA) and corresponding Deployment Strategy (DS), as well as to maintain Europe's R&D leadership in the nuclear research sector. An EC strategic document entitled SNETP: A Vision Report was published. This report, which was compiled with the support of industry, research centres and the Euratom Scientific and Technical Committee, underlines the special contribution made by nuclear energy to ensuring security of energy supply, promoting competitiveness and fighting climate change. It also provides a roadmap for the creation of the SRA, highlighting the start-up, by 2020, of a new breed of fast reactors (Generation IV), advanced recycling processes and the production of alternative fuels, like hydrogen. The report also stresses the need for increased resources for education and training in nuclear engineering.

For further information, you can consult the press release of the European Commission and the SNE-TP website.

12 October: First meeting of the High Level Group on Safety and Waste Management

The first meeting of the European Commission (EC)'s High Level Group on Nuclear Safety and Waste Management took place on 12 October. The creation of the group, endorsed by the March European Council, follows on from the Commission's Nuclear Illustrative Programme, adopted last week. The main goal of the Group will be to help the Commission develop European rules regarding the safety of nuclear installations and the safe management of spent fuel and radioactive waste. It is also expected to work in collaboration with other newly-created bodies, the European Nuclear Energy Forum (ENEF) and the Sustainable Nuclear Energy- Technology Platform (SNE-TP).

The group composed of 27 national senior officials from national regulatory or nuclear safety authorities, and their deputies as well as a Commission representative elected Andrej Stritar, the Slovenian Nuclear Safety Administration Director, as interim Chairperson until the election of a permanent one expected next January.

Every two years, the Group will have to submit to the Commission a report that will later be transmitted to the Council and to Parliament. It should also identify safety issues, ensure coherent action by national authorities and make recommendations for EU action.

The creation of the Group shows once again that nuclear power is increasingly gathering momentum within the European Union. During a press conference that followed the meeting, the Energy Commissioner, Andris Piebalgs acknowledged that nuclear was "here to stay". He added that it needs to be safe and that governments need to "make up their minds as soon as possible" in order to create certainty for investors.
For further information, please read the press release of the European Commission, the article of NucNet and the article of Euractiv.

24 October: Publication of the European Parliament Reul Report

The European Parliament's (EP) adopted the Reul Report entitled Conventional Energy Sources and Energy Technology. The Report shows that there is growing political consensus that nuclear energy "is indispensable if Europe's medium and long-term energy needs are to be met." The report, which was proposed by MEP Herbert Reul (EPP-ED, Germany) includes a section dedicated to nuclear energy that is based upon an EC Communication on the PINC. It was adopted with a majority of 509 votes for, 153 against and 30 abstentions, with most of the anti-nuclear amendments having been rejected.

The EP's adoption yesterday of the Reul Report by an overwhelming majority is highly significant because it constitutes the first time that the EP has explicitly endorsed nuclear energy's role as "the largest low-carbon energy source in Europe" and a key component in Europe's future energy mix.

For further information, please read the press release of the European Parliament, the text of the report as adopted by the European Parliament is available on the same page.

29-30 October: First meeting of the SNE-TP

Following the highly successful launch of the Sustainable Nuclear Energy Technology Platform on 21st September, the FORATOM Secretariat has been helping define the structure and rules of governance of the Platform and participated in the inaugural meetings of the Executive Committee and Governing Board on 29th and 30th October respectively. The Governing Board, which will meet twice per year, comprises approximately 10 industrial members, 10 from research organisations, 2 from TSOs, ENEN – the nuclear education network, ENS and FORATOM. FORATOM is represented by President Eduardo Gonzalez. The Executive Committee is smaller and will meet more often. FORATOM is represented on this latter group by Director General Santiago San Antonio. The first significant task of the Platform will be to write a Strategic Research Agenda by the end of 2008. The aim will be to define a roadmap for all European nuclear fission research until the year 2040. A sub-group will be established to undertake this work, led by SCK/CEN. It has been proposed to the Commission that the Chairman of the SNETP Governing Board, Mr. Philippe Pradel of CEA, should participate in ENEF.

For further information, you can consult the SNE-TP website.

22 November: Publication of the SET-Plan

On 22 November, the European Commission published the Strategic Energy Technology Plan (SET-Plan). The plan aims at increasing the use of low-carbon technologies to meet the targets set up during the latest Spring Council in March of 20% CO_2 emission reduction and 20% renewable increase by 2020. The "clean" technologies include not only renewables, but also sustainable nuclear fission and carbon capture and sequestration (CCS). The document recognizes officially that nuclear power is a key part of EU energy policy and contributes along with other low-CO_2 energy sources to forging EU's low-carbon economy.

To achieve EU's energy goals, the plan proposes measures in order to increase effective co-ordination in research at EU level:

- A European Community Steering Group on Strategic Energy Technologies. Chaired by the Commission, the group will be "composed of high level government representatives from Member States."
- European Industrial Initiatives for renewables but also for nuclear fission, CCS and electricity grids. The initiatives will be funded "in different ways", such as public-private partnerships, or "joint programming by coalitions of those interested Member States".
- A European Research Alliance bringing together more closely universities and institutes for energy;
- A new Energy Technology Information System, and;
- Organisation in the first half of 2009 of a European Energy Technology Summit.

For further information, please go to the website of DG Tren and read the Commission press release: European Commission proposes a plan to accelerate energy technologies for a low-carbon future, the Commission communication: Towards a low carbon future – A European Strategic Energy Technology Plan, and the SET Plan Technology Map.

26-27 November: European Nuclear Energy Forum's first Meeting in Bratislava

The first meeting of the European Nuclear Energy Forum (ENEF), which aims to promote an inclusive, transparent and non-ideological debate on nuclear between all the relevant stakeholders, took place in Bratislava on 26-27 November 2007. The meeting gathered over 50 participants and featured high level speakers such as the Prime Ministers of Slovakia and Czech Republic, Mr. Fico and Mr. Topolanek respectively; the President of the European Commission, Mr. Barroso, and the Energy Commissioner, Mr. Piebalgs.

The Forum will establish three working groups that will probe into the opportunities of nuclear (financing, technologies, new build), the risks of nuclear (safety, security, waste management), and information and transparency (public acceptance). They will draft proposals in order to enable ENEF to provide a roadmap for the continued development of nuclear energy in the European Union. The working groups will meet

for the first time end of January 2008 and are expected to meet twice before the next meeting of ENEF that is scheduled on 22 & 23 May 2008 in Prague. ENEF should eventually provide advice to European policy makers, mainly in the European Institutions on security of energy supply, incentives for investment, EU legislative issues, public opinion, education and training, R&D and knowledge management, safety and waste management. It is also expected to work in collaboration with other newly-created bodies the Sustainable Nuclear Energy- Technology Platform (SNE-TP), and the High Level Group on safety and Waste management (HLG). ENEF gathers for the first time a broad range of stakeholders – the nuclear industry, public authorities, the financial community and various sections of civil society.- in a debate on the future of nuclear energy in Europe.

For further information, please consult the ENEF section of the FORATOM website and the ENEF section of the Commission website.

---

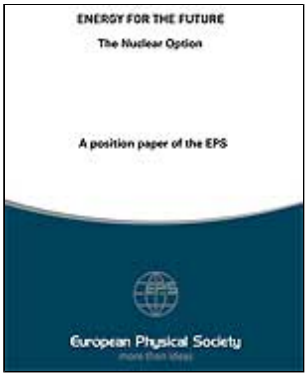
http://www.euronuclear.org/e-news/e-news-19/energy-for-the-future.htm

ENS WORLD NEWS

Energy for the Future

The Nuclear Option

A position paper of the European Physical Society



download Report

---

http://www.euronuclear.org/e-news/e-news-19/uk-decision.htm

ENS WORLD NEWS

UK Takes Final Decision to Build New Nuclear Plants

The British government announced on 10 January that a new generation of nuclear power plants will be built in the UK to contribute to the promotion of a “secure, diverse and low-carbon energy mix.” The decision to re-invest in nuclear energy as an essential part of that energy mix is the main conclusion to emerge from the Nuclear White Paper that the government published.

In a statement to the British Parliament outlining the conclusions of the Nuclear White Paper, Business Secretary, John Hutton, said that the expansion of Britain’s nuclear sector should “.play a role in providing the UK with clean, secure and affordable energy that is in our country’s vital long-term interest.” He launched the process by inviting companies to submit plans for the construction and operation of a new fleet of nuclear power plants.

Proposed new energy legislation also published contains clauses to ensure adequate funding provision is made by potential developers of new nuclear units for the full costs of decommissioning and their full share of waste management costs.

The White Paper is a response to the consultation that took place from 23 May to 10 October 2007. The results of the consultation were also published on the same day.

For further information, please consult the press release of the British government’s Department for Business Enterprise & Regulatory Reform, the press release of the NIA (the Nuclear Industry Association, UK) and the Analysis of consultation responses and the consultation website.

http://www.euronuclear.org/e-news/e-news-19/nucnet-news.htm

ENS WORLD NEWS

NUCNET NEWS

THE WORLD'S NUCLEAR NEWS AGENCY

UK Gives Green Light To New Nuclear Plants

10 Jan (NucNet): The British government has given the go-ahead for the possible construction of a new generation of nuclear power plants in the UK.

Energy Secretary John Hutton said he is inviting energy companies to bring forward plans to build and operate new nuclear power plants.

"Giving the go ahead today that new nuclear power should play a role in providing the UK with clean, secure and affordable energy is in our country's vital long term interest," said Mr Hutton, who announced the decision in parliament.

In a White Paper (policy document) on nuclear energy published to coincide with the announcement, the government says new nuclear power plants should have a role to play in the UK's future energy mix alongside other low carbon sources.

The White Paper says energy companies should be allowed the option of investing in new nuclear power plants, and the government should take "active steps" to facilitate this.

Those steps include carrying out a strategic siting assessment and simplifying the planning process for new nuclear build.

The government also said it would bring forward legislation to ensure that the framework for funding decommissioning and waste management liabilities is clear and properly ensures that each nuclear operator meets its costs.

Proposed new energy legislation also published today contains clauses to ensure adequate funding provision is made by potential developers of new nuclear units for the full costs of decommissioning and their full share of waste management costs.

In the White Paper, prime minister Gordon Brown says nuclear is a "tried and trusted technology" and "more than ever before has a key role to play".

In May 2007 the government launched a consultation to examine nuclear energy.

Today's White Paper is a response to that consultation.

The White Paper and other documents related to today's announcement can be downloaded from the government's nuclear energy website (nuclearpower2007.direct.gov.uk).

Davos Report Proposes 'Nuclear Fuel Insurance Fund'

24 Jan (NucNet): Proposals for financial markets to support an international 'nuclear fuel insurance fund', which would guarantee supplies and discourage the spread of enrichment facilities, are included in a new report to the World Economic Forum (WEF) meeting* in Davos, Switzerland.

The report, 'Global Risks 2008', says that as "a non-carbon-based energy source… nuclear technology has a number of attractions in an era of uncertainty".

However, the report warns that some countries considering domestic nuclear energy programmes "fear that they could be blocked in the future by the six states which currently produce enriched uranium on a commercial basis: France, Germany, the Netherlands, Russia, the UK and the US".

This could encourage more states to build enrichment facilities, a move which would "shatter" the international structures governing nuclear technologies and lead to increased risks of proliferation.

The report says an innovative concept known as 'insure to assure' has been proposed by a joint team from the Wharton Business School and Harvard's Kennedy School. The proposed solution – complementary to the efforts of the International Atomic Energy Agency (IAEA) and others – would create a partnership between financial industries and governments to create the world's first international nuclear fuel insurance fund.

Premiums collected from member countries would be deposited in a mutual insurance company (MIC), which would use some of the money to build a cash reserve and to purchase supply options. Residual funds would go to a consortium of insurers and re-insurers that would provide layered financial protection to all participating countries.

"IAEA member governments would serve as a financial backstop for the consortium. In the event of a fuel disruption, the MIC would exercise its options and work with fuel suppliers, energy producers and transporters to arrange timely fuel delivery or alternative electricity purchases off the energy grid (if available)," the report says. The insurance consortium would compensate member countries and others involved in replacing fuel for any loss of efficiency as contractually agreed.

According to the report, a number of "stakeholders" are now studying the proposals which would "bring together two worlds that rarely talk to one another: the worlds of international security and international finance".

EU's Solana Backs 'World Nuclear Fuel Bank' Proposals

31 Jan (NucNet): The EU's foreign policy chief has reiterated calls for an international nuclear fuel bank to discourage countries from building their own enrichment facilities.

Javier Solana, the EU's high representative for the Common Foreign and Security Policy and Secretary-General of the Council of the European Union, told members of the European Parliament yesterday: "We need to find ways of reassuring countries that they can get nuclear fuel without developing their own enrichment capacities."

Mr Solana's comments came as the European Parliament debated nuclear activities in Iran. Politically, he said Iran had "elements of democracy that are not visible in other Middle East countries". While this was an imperfect democracy, it was better than nothing, therefore "we should engage with its parliamentarians".

"None of us have a problem with an Iranian civil programme, in fact, we are offering to help… but we need to ensure that their intentions are purely peaceful," he added.

Mr Solana called for an international enrichment centre to be established when he addressed a conference in Madrid last year. He is among a number of world leaders and top diplomats who have expressed interest in the idea.

The International Atomic Energy Agency's director-general, Mohamed ElBaradei, has proposed multilateral management and control of the nuclear fuel cycle, with the IAEA acting as facilitator and guarantor of a fuel bank.

---

http://www.euronuclear.org/e-news/e-news-19/Member-Societies.htm

MEMBER SOCIETIES

Member Societies

Links to Member Societies

Austrian Nuclear Society http://www.oektg.at	**Belgian Nuclear Society** http://www.bnsorg.be
British Nuclear Energy Society http://www.bnes.org.uk	**Bulgarian Nuclear Society** http://www.bgns.bg
Croatian Nuclear Society http://www.cro-nuclear.hr	**Czech Nuclear Society** http://www.csvts.cz/cns
Finnish Nuclear Society http://www.ats-fns.fi	**French Nuclear Energy Society (SFEN)** http://www.sfen.org
German Nuclear Society (KTG) http://www.ktg.org	**Hungarian Nuclear Society** http://nukinfo.reak.bme.hu/
The Israel Nuclear Society E-mail: meins@tx.technion.ac.il	**Italian Nuclear Association** http://www.assonucleare.it E-mailt: info@assonucleare.it
Lithuanian Nuclear Energy Association E-mail: saek@ktu.lt	**Netherlands Nuclear Society** http://www.kerntechniek.nl
Nuclear Society of Russia E-mail: agagarin@kiae.ru	**Nuclear Society of Serbia** http://nss.vin.bg.ac.yu/
Nuclear Society of Slovenia	**Polish Nuclear Society**

http://www.drustvo-js.si	http://www.nuclear.pl
Romanian Nuclear Energy Association (AREN) http://www.aren.ro	**Slovak Nuclear Society** http://www.snus.sk
Spanish Nuclear Society http://www.sne.es	**Swedish Nuclear Society** http://www.karnteknik.se
Swiss Nuclear Society http://www.sns-online.ch	

http://www.euronuclear.org/e-news/e-news-19/Corporate-Members.htm

CORPORATE MEMBERS

Links to ENS Corporate Members

Aare-Tessin AG (ATEL) link	Advanced Measurement Technology Inc. link
Andritz AG link	Ansaldo Nucleare S.p.A link
AREVA NP link	AREVA NP GmbH E-mail: unternehmenskommunikation @areva.com link
Atomic Energy Council (AEC) link	BKW FMB Energie AG link
BNFL link	Belgatom link
Centralschweizerische Kraftwerke (CKW) link	Chubu Electric Power Co. link
Comisión Chilena de Energía Nuclear link	CCI AG (formerly Sulzer Thermtec Ltd) link
Colenco Power Engineering AG, Nuclear Technology Department link	Commissariat à l'Energie Atomique (CEA), Nuclear Energy Division link
Design Bureau "Promengineering" link	Eckert & Ziegler Isotope Products GmbH link
NV Elektriciteits-Produktiemaatschappij Zuid-Nederland EPZ (Electricity Generating Co. Ltd in the Southern Netherlands) link	Energie Ouest-Suisse (EOS) E-mail: guillaume.gros@eosholding.ch
E.O.N Kernkraft GmbH link	Euro Nuclear Services BV E-mail: ens@unitech.ws link
Electrabel, Generation Department link	Electricité de France (EDF), Communication Division link
ENUSA Industrias Avanzadas SA link	EXCEL Services Corporation link
Framatome ANP (Advanced Nuclear Power) E-mail: FRinfo@framatome-anp.com link	Framatome ANP, Inc E-mail: USinfo@framatome-anp.com link
GE Nuclear Energy peter.wells@gene.ge.com	Genitron Instruments GmbH link and link
Holtec International link	IEA of Japan Co. Ltd link
Institut National des Radioéléments, E-mail: generalmail@ire.be	Japan Electric Power Information Center (JEPIC) link
Jozef Stefan Institute link	Kernkraftwerk Gösgen-Däniken AG link
Kernkraftwerk Leibstadt AG (KKL),	Elektroinstitut Milan Vidmar

link	E-mail: bogo.pirs@eimv.si
L-3 Communications MAPPS Inc. link	Microfiltrex - a Division of Porvair Filtration Group Ltd E-mail: info@porvairfiltration.com link
Nordostschweizerische Kraftwerke (NOK) link	NRG Arnhem link
NRG Petten link	Nuklearna Elektrarna Krsko link
NUKEM GmbH link	Paks Nuclear Power Plant Ltd link
Paul Scherrer Institute link	Polimaster Ltd link
RADOS Technology Oy link	Siempelkamp Nukleartechnik GmbH E-mail: wolfgang.steinwarz@ siempelkamp.com link
SKB (Swedish Nuclear Fuel and Waste Management Company) E-mail: info@skb.se link	SPE Atomtex link
Studsvik AB link	Studiecentrum voor Kernenergie, Centre d'Etude de l'Energie Nucléaire SCK/CEN link
Synatom E-mail: mailmaster@synatom.com	Taiwan Atomic Energy Council (AEC) link
Taiwan Power Company (Taipower) link	Technicatome link
"Technoatomenergo" Close Joint-Stock Company E-mail: tae@arminco.com	Teollisuuden Voima Oy / Industrial Power Company Ltd (TVO) link
Tokyo Electric Power Co. (London Office) E-mail: momma@tepco.co.uk	UNESA E-mail: nuclear@unesa.es link
Urenco Limited link	USEC Inc. link
Vattenfall AB E-mail: dag.djursing@vattenfall.com link	VTT Nuclear link
Hans Wälischmiller GmbH link	World Nuclear Association (WNA), link
Westinghouse Electric Company link	World Association of Nuclear Operators (WANO), link

http://www.euronuclear.org/e-news/e-news-19/editorial.htm

Editorial Staff:

Mark O'Donovan, Editor-in-Chief

Contributors to this Issue:

David Bonser (ENS)
Frank Deconinck (ENS)
Kirsten Epskamp (ENS)
Milos Lascek (Slovak YGN)
Todor Madolev (BgNS)
Gaston Meskens (SCK-CEN)
Fernando Naredo (Westinghouse)
Frigyes Reisch, (KTH)
David Dalton (NucNet)
Judit Silye (HNS)
Andrew Teller (Areva)

Realisation:

Marion Brünglinghaus

Rue de la Loi 57, BE-1040 Brussels
Phone +32 2 505 30 50 - Fax: +32 2 502 39 02
E-mail: info@euronuclear.org - http://www.euronuclear.org